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English for IT:

part 3

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PREFACE

Настоящее учебное пособие включает актуальные тексты учебно-познавательной тематики для магистрантов специальности «Прикладная математика и информатика».

Целью данного пособия является формирование навыка чтения и перевода научно-популярных и собственно научных текстов, а также развитие устной научной речи обучающихся.

Пособие состоит из 4 разделов, рассматривающих проблемы и достижения в сфере информационных технологий в современном мире. Каждый из них содержит аутентичные материалы (источники: *Aeon*, *BBC Future*, *Nautilus*, *The Guardian*) и упражнения к ним.

Пособие может успешно использоваться как для аудиторных занятий, так и для внеаудиторной практики.

1. Endless fun: how would a virtual reality afterlife change the way we live in the real life?

Part 1

Exercise I.

Say what Russian words help to guess the meaning of the following words: scans, unique, data, emotions, copy, version, café, neurons, realistic, electrical.

Exercise II.

Make sure you know the following words and word combinations:

virtual reality, human genome, to wire up, basic premise, brain scanning, a matter of time, afterlife, disturbing, fuzzy, premise, off-chance, crass, to withhold, quirk

Endless fun: how would a virtual reality afterlife change the way we live in the real life?

The question is not whether we can upload our brains onto a computer, but what will become of us when we do.

Imagine a future in which your mind never dies. When your body begins to fail, a machine scans your brain in enough detail to capture its unique wiring. A computer system uses that data to simulate your brain.

It won't need to replicate every last detail, it will strip away the irrelevant physical structures, leaving only the essence of the patterns. And then there is a second you, with your memories, your emotions, your way of thinking and making decisions, translated onto computer hardware as easily as we copy a text file these days. That second version of you could live in a simulated world and hardly know the difference. You could walk around a simulated city street, feel a cool breeze, eat at a café, talk to other simulated people, play games, watch movies, enjoy yourself. Pain and disease would be programmed out of existence. If you're still interested in the world outside your simulated playground, you could Skype yourself into board meetings or family Christmas dinners. Recently, these ideas have caught on outside fiction. The Russian multimillionaire Dmitry Itskov made the news by proposing to transfer his mind into a robot, thereby achieving immortality. Only a few months ago, the British physicist Stephen Hawking speculated that a computer-simulated afterlife might become technologically feasible. (1)

It is tempting to ignore these ideas as just another science-fiction fantasy. But something about it won't leave me alone. I am a neuroscientist. I find myself asking, given what we know about the brain, whether we really could upload someone's mind to a computer. And my best guess is: yes, almost certainly. That raises a host of further questions, not least: what will this technology do to us psychologically and culturally? It will utterly transform humanity, probably in ways that are more disturbing than helpful. It will change us far more than the internet did, though perhaps in a similar direction. Simulating a whole network of interacting neurons, each one with truly realistic electrical and chemical properties, is beyond current technology. Even if the

chances of all this coming to pass were slim, the implications are so dramatic that it would be wise to think them through seriously. But I'm not sure the chances *are* slim. In fact, the more I think about this possible future, the more it seems inevitable. So what is the right level of detail to copy if you want to capture a person's mind? Of all the biological complexity, what patterns in the brain must be reproduced to capture the information and the consciousness? One of the most common suggestions is that the pattern of connectivity among neurons contains the essence of the machine. Simple computer models of neurons are capable of enormous complexity. Such network models have been around for decades, and they differ in interesting ways from standard computer programs. For one thing, they are able to learn, as neurons adjust their connections to each other. They can solve problems that are difficult for traditional programs, and are particularly good at taking noisy input and compensating for the noise. Give a neural net a fuzzy, spotty photograph, and it might still be able to categorise the object depicted, filling in the gaps in the image — something called pattern completion. Despite these remarkably human-like capacities, neural network models are not yet the answer to simulating a brain. Nobody knows how to build one at an appropriate scale. Some notable attempts are being made, but even if computers were powerful enough to simulate 100 billion neurons — and computer technology is pretty close to that capability — the real problem is that nobody knows how to wire up such a large artificial network. Instead of trying to wire up an artificial brain from first principles, or training a neural network over some absurdly long period until it becomes human-like, why not copy

the wiring already present in a real brain? In 2005, two scientists, Olaf Sporns, professor of brain sciences at Indiana University, and Patric Hagmann, neuroscientist at the University of Lausanne, independently coined the term ‘connectome’ to refer to a map or wiring diagram of every neuronal connection in a brain. By analogy to the human genome, which contains all the information necessary to grow a human being, the human connectome in theory contains all the information necessary to wire up a functioning human brain. If the basic premise of neural network modelling is correct, then the essence of a human mind is contained in its pattern of connectivity. Your connectome, simulated in a computer, would recreate your conscious mind. Could we ever map a complete human connectome? Well, scientists have done it for a roundworm. They’ve done it for small parts of a mouse brain. A very rough, large-scale map of connectivity in the human brain is already available. The National Institutes of Health in the US is currently funding the Human Connectome Project, an effort to map a human brain in as much detail as possible. I admit to a certain optimism toward the project. The technology for brain scanning improves all the time. High-resolution scans of volunteers are revealing the connectivity of the human brain in more detail than anyone ever thought possible. Other, even better technologies will be invented. It is only a matter of time, and a timescale of five to 10 decades seems about right. (2)

Of course, nobody knows if the connectome really does contain all the essential information about the mind. Some of it might be encoded in other ways. Maybe certain other aspects of the brain need to be scanned and copied to make a high-quality simulation. That won’t be soon enough for some of us. One of the basic facts about people is that they

don't like to die. They don't like their loved ones or their pets to die. Some of them already pay enormous sums to freeze themselves, or even (somewhat gruesomely) to have their heads frozen on the off-chance that a future technology will successfully revive them. And as the technology advances and the public starts to see the possibilities, the incentives will increase. One might say (at risk of being crass) that the afterlife is a natural outgrowth of the entertainment industry. Think of the fun to be had as a simulated you in a simulated environment. You could go on a safari through Middle Earth. You could live on a simulation of Mars. You could move easily from one entertainment to the next. You could keep in touch with your living friends through all the usual social media. I have heard people say that the technology will never catch on. People won't be tempted because a duplicate of you, no matter how realistic, is still not you. But I doubt that such concerns will have much of an impact once the technology arrives. If you die and are replaced by a really good computer simulation, it'll just seem to you like you entered a scanner and came out somewhere else. You'll be missing some memories. If you had your annual brain-backup, say, eight months earlier, you'll wake up missing those eight months. But you will still feel like you, and your friends and family can fill you in on what you missed.

