

Exercise 1: Choose one of the answers from A, B, C.

1) Research conducted at Oxford University came to the conclusion...

- A) ...that half of the jobs we do today could be done by machines in the future.
- B) ...that a ratio of 2 to 1 people have had their jobs replaced by robots.
- C) ...that one in every two people work with machines in their job.

2) The speaker knows a lot about this area of industry because...

- A) ...he is a computer scientist who designs robots.
- B) ...he owns a company that specialises in machine learning.
- C) ...he has a company that designs and builds industrial machines.

3) Machine learning...

- A) ...was invented in 1990.
- B) ...started to become popular with companies in the 90's.
- C) ...was first used in the late 90's.

4) Which of these is true:

- A) ...In 2012, Kaggle built a machine that could be used in the classroom to replace teachers.
- B) ...In 2012, Kaggle had a competition to see who could develop an algorithm that could mark essays as well as teachers.
- C) ...In 2012, Kaggle commissioned developers to create an algorithm that could grade English essays.

5) The speaker says that...

- A) ... we have no chance of beating machines at doing repetitive tasks.
- B) ... we have no chance of being better than machines when doing complex tasks.
- C) ...we have no chance of ever beating machines at difficult tasks.

- 6) **The speaker points out the difference between humans and machines being that...**
- A) ...we can solve new problems that we have never encountered before, but machines can't.
 - B) ...machines can work out problems quickly whereas we need a lot of research, trial and error.
 - C) ...machines never get tired of doing the same thing over and over again.
- 7) **What was Percy Spencer doing when he invented the microwave over?**
- A) Cooking.
 - B) Eating a chocolate bar.
 - C) Developing radar.
- 8) **What restricts a machine's ability to automate certain tasks?**
- A) Many machines cannot operate when flowers are pollinating.
 - B) It cannot read novels and therefore cannot be creative.
 - C) It does not have the creative ability to recognise new situations.
- 9) **Tick all the jobs that the speaker says a machine can't do:**
- a. Diagnose certain diseases
 - b. Write advertising copy
 - c. Grade essays.
 - d. Complex tax structuring
 - e. Conduct audits
 - f. Litigation
- 10) **The speaker says that in the future...**
- A) machines will be developing business strategy.
 - B) machines will become more creative.
 - C) humans will be developing marketing campaigns.

** These questions are based on typical Cambridge exam questions.*

Anthony Goldbloom - he jobs we'll lose to machines - and the ones we won't

0:11 So this is my niece. Her name is Yahli. She is nine months old. Her mum is a doctor, and her dad is a lawyer. By the time Yahli goes to college, the jobs her parents do are going to look dramatically different.

0:26 In 2013, researchers at Oxford University did a study on the future of work. They concluded that almost one in every two jobs have a high risk of being automated by machines¹. Machine learning is the technology that's responsible for most of this disruption. It's the most powerful branch of artificial intelligence. It allows machines to learn from data and mimic some of the things that humans can do. My company, Kaggle, operates on the cutting edge of machine learning². We bring together hundreds of thousands of experts to solve important problems for industry and academia. This gives us a unique perspective on what machines can do, what they can't do and what jobs they might automate or threaten.

1:08 Machine learning started making its way into industry in the early '90s³. It started with relatively simple tasks. It started with things like assessing credit risk from loan applications, sorting the mail by reading handwritten characters from zip codes. Over the past few years, we have made dramatic breakthroughs. Machine learning is now capable of far, far more complex tasks. In 2012, Kaggle challenged its community to build an algorithm that could grade high-school essays⁴. The winning algorithms were able to match the grades given by human teachers. Last year, we issued an even more difficult challenge. Can you take images of the eye and diagnose an eye disease called diabetic retinopathy? Again, the winning algorithms were able to match the diagnoses given by human ophthalmologists.

1:56 Now, given the right data, machines are going to outperform humans at tasks like this. A teacher might read 10,000 essays over a 40-year career. An ophthalmologist might see 50,000 eyes. A machine can read millions of essays or see millions of eyes within minutes. We have no chance of competing against machines on frequent, high-volume tasks⁵.

2:19 But there are things we can do that machines can't do. Where machines have made very little progress is in tackling novel situations. They can't handle things they haven't seen many times before. The fundamental limitations of machine learning is that it needs to learn from large volumes of past data. Now, humans don't. We have the ability to connect seemingly disparate threads to solve problems we've never seen before⁶.

2:45 Percy Spencer was a physicist working on radar during World War II, when he noticed the magnetron was melting his chocolate bar⁷. He was able to connect his understanding of electromagnetic radiation with his knowledge of cooking in order to invent -- any guesses? -- the microwave oven.

3:02: Now, this is a particularly remarkable example of creativity. But this sort of cross-pollination happens for each of us in small ways thousands of times per day. Machines cannot compete with us when it comes to tackling novel situations,⁸ and this puts a fundamental limit on the human tasks that machines will automate.

3:21: So what does this mean for the future of work? The future state of any single job lies in the answer to a single question: To what extent is that job reducible to frequent, high-volume tasks, and to what extent does it involve tackling novel situations? On frequent, high-volume tasks, machines are getting smarter and smarter. Today they grade essays. They diagnose certain diseases. Over coming years, they're going to conduct our audits, and they're going to read boilerplate from legal contracts. Accountants and lawyers are still needed. They're going to be needed for complex tax structuring,^{9d} for pathbreaking litigation^{9e}. But machines will shrink their ranks and make these jobs harder to come by.

3:59: Now, as mentioned, machines are not making progress on novel situations. The copy behind a marketing campaign needs to grab consumers' attention. It has to stand out from the crowd. Business strategy means finding gaps in the market, things that nobody else is doing. It will be humans that are creating the copy behind our marketing campaigns,^{9b / 10} and it will be humans that are developing our business strategy.

4:20: So Yahli, whatever you decide to do, let every day bring you a new challenge. If it does, then you will stay ahead of the machines. Thank you.