

# Overview of AI

Click on a question number to see how your answers were marked and, where available, full solutions.

Question Number	Score		
Question 1	1	/	1
Question 2	1	/	1
Question 3	1	/	1
Question 4	0	/	0
<b>Total</b>	<b>3</b>	<b>/</b>	<b>3 (100%)</b>

The pass rate for the questions in the tutorial is 50%, if you score less than this you might want to revisit the questions you had difficulty with and read some of the resources pertaining to that topic.

Thank you for using this tool, in order to improve the system please complete the questionnaire linked below:

<https://forms.ncl.ac.uk/view.php?id=6719176> (<https://forms.ncl.ac.uk/view.php?id=6719176>)

## Performance Summary

<b>Exam Name:</b>	Overview of AI
<b>Session ID:</b>	02828091809
<b>Exam Start:</b>	Thu Dec 10 2020 11:42:02
<b>Exam Stop:</b>	Thu Dec 10 2020 11:44:13
<b>Time Spent:</b>	0:02:10

## Question 1

Artificial Intelligence (AI) is a field of computer science which endeavours to comprehend what intelligence is and to create intelligent machines.

### A few formal definitions of AI:

Professor John McCarthy (coined the term AI):

*AI "is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable."*

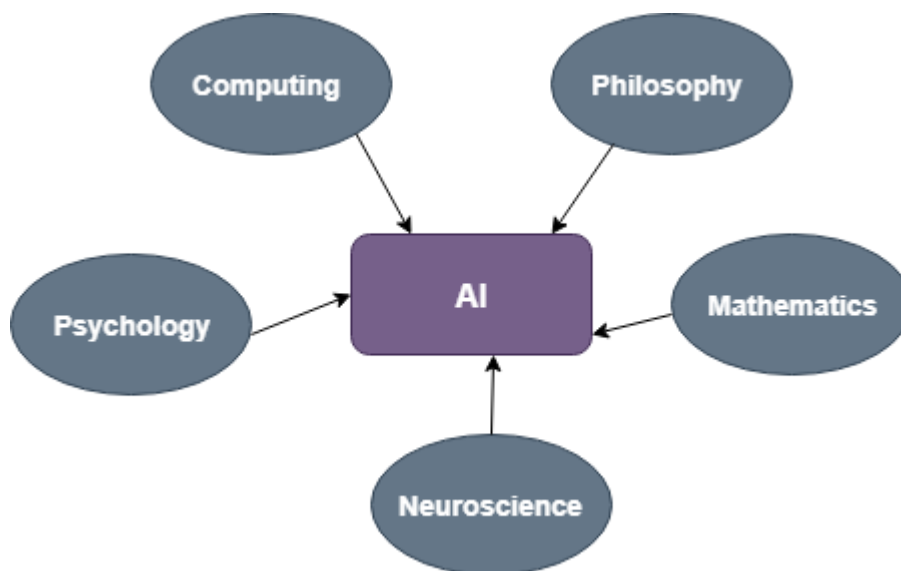
Oxford English Dictionary:

*AI is "the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."*

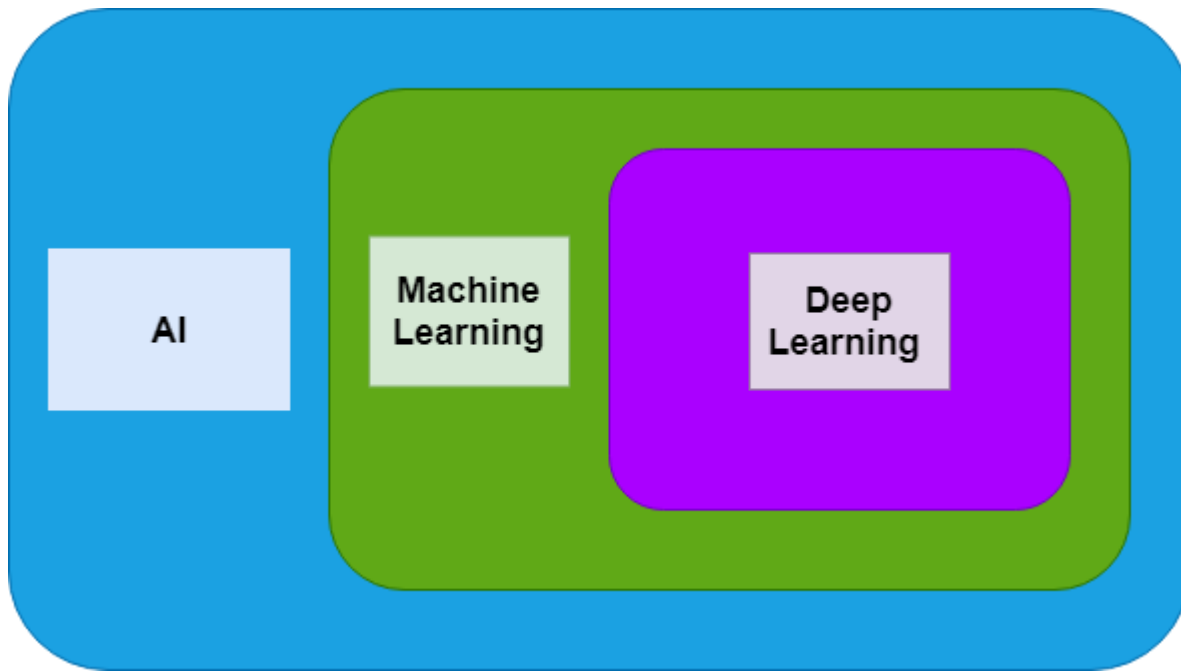
Encyclopedia Britannica:

*"AI, the ability of a digital computer or a computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience."*

There are many disciplines which contribute to AI including:



Within the field of AI there many subdisciplines such as machine learning, deep learning and reinforcement learning which will be covered in later tutorials.



## Real-Life AI Applications

AI technology is applied within many differing domains including:

- Medical diagnosis systems use computer vision techniques to detect anomalies
- Speech recognition, for example Apple's Siri
- Financial services use AI for a number of purposes such as tracking customer spending and making decisions for loan and mortgage approval

### Resources:

S.Russell, P. Norvig (2010) Artificial Intelligence: A Modern Approach (3rd Ed)

<http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html> (<http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html>)

<https://www.britannica.com/technology/artificial-intelligence#ref219078>  
(<https://www.britannica.com/technology/artificial-intelligence#ref219078>)

<https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095426960>  
(<https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095426960>)

[https://www.tutorialspoint.com/artificial\\_intelligence/artificial\\_intelligence\\_overview.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_overview.htm)  
([https://www.tutorialspoint.com/artificial\\_intelligence/artificial\\_intelligence\\_overview.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_overview.htm))

Who created the term 'AI'?