(3)

And then what? Well, such a technology would change the definition of what it means to be an individual and what it means to be alive. For starters, it seems inevitable that we will tend to treat human life and death much more casually. People will be more willing to put themselves and others in danger. Then again, how will we view the sanctity of *digital* life? Will simulated people, living in an artificial

world, have the same human rights as the rest of us? Is it ethical to experiment on simulated consciousness? Can a scientist take a try at reproducing Jim, make a bad copy, casually delete it, and then try again until he gets a satisfactory version? This is just the tip of a nasty philosophical iceberg we seem to be sailing towards. In many religions, a happy afterlife is a reward. In an artificial one, due to inevitable constraints on information processing, spots are likely to be competitive. Who decides who gets in? Do the rich get served first? Is it merit-based? Will it be withheld as a punishment? Will a special torture version of the afterlife be constructed for severe punishment? Then there are the issues that will arise if people deliberately run multiple copies of themselves at the same time, one in the real world and others in simulations. The nature of individuality, and individual responsibility, becomes rather fuzzy when you can literally meet yourself coming the other way. What, for instance, is the social expectation for married couples in a simulated afterlife? Do you stay together? Do some versions of you stay together and other versions separate? So much for the self. What about the world? Will the simulated environment necessarily mimic physical reality? That seems the obvious way to start out, after all. Create a city. Create a blue sky, a pavement, the smell of food. Sooner or later, though, people will realise that a simulation can offer experiences that would be impossible in the real world. To give just one example, it might include any number of dimensions in space and time. The real world looks to us to have three spatial dimensions and one temporal one, but, as mathematicians and physicists know, more are possible. It's

already possible to programme a video game in which players move through a maze of four spatial dimensions. (4)

All of the changes described above, as exotic as they are and disturbing as some of them might seem, are in a sense minor. They are about individual minds and individual experiences. If uploading were only a matter of exotic entertainment, then it would be of limited significance. If simulated minds can be run in a simulated world, then the most transformative change, the deepest shift in human experience, would be the loss of individuality itself — the integration of knowledge into a single intelligence, smarter and more capable than anything that could exist in the natural world. You wake up in a simulated welcome hall in some type of simulated body. What do you do? Maybe you take a walk and look around. Maybe you try the food. Maybe you play some tennis. Maybe go watch a movie. But sooner or later, most people will want to reach for a cell phone. Send a tweet from paradise. Text a friend. Get on Facebook. Connect through social media. But here is the quirk of uploaded minds: the rules of social media are transformed. In the real world, two people can share experiences and thoughts. But lacking a USB port in our heads, we can't directly merge our minds. In a simulated world, that barrier falls. A simple app, and two people will be able to join thoughts directly with each other. Why not? It's a logical extension. We humans are hyper-social. We love to network. We already live in a half-virtual world of minds linked to minds. In an artificial afterlife, given a few centuries and few tweaks to the technology, what is to stop people from merging into combinations of wisdom, experience, and memory beyond anything possible in biology? Two minds, three

minds, 10, pretty soon everyone is linked mind-to-mind. The concept of separate identity is lost. The need for simulated bodies walking in a simulated world is lost. The need for simulated food and simulated landscapes and simulated voices disappears. Instead, a single platform of thought, knowledge, and constant realisation emerges. What starts out as an artificial way to preserve minds after death gradually takes on an emphasis of its own. Real life, our life, shrinks in importance until it becomes a kind of larval phase. Whatever experiences you might have had during your biological existence, they would be valuable only if they can be added to the longer-lived and much more sophisticated machine. I am not talking about utopia. To me, this prospect is three parts intriguing and seven parts horrifying. I am genuinely glad I won't be around. This will be a new phase of human existence that is just as messy and difficult as any other phase has been, one as alien to us now as the internet age would have been to a Roman citizen 2,000 years ago; as alien as Roman society would have been to a hunter-gatherer 10,000 years before that. Such is progress. We always manage to live more-or-less comfortably in a world that would have frightened and offended the previous generations. (5)

Adapted from Aeon.

Exercise III.

Find paragraphs, dealing with the following: genome, premise, mouse brain, large-scale, simulation, pets, gruesomely, crass, larval, hunter-gatherer

Exercise IV.

Fill in the gaps according to the text.

1. The Russian multimillionaire Dmitry Itskov by proposing to transfer his mind into a robot, thereby achieving immortality.
2. Only a few months ago, the American physicist Stephen Hawking speculated that a computer-simulated afterlife might become
3. computer models of neurons are capable of enormous complexity.
4. Give a neural net a fuzzy, spotty photograph, and it might still be able to categorise the object depicted, filling in the gaps in the image — something called completion.
5. In 2000, two scientists, Olaf Sporns, professor of brain sciences at Indiana University, and Patric Hagmann, neuroscientist at the University of Lausanne, independently ‘connectome’ to refer to a map or wiring diagram of every neuronal connection in a brain.
6. Your connectome, simulated in a computer, would your conscious mind.
7. The National Institutes of Health in the US is currently funding the Human Connectome Project, an effort to map a human brain in as possible.
8. The real world looks to us to have three spatial and one temporal one, but, as mathematicians and physicists know, more are possible.
9. It’s already possible to programme a video game in which players move through of four spatial dimensions.
10. We humans are..... .

Exercise V.

Make up sentences of your own with the following word combinations:

virtual reality, real life, human genome, to wire up, human brain, basic premise, to simulate, a matter of time, afterlife.

Exercise VI.

Determine whether the statements are true or false. Correct the false statements:

1. The Ukrainian multimillionaire Dmitry Itskov made the news by proposing to transfer his mind into a robot, thereby achieving immortality.
2. Only a few months ago, the American physicist Stephen Hawking speculated that a computer-simulated afterlife might become technologically feasible.
3. Complex computer models of neurons are capable of enormous complexity.
4. In 2000, two scientists, Olaf Sporns, professor of brain sciences at Indiana University, and Patric Hagmann, neuroscientist at the University of Lausanne, independently coined the term 'connectome' to refer to a map or wiring diagram of every neuronal connection in a brain.
5. By analogy to the human genome, which contains all the information necessary to grow a human being, the human connectome in theory contains all the information necessary to wire up a functioning human brain.
6. Your connectome, simulated in a computer, would recreate your conscious mind.
7. A very rough, large-scale map of connectivity in the human brain is not available.

8. The National Institutes of Health in the US is currently funding the Human Connectome Project, an effort to map a human brain in as much detail as possible.
9. The technology for brain scanning improves all the time.
10. High-resolution scans of volunteers are revealing the connectivity of the human brain in more detail than anyone ever thought possible.

Exercise VII .

Match the words to the definitions in the column on the right:

entertainment	a result or development
larval	shows, films, television, or other performances or activities that entertain people, or a performance of this type
mind	a form of an insect or an animal such as a frog that has left its egg but is not yet completely developed
simulate	can be done or seen using a computer and therefore without going anywhere or talking to anyone
genome	the state of things as they are, rather than as they are imagined to be
premise	the complete set of genetic material of a human, animal, plant, or other living thing
virtual	an idea or theory on which a statement or action is based
afterlife	to do or make something that looks real but is

	not real
outgrowth	the part of a person that makes it possible for him or her to think, feel emotions, and understand things
reality	the life, for example in heaven, that some people believe begins after death

Exercise VIII.

Summarize the article “Endless fun: how would a virtual reality afterlife change the way we live in the real life?”

Part 2

Exercise I.

Identify the part of speech the words belong to.

virtual, reality, human, information, neural, correct, connectivity, conscious, available.

Exercise II.

Form adverbs from the following words:

wise, inevitable, consciousness, traditional, good, appropriate, powerful, close, artificial, necessary.

Exercise III.

Find synonyms to the following words. Translate them into Russian: virtual, real, necessary, to grow, to contain, premise, correct, to simulate, conscious.

Exercise IV .

Find antonyms to the following words. Translate them into Russian:

reality, necessary, to correct, complete, rough, available, possible, to admit.

Exercise V.

Match the words to make word combinations:

large-scale	Institute
essential	scanning
real	information
conscious	map
National	genome
basic	brain
virtual	life
human	premise
mouse	mind
brain	reality

Exercise VI.

QUIZ (Artificial Intelligence)

The holy grail of computing is creating a computer that can think like a human. The computing world has made great strides but that goal is still elusive.

1) Which man is credited with coining the term 'artificial intelligence' in 1955 and is considered one of the early pioneers in the field?

A. John McCarthy

B. L. Ron Hubbard

C. Isaac Asimov

D. Alan Turing

2) Which US government department was a major early funder of artificial intelligence research for its own ulterior motives?

A. Department of Defense

B. Department of the Interior

C. National Air and Space Administration

D. Department of Commerce

3) What was the trembling name of the first general-purpose mobile robot that employed AI and was developed by the Artificial Intelligence Center of Stanford Research Institute in the late 1960s?

A. Shakey the Robot

B. Nervous Nelly

C. Unimate

D. PUMA

4) One of the early artificial intelligence programming languages was one that sounds like it might have a speech impediment. Which language is this?

A. Linux programming language

B. Stutter programming language

C. Lisp programming language

D. Fortran programming language

5) Computer games employ a form of artificial intelligence that mimics human decision-making capabilities. What is the name for these 'skillful' systems?

A. Logic systems

B. Equalization systems

C. Empirical systems

D. Expert systems

6) One of the biggest problems still facing artificial intelligence researchers is the human ability to think and reason intuitively because this cannot yet be duplicated in a computer environment.

A. True

B. False

2. Digital star chamber

Part 1

Exercise I.

Say what Russian words help to guess the meaning of the following words: to ignore, qualifications, infancy, corporation, journalist, platform, interface

Exercise II.

Make sure you know the following words and word combinations.

Court of Star Chamber, fraudulent, undisclosed, disposable, to parse, obscure, owe, accountable, to have teeth, to blackball, hidden from plain view, unravel, to make decisions, to sort the desirable from the disposable, to be treated with disdain.

Digital star chamber

Algorithms are producing profiles of you. What do they say? You probably don't have the right to know. Online retailers live in fear of a 'Google Death Penalty' – a sudden, mysterious drop in search-engine rankings if they do something judged fraudulent by Google's spam detection algorithms. Job applicants at Walmart in the US and other large companies take mysterious 'personality tests', which process their responses in undisclosed ways. And white-collar workers face CV-

sorting software that may understate, or entirely ignore, their qualifications. (1)

The infancy of the internet is over. As online spaces mature, Facebook, Google, Apple, Amazon, and other powerful corporations are setting the rules that govern competition among journalists, writers, coders, and e-commerce firms. Various platforms are adding a code layer to occupations like driving and service work. Cyberspace is no longer an escape from the 'real world'. It is now a force governing it via algorithms: recipe-like sets of instructions to solve problems. From Google search to OkCupid matchmaking, software orders and weights hundreds of variables into clean, simple interfaces, taking us from query to solution. Complex mathematics govern such answers, but it is hidden from plain view, thanks either to secrecy imposed by law, or to complexity outsiders cannot unravel. Algorithms are increasingly important because businesses rarely thought of as high tech have learned the lessons of the internet giants' successes. Following the advice of Jeff Jarvis's *What Would Google Do*, they are collecting data from both workers and customers, using algorithmic tools to make decisions, to sort the desirable from the disposable. Companies may be parsing your voice and record when you call them, to determine whether you match up to 'ideal customer' status, or are simply 'waste' who can be treated with disdain. Algorithm advises movie studios on what scripts to buy, based on how closely they match past, successful scripts. Even winemakers make algorithmic judgments, based on statistical analyses of the weather and other characteristics of good and bad vintage years. For wines or films, the stakes are not terribly high. But when algorithms start affecting critical opportunities for employment, career

advancement, health and education, they deserve more scrutiny. US hospitals are using big data-driven systems to determine which patients are high-risk – and data far outside traditional health records is informing those determinations. IBM now uses algorithmic assessment tools to sort employees worldwide on criteria of cost-effectiveness. In government, too, algorithmic assessments of dangerousness can lead to longer sentences for convicts, or no-fly lists for travellers. In lending the average borrower could lose tens of thousands of dollars over a lifetime, thanks to wrong or unfairly processed data. (2)

This trend toward using more data, in more obscure ways, to rank and rate us, may seem inevitable. Yet the exact development of such computerised sorting methods is anything but automatic. Search engines, for example, are paradigmatic examples of algorithmic technology, but their present owe a great deal to legal interventions. European Union regulators are now trying to ensure that irrelevant, outdated, or prejudicial material does not haunt individuals’ ‘name search’ results – a critical task in an era when so many prospective employers google those whom they are considering for a job. The EU has also spurred search engines to take human dignity into account – by, for example, approving the request of a ‘victim of physical assault who asked for results describing the assault to be removed for queries against her name’. Such controversies have given rise to a movement for algorithmic accountability. Some in the business world would prefer to see the work of this community end before it has even started. Spokesmen and lobbyists for insurers, banks, and big business generally believe that key algorithms deserve the iron-clad protections of trade secrecy, so they can never be examined by outsiders. But lawyers have faced down such

stonewalling before, and will do so again. Regulators *can* make data-centric firms more accountable. But first, they need to be aware of the many ways that business computation can go wrong. The data used may be inaccurate or inappropriate. Algorithmic modelling or analysis may be biased or incompetent. In fact, however, at each stage of algorithmic decision-making, simple legal reforms can bring basic protections (such as anti-discrimination law) into a computational age. (3)

While most privacy activists focus on the collection issue, the threat posed by bad or discriminatory analysis may well be more potent. Consider a ‘likely employment success score’ that heavily weights an applicant’s race, zip code, or lack of present employment. Each of these pieces of data may be innocent, or even appropriate in the right context. Consider racism first. There is a long and troubling history of discrimination against minorities. Employment discrimination laws already ban bias, so many advocates of algorithmic decision-making say, why worry about our new technology? Discrimination in any form – personal, technological, what have you – is already banned. This is naïve at best. Algorithmic decision-making processes collect personal and social data from a society with a discrimination problem. Society abounds with data that are often simple proxies for discrimination. Consider a variable that seems, on its face, less charged: months since last job. Such data could aid employers who favour workers quickly moving from job to job – or discriminate against those who needed time off to recover from an illness. Worried about the potentially unfair impact of such considerations, some jurisdictions have forbidden employers from posting ‘help wanted’ ads telling the unemployed not to apply. But whatever its merits, what teeth will it have if employers never

see CVs excluded by an algorithm that blackballs those whose latest entry is more than a few months old? Big data can easily turn into a sophisticated tool for deepening already prevalent forms of unfair disadvantage. (4)

Law enforcers of the future could find it difficult to learn all the variables that go into employment decisions. Protected by trade secrecy, many algorithms remain impenetrable to outside observers. Governments should ensure that the algorithms they are promoting serve rather than defeat their stated purposes. In areas ranging from banking and employment to housing and insurance, algorithms may well be kingmakers, deciding who gets hired or fired, who gets a 5 per cent or 15 per cent interest rate. People need to be able to understand how they work, or don't work. The growing industry of 'predictive analytics' will object to this proposal, claiming that its ways of ranking and rating persons deserve absolute trade secrecy protection. Such intellectual property is well-protected under current law. However, the government can condition funding on the use or disclosure of the data. In the US it is time for the federal budget to reward the creation of accountable algorithmic decision-making – rather than simply paying for whatever tools its contractors come up with. We wouldn't tolerate parks studded by listening equipment that recorded every stroller's conversation. We should have similar expectations of privacy and fair treatment in the thousands of algorithmic systems government directly or indirectly funds each year. (5)