- ☐ Ada Lovelace    ☐ Steve Jobs    ☒ John McCarthy

## Expected answer:

☐ Ada Lovelace    ☐ Steve Jobs    ☒ John McCarthy

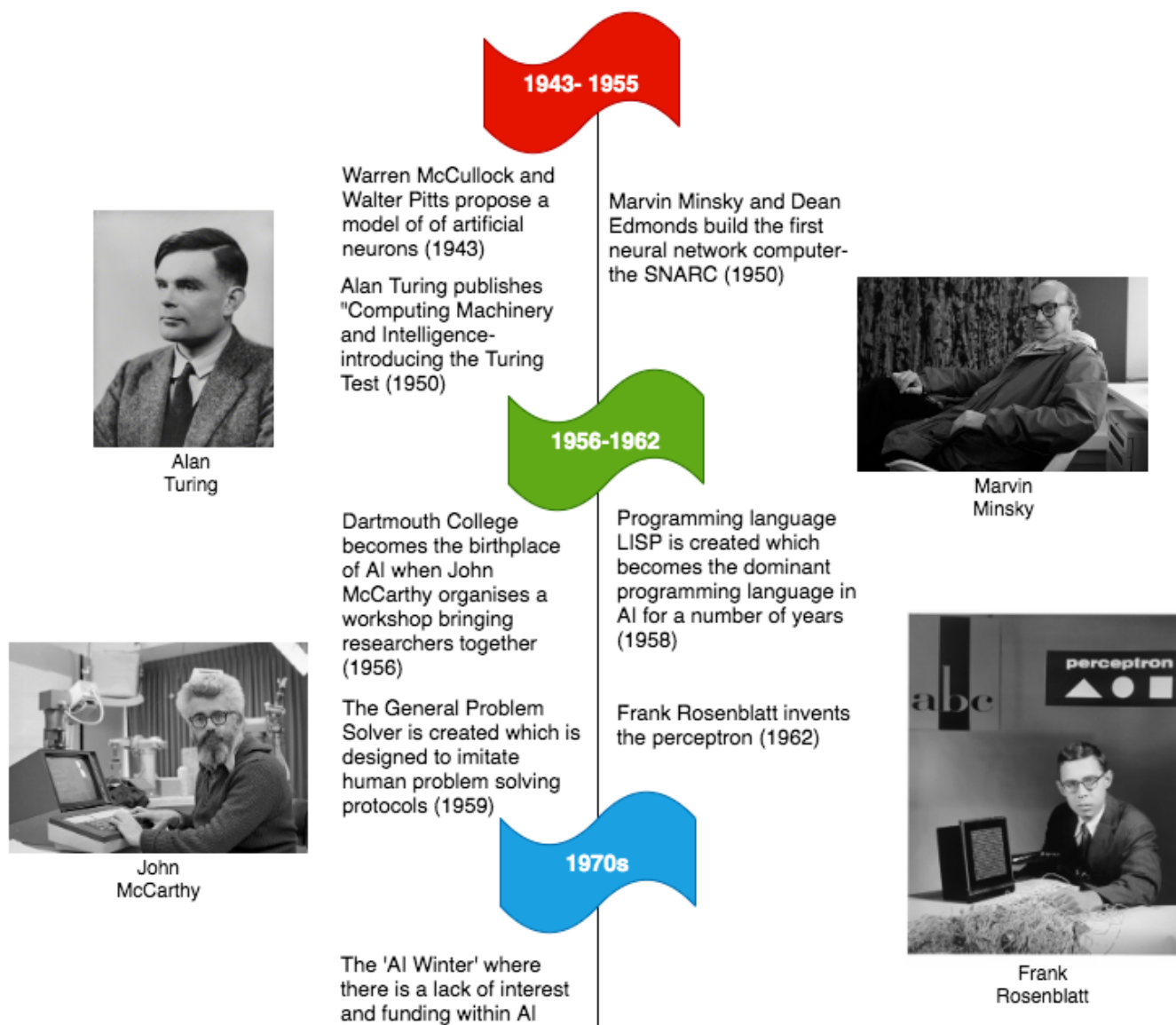


✓ You chose a correct answer. You were awarded **1** mark.  
You scored **1** mark for this part.

Score: 1/1 ✓

## Question 2

Below is a brief timeline of the history of AI:





The timeline above is in no way an exhaustive list of the full history of artificial intelligence but a snapshot of some of the main achievements.

#### Resources:

S.Russell, P. Norvig (2010) Artificial Intelligence: A Modern Approach (3rd Ed)

<https://amturing.acm.org/> (<https://amturing.acm.org/>)

Who invented the perceptron?

- ☐ Marvin Minsky    ☒ Frank Rosenblatt    ☐ Yann Le Cun

Expected answer:

- ☐ Marvin Minsky    ☒ Frank Rosenblatt    ☐ Yann Le Cun



✓ You chose a correct answer. You were awarded **1** mark.  
You scored **1** mark for this part.

Score: 1/1 ✓

## Question 3

The Turing Test was created in 1950 by Alan Turing, he outlined this test in his seminal paper "Computing Machinery and Intelligence."

The main precept of the Turing Test is to determine whether a computer can think and whether this display of "intelligence" is comparable or indistinguishable from human intelligence.