Some clinical trial recruiters have discovered that people who own minivans, have no young children, and subscribe to many cable TV channels are more likely to be obese. At least in their databases, and

perhaps in others, minivan-driving, childless, cable-lovers are suddenly transmuted into a new group – the ‘likelier obese’ – and that inference is a new piece of data created about them. An inference like this may not be worth much on its own. But once people are so identified, it could easily be combined and recombined with other lists – say, of plus-sized shoppers, or frequent buyers of fast food – that solidify the inference. A new algorithm from Facebook instantly classifies individuals in photographs based on body type or posture. The holy grail of algorithmic reputation is the most complete possible database of each individual, unifying dozens of data streams into a digital lookalike. However certain they may be about our height, or weight, or health status, it suits data gatherers to keep the classifications murky. For instance, if an employer tells you he is not hiring you because you’re a diabetic, that’s clearly illegal. But what if there is an algorithm that scores your ‘robustness’ as an employee? Even if the score is based in part on health-related information, that may be near-impossible to prove because candidates almost never know what goes into an employer’s decision not to interview them or not to give them a job. It will be much easier to regulate these troubling possibilities before they become widespread, endemic business practices. The Equal Employment Opportunity Commission (EEOC) is considering disputes stemming from employer personality tests featuring questions that seem to be looking for patterns of thought connected to mental illnesses, but unrelated to pure occupational qualifications or performance. Those investigations should continue, but in some cases, mere disclosure and analysis of algorithmic assessments is not enough to make them fair.

Rather, their use may need to be forbidden in important contexts, ranging from employment to education. But when the problems with algorithmic decision-making come to light, lawyers say, they don't understand the code and coders say, and are told, they don't understand the law. (6)

The world is full of algorithmically driven decisions. One errant or discriminatory piece of information can wreck someone's employment prospects. It is vital that citizens be empowered to see and regulate the digital databases of business giants and government agencies. Even if one believes that no information should be 'deleted' – that every slip and mistake anyone makes should be on a permanent record for ever – that still leaves important decisions to be made about the processing of the data. Algorithms can be made more accountable, respecting rights of fairness and dignity for which generations have fought. The challenge is not technical, but political, and the first step is law that empowers people to see and challenge what the algorithms are saying about us. (7)

Adapted from Aeon.

Exercise III.

Find paragraphs, dealing with the following:

recipe-like sets of instructions, OkCupid matchmaking, plain view, high tech, algorithmic tools, 'ideal customer' status, winemakers, stakes, career advancement, hospitals.

Exercise IV.

Fill in the gaps according to the text.

1.is no longer an escape from the ‘real world’.
2. mathematics govern such answers, but it is hidden from plain view, thanks either to secrecy imposed by law, or to complexity outsiders cannot unravel.
3. are increasingly important because businesses rarely thought of as high tech have learned the lessons of the internet giants’ successes.
4. may be parsing your voice and record when you call them, to determine whether you match up to ‘ideal customer’ status, or are simply ‘waste’ who can be treated with disdain.
5. Algorithm advises studios on what scripts to buy, based on how closely they match past, successful scripts.
6. Even make algorithmic judgments, based on statistical analyses of the weather and other characteristics of good and bad vintage years.
7. For wines or....., the stakes are not terribly high.
8. But when algorithms start affecting critical opportunities for....., career advancement, health and education, they deserve more scrutiny.
9. US hospitals are using big data-driven systems to determine which patients are.....– and data far outside traditional health records is informing those determinations.
10. IBM now uses algorithmic assessment tools to sort employees worldwide on criteria of

Exercise VI.

Make up sentences of your own with the following word combinations: cyberspace, recipe-like, simple interfaces, complex mathematics, to be hidden from plain view, unravel, algorithmic tools, to make decisions, to sort the desirable from the disposable, to be treated with disdain.

Exercise VII.

Determine whether the statements are true or false. Correct the false statements:

1. Cyberspace is an escape from the 'real world'.
2. Algorithms are increasingly important because businesses rarely thought of as high tech have learned the lessons of the internet giants' successes.
3. Following the advice of Jeff Jarvis's What Would Google Do, they are collecting data from both workers and customers, using algorithmic tools to make decisions, to sort the desirable from the disposable.
4. Companies may be parsing your voice and record when you call them, to determine whether you match up to 'ideal customer' status, or are simply 'waste' who can be treated with disdain.
5. Algorithm advises movie studios on what scripts to buy, based on how closely they match past, successful scripts.
6. Even winemakers make algorithmic judgments, based on statistical analyses of the weather and other characteristics of good and bad vintage years.
7. For wines or films, the stakes are terribly high.
8. But when algorithms start affecting critical opportunities for employment, career advancement, health and education, they deserve less scrutiny.
9. UK hospitals are using big data-driven systems to determine which patients are high-risk – and data far outside traditional health records is informing those determinations.
10. In government, too, algorithmic assessments of

dangerousness can lead to longer sentences for convicts, or no-fly lists for travellers.

Exercise VII .

Match the words to the definitions in the column on the right:

script	the feeling of not liking someone or something and thinking that they do not deserve your interest or respect
disdain	a person, shop, or business that sells goods to the public
mathematics	a computer program that finds information on the internet by looking for words that you have typed in
profile	of high quality and lasting value, or showing the best and most typical characteristics of a particular type of thing, especially from the past
ranking	the words of a film, play, broadcast, or speech
retailer	unwanted email, usually advertisements
fraudulent	the study of numbers, shapes, and space using reason and usually a special system of symbols and rules for organizing them
spam	a rank or level, for example in a competition
search-engine	information about a person's life, work, interests, etc. on a social networking website

vintage	dishonest and illegal
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Exercise VIII.

Summarize the article “Digital star chamber.”

Part 2

Exercise I.

Identify the part of speech the words belong to: retailer, sudden, mysterious, fraudulent, detection, to understate, entirely, vintage, complex, plain

Exercise II.

Form nouns from the following words: to describe (3), mysterious (1), physical (3), understate (1), mature (2), believe (3), complex (2), algorithmic (3), critical (3).

Exercise III.

Find synonyms to the following words. Translate them into Russian: sudden(1), mysterious (1), drop (1), ranking (1), fraudulent (1) detection(1), understate(1), entirely (1), vintage (2), mature (2).

Exercise IV.

Find antonyms to the following words. Translate them into Russian: sudden(1), mysterious (1), drop(1), fraudulent (1), escape (2), real (2), complex (2).

Exercise V.

Match the words to make word combinations:

average	world
no-fly	records

algorithmic	interfaces
vintage	borrower
statistical	lists
movie	assessments
high tech	years
simple	analyses
real	studios
health	tech

Exercise VI.

QUIZ (Strange Loops)

1) First up, in the context of computer programming what is a loop?

A. A piece of code containing a group of statements that is written once but can be executed multiple times

B. A programmer who has spent too long working and has gone a bit crazy

C. Code found at the end of the program telling it to go back to the start

D. A wire used to join two computers together

2) In many languages, including C, the body of a loop must be enclosed by...

A. Angle brackets

B. Curly braces

C. Colons

D. Inverted commas

3) Sometimes the programmer may wish the loop to stop before it has finished executing completely. What word is used in many languages, including Javascript, to end the loop early?

A. stop

B. break

C. go on

D. cease

4) When writing a loop in the Python programming language each line of the content of the loop must be indented by the same amount.

A. True

B. False

5) In the language Ruby, which command can be used to tell the program that the loop body has finished?

A. do nothing

B. stop

C. end

D. repeat

6) Instead of using a for loop to work through items in a collection the language Java has a built in method that can be used instead. What is this method called?

- A. List checker
- B. Go through
- C. Iterator
- D. For each

7) When creating a loop, the programmer usually needs to be careful that their loop does not run forever. What is the term used to describe a loop which does not stop?

- A. Neverending loop
- B. Infinite loop
- C. Idiot loop
- D. Chasing its tail loop

8) The language PHP, amongst others, has a loop known as a 'do ... while' loop. How does this differ from a regular 'while' loop?

- A. It runs the code while another section of code is executing
- B. It only works with a timer
- C. It checks the condition at the end rather than the start of the loop
- D. It gives an instruction to the programmer to get more coffee

3. What if jobs are not the solution, but the problem?

Part 1

Exercise I.

Say what Russian words help to guess the meaning of the following words: economist, character, punctuality, initiative, structure, banker, gangster, actually, official.

Exercise II.

Make sure you know the following words and word combinations.

full employment, self-discipline, income, at any rate, to pay the bills, to keep somebody away from, plausible, labour market, to play by the rules, unemployment rate, to shuffle, benefit, passing phase, dismal, dole, household income, supplement, justifiable, profound.

What if jobs are not the solution, but the problem?

Economists believe in full employment. Americans think that work builds character. But what if jobs aren't working anymore?

Work means everything to us Americans. For centuries we've believed that it builds character (punctuality, initiative, honesty, self-discipline, and so forth). We've also believed that the market in labour, where we go to find work, has been relatively efficient in allocating

opportunities and incomes. And we've believed that, even if it sucks, a job gives meaning, purpose and structure to our everyday lives – at any rate, we're pretty sure that it gets us out of bed, pays the bills, makes us feel responsible, and keeps us away from daytime TV. These beliefs are no longer plausible. In fact, they've become ridiculous, because there's not enough work to go around, and what there is of it won't pay the bills – unless of course you've landed a job as a drug dealer or a Wall Street banker, becoming a gangster either way. These days, everybody from Left to Right addresses this breakdown of the labour market by advocating 'full employment', as if having a job is self-evidently a good thing, no matter how dangerous, demanding or demeaning it is. But 'full employment' is not the way to restore our faith in hard work, or in playing by the rules, or in whatever else sounds good. The official unemployment rate in the United States is already below 6 per cent, which is pretty close to what economists used to call 'full employment', but income inequality hasn't changed a bit. Shitty jobs for everyone won't solve any social problems we now face. (1)

Don't take my word for it, look at the numbers. Already a fourth of the adults *actually employed* in the US are paid wages lower than would lift them above the official poverty line – and so a fifth of American children live in poverty. Almost half of *employed* adults in this country are eligible for food stamps. The market in labour has broken down, along with most others. Those jobs that disappeared in the Great Recession just aren't coming back, regardless of what the unemployment rate tells you – the net gain in jobs since 2000 still stands at zero – and if they do return from the dead, they'll be zombies, those

part-time or minimum-wage jobs where the bosses shuffle your shift from week to week: welcome to Wal-Mart, where food stamps are a benefit. And don't tell me that raising the minimum wage to \$15 an hour solves the problem. No one can doubt the moral significance of the movement. But at this rate of pay, you pass the official poverty line only after working 29 hours a week. The current federal minimum wage is \$7.25. Working a 40-hour week, you would have to make \$10 an hour to reach the official poverty line. What, exactly, is the point of earning a paycheck that isn't a living wage, except to prove that you have a work ethic? But, wait, isn't our present dilemma just a passing phase of the business cycle? What about the job market of the future? The measurable trends of the past half-century, and the plausible projections for the next half-century, are just too empirically grounded to dismiss as dismal science. They look like the data on climate change – you can deny them if you like, but you'll sound like a moron when you do. For example, the Oxford economists who study employment trends tell us that almost half of existing jobs, including those involving 'non-routine cognitive tasks' – you know, like *thinking* – are at risk of death by computerisation within 20 years. Meanwhile, the Silicon Valley types who give TED talks have started speaking of 'surplus humans' as a result of the same process – cybernated production. «*Rise of the Robots*», a new book that cites these very sources, is social science, not science fiction. So this Great Recession of ours – don't kid yourself, it ain't over – is a moral crisis as well as an economic catastrophe. You might even say it's a spiritual impasse, because it makes us ask what social process other than work will permit the construction of character –

or whether character itself is something we must aspire to. But that is why it's also an intellectual opportunity: it forces us to imagine a world in which the job no longer builds our character, determines our incomes or dominates our daily lives. In short, it lets us say: enough already. F*** work. (2)

Certainly this crisis makes us ask: what comes *after* work? What would you do without your job as the external discipline that organises your life – as the social imperative that gets you up and on your way to the factory, the office, the store, the restaurant, wherever you work and, no matter how much you hate it, keeps you coming back? What would you do if you didn't have to work to receive an income? And what would society and civilisation be like if we didn't have to 'earn' a living – if leisure was not our choice but our lot? Would we hang out at the local Starbucks, laptops open? Or volunteer to teach children in less-developed places? Or smoke weed and watch reality TV all day? I'm not proposing a thought experiment here. By now these are *practical* questions because there aren't enough jobs. So it's time we asked even more practical questions. How do you make a living *without a job* – can you receive income without working for it? Is it possible, to begin with and then, the hard part, is it ethical? If you were raised to believe that work is the index of your value to society – as most of us were – would it feel like cheating to get something for nothing? We already have some answers because we're all on the dole, more or less. The fastest growing component of household income since 1959 has been 'transfer payments' from government. By the turn of the 21st century, 20 per cent of *all* household income came from this source – from what is otherwise known as welfare. Without this income

supplement, *half* of the adults with full-time jobs would live below the poverty line, and *most* working Americans would be eligible for food stamps. But are these transfer payments affordable, in either economic or moral terms? By continuing and enlarging them, do we subsidise sloth? (3)

When we place our faith in hard work, we're wishing for the creation of character; but we're also hoping, or expecting, that the labour market will allocate *incomes* fairly and rationally. And there's the rub. Character can be created on the job only when we can see that there's a justifiable relation between past effort, learned skills and present reward. When I see that your income is completely out of proportion to your production of real value, of durable goods the rest of us can use and appreciate (and by 'durable' I don't mean just material things), I begin to doubt that character is a consequence of hard work. When I see, for example, that you're making millions by laundering drug-cartel money, or preying on low-income borrowers, or buying votes in Congress – while I'm barely making ends meet from the earnings of my full-time job, I realise that my participation in the labour market is irrational. I know that building my character through work is stupid because crime pays. I might as well become a gangster like you. That's why an economic crisis such as the Great Recession is also a moral problem and an intellectual opportunity. We've placed so many bets on the social, cultural and ethical meaning of work that when the labour market fails, as it so spectacularly has, we're at a loss to explain what happened, or to orient ourselves to a different set of meanings for work and for markets. And by 'we' I mean pretty much all of us, Left to Right, because everybody wants to put Americans back to work, one way or another –

‘full employment’ is the goal of Right-wing politicians no less than Left-wing economists. The differences between them are over means, not ends, and those ends include intangibles such as the acquisition of character. Because work means everything to us inhabitants of modern market societies – regardless of whether it still produces solid character and allocates incomes rationally, and quite apart from the need to make a living. It’s been our way of defying death, by making and repairing the durable things, the significant things we know will last beyond our allotted time on earth because they teach us, as we make or repair them, that the world beyond us – the world before and after us – has its own reality principles. Think about the scope of this idea. Work has been a way of demonstrating differences between males and females, for example by merging the meanings of fatherhood and ‘breadwinner’, and then, more recently, prying them apart. Since the 17th century, masculinity and femininity have been defined – not necessarily achieved – by their places in a moral economy, as working men who got paid wages for their production of value on the job, or as working women who got paid nothing for their maintenance of families. Of course, these definitions are now changing, as the meaning of ‘family’ changes, along with profound and parallel changes in the labour market – the entry of women is just one of those. When work disappears, the genders produced by the labour market are blurred. When socially necessary labour declines, what we once called *women’s work*– education, healthcare, service – becomes our basic industry. The labour of love, caring for one another – socially beneficial labour – becomes not merely

possible but necessary, and not just within families, where affection is routinely available. No, I mean out there, in the wide, wide world. (4)