Turing re-defines the question of "Can machines think?" by describing the problem in terms of a game which he named the imitation game.

The imitation game is a game which requires an interrogator, a machine and a human player. The test requires a conversation by the program (by online typed messages) with an interrogator who then has to decide if the conversation is with a program or a person, the program passes the test if it deceives the interrogator 30% of the time.

The Turing test has been highly influential, particularly in the field of the philosophy of artificial intelligence, however it has also been the subject of much criticism. One of the main issues with the Turing test is that it does not test intelligence it only measures whether a computer acts like a human and human behaviour and intelligence are two separate things.

**Resources:**

Link to the paper: <https://academic.oup.com/mind/article/LIX/236/433/986238>  
(<https://academic.oup.com/mind/article/LIX/236/433/986238>)

<https://www.britannica.com/technology/Turing-test> (<https://www.britannica.com/technology/Turing-test>)

S. Russell, P. Norvig (2010) Artificial Intelligence: A Modern Approach (3rd Ed). England: Pearson.

In what year was the Turing test developed?

☐ 1960 ☒ 1950 ☐ 1970

Expected answer:

☐ 1960 ☒ 1950 ☐ 1970



✓ You chose a correct answer. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✓

## Question 4

# AI Ethical Considerations

There are a number of ethical concerns regarding widespread deployment of AI within a range of sectors. It is important to have an understanding of some of the issues you may be unintentionally contributing to and to always keep in mind the effect your program may have on individuals and the wider society.

The UK government have recently set up the Office for Artificial Intelligence and the AI Council which aims to provide expert advice on this field and further the current scope of AI applications within the UK as well as how to responsibly adopt this technology with a positive impact on society (<https://www.gov.uk/government/groups/ai-council> (<https://www.gov.uk/government/groups/ai-council>)).

Below are a list of ethical concerns regarding the widespread dissemination of AI which all developers in this field should be aware of (based upon guidance from the World Economic Forum and Accenture):

- **Bias** - machine learning/AI systems can exacerbate any biases and judgemental opinions of the developer, when creating a program we need to carefully consider whether the system is neutral and fair.
- **Transparency** - when an AI system is deployed which will make a decision or judgement we need to ensure that there is a clear explanation underlying the machines reasoning, this will also ensure accountability if errors occur or something goes wrong.
- **Security** - AI can cause extensive damage if utilised for malicious purposes, therefore procedures and preventative measures must be put in place to avoid hacking.
- **Equality** - widespread adoption of AI technologies may lead to a widening wealth gap within society as many jobs may be lost due to automation and AI driven companies overwhelmingly profiting from this technology.

### Examples of Unethical AI Applications and When AI Technology Has Gone Wrong

In 2015 Amazon realised that the automated system they were using to shortlist candidates resumes was not rating these candidates gender neutrally. The cause of this discrimination was the dataset that the system was trained on, the data fed to the model overwhelmingly contained CVs from men (possibly reflecting the male dominance within the tech industry) and therefore the model taught itself that male applicants were preferable.

In 2018, a pedestrian was killed by an Uber self-driving car on a real-world test run, the car was engaged in autonomous mode however there was a person in the car at the time of the accident. This incident raised a number of ethical questions related to accountability and responsibility when AI systems cause harm.

Although this tutorial has focused on some of the negative aspects of AI, there are also a wide range of benefits of the adoption of this technology within society, however as developers within this field it is important to be aware of some of the implications this technology may have if not utilised or deployed in a responsible manner.

#### Resources and References:

<https://www.gov.uk/government/groups/ai-council> (<https://www.gov.uk/government/groups/ai-council>)

<https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/>  
(<https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/>)

<https://www.accenture.com/gb-en/company-responsible-ai-robotics> (<https://www.accenture.com/gb-en/company-responsible-ai-robotics>)

<https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scrap-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G> (<https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scrap-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G>)

<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>  
(<https://harvardmagazine.com/2019/01/artificial-intelligence-limitations>)



---

Created using Numbas (<https://www.numbas.org.uk>), developed by Newcastle University (<http://www.newcastle.ac.uk>).