Though work has often entailed obedience and hierarchy (see above), it's also where many of us, probably most of us, have consistently expressed our deepest human desire, to be free of externally imposed obligation, to be self-sufficient. We have defined ourselves for centuries by what we do, by what we *produce*. But by now we must know that this definition of ourselves entails the principle of productivity – from each according to his abilities, to each according to his creation of real value through work – and commits us to the inane idea that we're worth only as much as the labour market can register, as a price. (5)

Until now, the principle of productivity has functioned as the reality principle that made the American Dream seem plausible. 'Work hard, play by the rules, get ahead', or, 'You get what you pay for, you make your own way, you rightly receive what you've honestly earned' – such exhortations used to make sense of the world. At any rate they didn't sound delusional. By now they do. So the impending end of work raises the most fundamental questions about what it means to be human. To begin with, what purposes could we choose if the job – economic necessity – didn't consume most of our waking hours and creative energies? What evident yet unknown possibilities would then appear? How would human nature itself change as the ancient, aristocratic privilege of leisure becomes the birthright of human beings as such? Psychology insisted that love and work were the essential ingredients of healthy human being. But can we let people get something for nothing and still treat them as our brothers and sisters – as members of a beloved

community? We won't have any answers until we acknowledge that work now means everything to us – and that hereafter it can't. (6)

Adapted from Aeon.

Exercise III.

Find paragraphs, dealing with the following: self-discipline, plausible, ridiculous, gangster, faith, intangible, scope, delusional, hierarchy.

Exercise IV.

Fill in the gaps according to the text.

- 1..... believe in full employment.
- 2.....think that work builds character.
3. These days, everybody from Left to Right addresses this breakdown of the labour market by advocating..... , as if having a job is self-evidently a good thing, no matter how dangerous, demanding or demeaning it is.
4. The official unemployment rate in the United States is already below per cent, which is pretty close to what economists used to call 'full employment', but income inequality hasn't changed a bit.
5. Already a fourth of the adults actually employed in the are paid wages lower than would lift them above the official poverty line – and so a fifth of American children live in poverty.
6. Almost half of employed adults in this country are eligible for.....

7. Those jobs that disappeared in the Great Recession just aren't coming back, regardless of what the unemployment rate tells you – the net gain in jobs since 2000 still stands at – and if they do return from the dead, they'll be zombies, those part-time or minimum-wage jobs where the bosses from week to week: welcome to Wal-Mart, where food stamps are a benefit.

8. The current federal minimum wage is.....

9. Working a -hour week, you would have to make \$10 an hour to reach the official.....

10. The economists who study employment trends tell us that almost half of existing jobs, including those involving 'non-routine cognitive tasks' – you know, like thinking – are by computerisation within 20 years.

Exercise V.

Make up sentences of your own with the following word combinations: full employment, self-discipline, income, at any rate, to pay the bills, to keep somebody away from, plausible, labour market, to play by the rules, unemployment rate.

Exercise VI.

Determine whether the statements are true or false. Correct the false statements

1. Economists don't believe in full employment.
2. Russian people think that work builds character.
3. These days, everybody from Left to Right addresses this breakdown of the labour market by advocating 'full employment', as if

having a job is self-evidently a good thing, no matter how dangerous, demanding or demeaning it is.

4. But ‘full employment’ is the way to restore our faith in hard work, or in playing by the rules, or in whatever else sounds good.

5. The official unemployment rate in the United States is already below 10 per cent, which is pretty close to what economists used to call ‘full employment’, but income inequality hasn’t changed a bit.

6. Already a fourth of the adults actually employed in the UK are paid wages lower than would lift them above the official poverty line – and so a fifth of American children live in poverty.

7. Almost half of unemployed adults in this country are eligible for food stamps.

8. The market in labour has broken down, along with most others.

9. Those jobs that disappeared in the Great Recession just aren’t coming back, regardless of what the unemployment rate tells you – the net gain in jobs since 2001 still stands at zero – and if they do return from the dead, they’ll be zombies, those part-time or minimum-wage jobs where the bosses shuffle your shift from week to week: welcome to Wal-Mart, where food stamps are a benefit.

10. The current federal minimum wage is \$10.50.

Exercise VII .

Match the words to the definitions in the column on the right:

rate	the speed at which something happens or changes, or the amount or number of times it happens or changes
------	---

	in a particular period
income	the unfair situation in society when some people have more opportunities, money, etc. than other people
bill	the number of people who do not have a job that provides money
self-evidently	great trust or confidence in something or someone
plausible	the habit of arriving or happening at the time that has been agreed
ridiculous	money that is earned from doing work or received from investments
faith	a request for payment of money owed, or the piece of paper on which it is written
unemployment	seeming likely to be true, or able to be believed
punctuality	stupid or unreasonable and deserving to be laughed at
inequality	clear or obvious without needing any proof or explanation

Exercise VIII.

Summarize the article “What if jobs are not the solution, but the problem?”

Part 2

Exercise I.

Identify the part of speech the words belong to: punctuality, initiative, honesty, relatively, efficient, responsible, plausible, ridiculous, dealer, banker.

Exercise II.

Form nouns from the following words:

believed (1), appreciate (4), employed (2), measurable (2), durable (4), economic (2), explain (4), imagine (2), organises (3), different (4)

Exercise III.

Find synonyms to the following words. Translate them into Russian: self-discipline, efficient, sure, responsible, plausible, ridiculous, full, self-evidently, dangerous, restore.

Exercise IV.

Find antonyms to the following words. Translate them into Russian: efficient, sure, responsible, plausible, ridiculous, full, dangerous, restore, faith, hard

Exercise V.

Match the words to make word combinations:

social	inequality
part-time	tasks
labour	employment
income	jobs
hard	Street

unemployment	dealer
Wall	market
full	problems
cognitive	rate
drug	work

Exercise VI.

QUIZ (The Art of Computer Animation)

1) The process of building an object on the computer within 3D space is most often called...

- A. Surfacing
- B. Sculpting
- C. Modeling
- D. 3D Drawing

2) Once the character or object is built in the program, what is the process called of adding color, reflection, transparency, translucency and roughness?

- A. Sculpting
- B. Texturing
- C. Air Brushing
- D. Coloring

3) Basic shapes, such as cubes, cylinders and circles that are used to build an object are called...

- A. Parts
- B. Shapes
- C. Primitives
- D. Pieces

4) To create real world reflections in most software packages, the "reflection" is actually made up of three parts. Can you guess which of the following is not part of the reflection channel?

- A. Transparency
- B. Glossiness
- C. Specularity
- D. Reflection

5) Unlike traditional animation, in the world of 3D, the computer interpolates the movement between poses rather than having an artist manually animate each and every frame. What are these key poses called?

- A. Static Poses
- B. Key Positions
- C. Graph Frames
- D. Key Frames

6) Light in the real world continually bounces off of objects to illuminate an area. In the 3D software, this real world light simulation is extremely render intensive on the computer, but produces beautiful results. Can you guess what most software dubs this simulation?

A. Hypervoxels

B. Volumetrics

C. Radiosity

D. Dynamics

7) When building an object in 3D space, it is a wise idea to build it to the scale of its real world counterpart.

A. True

B. False

8) Everything in a 3D scene has to be either manually animated or calculated by the computer, as nothing is preset in the software. What is the calculation called to recreate real world effects such as gravity, wind, liquids and collisions?

A. Dynamics

B. Real world events

C. Simulations

D. Motions

4. How statistics lost their power – and why we should fear what comes next

Part 1

Exercise I.

Say what Russian words help to guess the meaning of the following words: statistics, accurately, private, democracy, theory, arguments, stable, federal project.

Exercise II.

Make sure you know the following words and word combinations.

to put in peril, from one perspective, from the opposite perspective, to impose one's worldview on, crucial role, conspiracy theories, prejudice, to validate, to view something through the lens of, reference point, diffuse, wholehearted, resentment, comprehensible, to encompass, under-employment, reasonable assumption, clumsy, outcry, proposition.

How statistics lost their power – and why we should fear what comes next

The ability of statistics to accurately represent the world is declining. In its wake, a new age of big data controlled by private companies is taking over – and putting democracy in peril.

In theory, statistics should help settle arguments. They ought to provide stable reference points that everyone can agree on. Rather

than diffusing controversy, it seems as if statistics are actually stoking it. A study in the US discovered that 68% of Trump supporters distrusted the economic data published by the federal government. In the UK, a research project by Cambridge University and YouGov looking at conspiracy theories discovered that 55% of the population believes that the government “is hiding the truth about the number of immigrants living here”. Not only are statistics viewed by many as untrustworthy, there appears to be something almost insulting about them. Reducing social and economic issues to averages seems to violate some people’s sense of political decency. The declining authority of statistics – and the experts who analyse them – is at the heart of the crisis that has become known as “post-truth” politics. And in this uncertain new world, attitudes towards quantitative expertise have become increasingly divided. From one perspective, grounding politics in statistics is undemocratic and oblivious to people’s emotional investments in their community and nation. It is just one more way that privileged people in London, Washington DC or Brussels seek to impose their worldview on everybody else. From the opposite perspective, statistics enable journalists, citizens and politicians to discuss society as a whole, not on the basis of sentiment or prejudice, but in ways that can be validated. Is there a way out of this polarisation? Must we simply choose between a politics of facts and one of emotions, or is there another way of looking at this situation? One way is to view statistics through the lens of their history. We need to try and see them for what they are: neither unquestionable truths nor elite conspiracies, but rather as tools designed to simplify the job of government, for better or worse. Viewed

historically, we can see what a crucial role statistics have played in our understanding of nation states and their progress. (1)

As indicators of health, prosperity, equality, opinion and quality of life have come to tell us who we are collectively and whether things are getting better or worse, politicians have leaned heavily on statistics to buttress their authority. Often, they lean too heavily, stretching evidence too far, interpreting data too loosely, to serve their cause. But that is an inevitable hazard of the prevalence of numbers in public life, and need not necessarily trigger the type of wholehearted rejections of expertise that we have witnessed recently. In many ways, the contemporary attack on “experts” is born out of the same resentment as the attack on elected representatives. In talking of society *as a whole*, in seeking to govern the economy *as a whole*, politicians are believed to have “lost touch” with how it feels to be a single citizen *in particular*. Both statisticians and politicians have fallen into the trap of “seeing like a state”, to use a phrase from the anarchist political thinker James C Scott. Speaking scientifically about the nation – for instance in terms of macroeconomics – is an insult to those who would prefer to rely on memory and narrative for their sense of nationhood, and are sick of being told that their “imagined community” does not exist. On the other hand, statistics (together with elected representatives) performed an adequate job of supporting a credible public discourse for decades if not centuries. What changed? The crisis of statistics is not quite as sudden as it might seem. For roughly 450 years, the great achievement of statisticians has been to reduce the complexity of national populations into manageable, comprehensible facts and figures. Yet in recent decades, the world has changed dramatically. Traditional forms of

statistical classification and definition are coming under strain from more fluid identities, attitudes and economic pathways. Efforts to represent demographic, social and economic changes in terms of simple, well-recognised indicators are losing legitimacy. So long as people can be placed into categories, it becomes possible to discern how far a given classification extends across the population. This can involve somewhat reductive choices. To count as unemployed, for example, a person has to report to a survey that they are involuntarily out of work, even if it may be more complicated than that in reality. Many people move in and out of work all the time, for reasons that might have as much to do with health and family needs as labour market conditions. But thanks to this simplification, it becomes possible to identify the rate of unemployment across the population as a whole. Here's a problem, though. What if many of the defining questions of our age are not answerable in terms of the extent of people encompassed, but the *intensity* with which people are affected? Unemployment is one example. The fact that Britain got through the Great Recession of 2008-13 without unemployment rising substantially is generally viewed as a positive achievement. But the focus on "unemployment" masked the rise of *underemployment*, that is, people not getting a sufficient amount of work or being employed at a level below that which they are qualified for. This currently accounts for around 6% of the "employed" labour force. Then there is the rise of the self-employed workforce, where the divide between "employed" and "involuntarily unemployed" makes little sense. So long as politicians continue to deflect criticism by pointing to the unemployment rate, the experiences of those struggling to get enough work or to live on their

wages go unrepresented in public debate. It wouldn't be all that surprising if these same people became suspicious of policy experts and the use of statistics in political debate, given the mismatch between what politicians say about the labour market and the lived reality. Statistical data is only credible if people will accept the limited range of demographic categories that are on offer, which are selected by the expert not the respondent. But where identity becomes a political issue, people demand to define themselves on their own terms, where gender, race or class is concerned. Opinion polling may be suffering for similar reasons. Polls have traditionally captured people's attitudes and preferences, on the reasonable assumption that people will behave accordingly. But in an age of declining political participation, it is not enough simply to know which box someone would prefer to put an "X" in. One also needs to know whether they feel strongly enough about doing so to bother. And when it comes to capturing such fluctuations in emotional intensity, polling is a clumsy tool. (2)

In recent years, a new way of visualising populations has emerged that potentially pushes statistics to the margins, ushering in a different era altogether. Statistics, collected by technical experts, are giving way to data that accumulates by default, as a consequence of sweeping digitisation. Traditionally, statisticians have known which questions they wanted to ask regarding which population, then set out to answer them. By contrast, data is automatically produced whenever we comment on Facebook or search for something on Google. As our cities, cars, homes and household objects become digitally connected, the amount of data we leave in our trail will grow even greater. In this new world, data is captured first and research questions come later. In the

long term, the implications of this will probably be as profound as the invention of statistics was in the late 17th century. The rise of “big data” provides far greater opportunities for quantitative analysis than any amount of polling or statistical modelling. But it is not just the quantity of data that is different. It represents an entirely different type of knowledge. First, there is no fixed scale of analysis (such as the nation) nor any settled categories (such as “unemployed”). These vast new data sets can be mined in search of patterns, trends, correlations and emergent moods. It becomes a way of tracking the identities that people bestow upon themselves rather than imposing classifications upon them. Second, we live in an age in which our feelings, identities and affiliations can be tracked and analysed with unprecedented speed and sensitivity – but there is nothing that anchors this new capacity in the public interest or debate. There are data analysts who work for Google and Facebook, but they are not “experts” of the sort who generate statistics. The anonymity and secrecy of the new analysts potentially makes them far more politically powerful than any social scientist. A company such as Facebook has the capacity to carry quantitative social science on hundreds of millions of people, at very low cost. But it has very little incentive to reveal the results. In 2014, when Facebook researchers published results of a study of “emotional contagion” that they had carried out on their users – in which they altered news feeds to see how it affected the content that users then shared in response – there was an outcry that people were being unwittingly experimented on. So, from Facebook’s point of view, why go to all the hassle of publishing? Why not just do the study and keep quiet? (3)

This ability to develop psychological insights across large

populations is one of the most innovative and controversial features of the new data analysis. Techniques of “sentiment analysis”, which detect the mood of large numbers of people by tracking indicators such as word usage on social media, become incorporated into political campaigns. In this new technical and political climate, it will fall to the new digital elite to identify the facts, projections and truth amid the rushing stream of data. The question to be taken more seriously, now that numbers are being constantly generated behind our backs and beyond our knowledge, is where the crisis of statistics leaves representative democracy. Statistics began life as a tool through which the state could view society, but gradually developed into something that academics, reformers and businesses had a stake in. But for many data analytics firms, secrecy surrounding methods and sources of data is a competitive advantage that they will not give up voluntarily. A post-statistical society is a potentially frightening proposition, not because it would lack any forms of truth or expertise altogether, but because it would drastically privatise them. (4)

Adapted from The Guardian.

Exercise III.

Find paragraphs, dealing with the following: crucial role, conspiracy theories, untrustworthy, “post-truth”, worldview, prejudice, lens , unquestionable, inevitable hazard.

Exercise IV.

Fill in the gaps according to the text.

1. A study in the US discovered that 68% of Trump supporters

- the economic data published by the federal government
2. In the UK, Cambridge University and YouGov looking at discovered that 55% of the population believes that the government “is hiding the truth about the number of immigrants living here”.
 3. As indicators of health, prosperity, equality, opinion and quality of life have come to tell us who we are collectively and whether things are getting better or worse, politicians have leaned heavily on to buttress their authority.
 4. In talking of society as a whole, in seeking to govern the economy as a whole, politicians are believed with how it feels to be a single citizen in particular.
 5. Both statisticians and politicians have fallen into the trap of “.....”, to use a phrase from the anarchist political thinker James C Scott.
 6. For roughly 450 years, the great achievement of statisticians has been of national populations into manageable, comprehensible facts and figures.
 7. The fact thatgot through the Great Recession of 2008-13 without unemployment rising substantially is generally viewed as a positive achievement.
 8. But the focus on “unemployment” masked the rise of....., that is, people not getting a sufficient amount of work or being employed at a level below that which they are qualified for.
 9. This currently..... around 6% of the “employed” labour force.
 10. In the long term, of this will probably be as profound as the invention of statistics was in the late 17th century.

Exercise V.

Make up sentences of your own with the following word combinations:
to put something in peril, from one perspective/ from the opposite
perspective, to impose one's worldview on, crucial role, prejudice, to
validate, to view something through the lens of, unquestionable truths

Exercise VI.

Determine whether the statements are true or false. Correct the false
statements:

1. The ability of statistics to accurately represent the world is declining.
2. A new age of big data controlled by private companies is taking over – and putting democracy in peril
3. In theory, statistics should help settle arguments.
4. A study in the US discovered that 58% of Trump supporters distrusted the economic data published by the federal government.
5. In the UK, a research project by Cambridge University and YouGov looking at conspiracy theories discovered that 50% of the population believes that the government “is hiding the truth about the number of immigrants living here”.
6. Not only are statistics viewed by many as untrustworthy, there appears to be something almost insulting about them.
7. From one perspective, grounding politics in statistics is undemocratic and oblivious to people's emotional investments in their community and nation.
8. It is just one more way that privileged people in London, Washington DC or Brussels seek to impose their worldview on everybody else.
9. From the opposite perspective, statistics enable journalists, citizens and politicians to discuss society as a whole, not on the basis of sentiment or prejudice, but in ways that can be validated.

10. Viewed historically, we can see what a crucial role statistics have played in our understanding of nation states and their progress.

Exercise VII .

Match the words to the definitions in the column on the right:

journalist	to force someone to accept something, especially a belief or way of living
impose	an unfair and unreasonable opinion or feeling, especially when formed without enough thought or knowledge
untrustworthy	a person who has come to a different country in order to live there permanently
violate	a person who writes news stories or articles for a newspaper or magazine or broadcasts them on radio or television
analyse	a general agreement to keep silent about a subject for the purpose of keeping it secret
prejudice	a person who is a member of a particular country and who has rights because of being born there or because of being given rights, or a person who lives in a particular town or city
citizen	to say or do something to someone that is rude or offensive
immigrant	not able to be trusted
insult	to break or act against something, especially a law, agreement, principle, or

	something that should be treated with respect
conspiracy	to study or examine something in detail, in order to discover more about it

Exercise VIII.

Summarize the article “How statistics lost their power – and why we should fear what comes next.”

Part 2

Exercise I.

Identify the part of speech the words belong to: federal, population, immigrant, social, economic, to violate, statistics, to analyse, government,

Exercise II.

Form adverbs from the following words:

private, uncertain, emotional, evidence, inevitable, particular, adequate, recent, different, consequence.

Exercise III.

Find synonyms to the following words. Translate them into Russian: to hide truth, untrustworthy, insult, to violate, to impose, opposite, unquestionable, inevitable, hazard.

Exercise IV.

Find antonyms to the following words. Translate them into Russian:

to hide, truth, untrustworthy, insult, inevitable, roughly, complexity, recent, simple.

Exercise V.

Match the words to make word combinations:

political	hazard
federal	data
inevitable	role
unquestionable	politics
conspiracy	government
research	debate
crucial	truths
economic	perspective
“post-truth”	project
opposite	theories

Exercise VI.

QUIZ (Hyper Text Markup Language, or HTML)

HTML is the code used by programmers to make some of the simplest parts of a webpage, such as bold and italic text, links to other pages or photos

1) When using tags in HTML code, they always appear how?

A. Always singularly

B. In document footers and end notes only

C. Only on the top of a document

D. Inside of angled brackets

2) Many modern websites will automatically fill in basic HTML codes for the user, but back in the days of hand coding how did a user start a new paragraph in HTML?

A. All sites were written in large copy blocks with no paragraph breaks

B. Writing out "NEW PARAGRAPH" inside angle brackets

C. With the letter "P" inside angle brackets

D. By pressing the enter or return key

3) If a programmer types "HR" (inside of angle brackets) into his or her site, what is it that they are adding?

A. A new "house rule" or invisible element

B. A link to an external website

C. A huge rendered photo

D. A horizontal line

4) What is the correct HTML tag syntax for adding a background color to an entire page?

A. bgcolor="yellow"

B. Yellow Background: Tag

C. BACKGROUND=YELLOW

D. b Yellow:010110001 /b

5) What organization sets the standards that are used across the internet?

A. Apple

B. Google

C. The World Wide Web Consortium

D. Microsoft

6) Which keyboard symbol is used to indicate a closing tag?

A. hashtag or number sign

B. angle bracket

C. forward slash

D. asterisk

7) HTML coding is what is used to create games such as "Minecraft" and "Super Mario Brothers".

A. True

B. False

8) Websites, or specifically the code used to make them do not fall under copyright protection anywhere in the world.

A. True

B. False

9) What is the correct HTML formatting for inserting a hyperlink on a website?

A. A HREF="http://www.webaddress.com" (closed with /A)

B. INSERT www.webaddress.com (closed with /I)

C. WEB site name (closed with /WEB)

D. !CLICK HERE!

10) When writing HTML code, you have to adhere to a strict standard of using spaces.

A. True

B. False