3.

Machine learning is a subset of artificial intelligence that enables systems to learn patterns from data and make predictions or decisions without being explicitly programmed.

a)
Describe how supervised learning works in a machine learning system.

In your answer, refer to key components such as *training data*, *labels*, and *model*.

Answer:

When an Ai is trained on how to do something and it is given a dataset for training, then it will follow exactly what the data says. However, if you incorperate controlled machine learning, then the ai can pick up ways to do that thing that are better and more efficient than the original way it was taught.

58 words

Correct answer.   -/1p

b)
Explain one real-world example where machine learning is used.

Describe how the system learns and what kind of data it uses and its impact on people.

Answer:

ChatGPT. Chat (for short) uses machine learning to gather information off of websites to further grow its knowledge, weather that is how to bake a cake or to build a house. People use Chat to figure out questions or how to do something in the real world, which can be helpful for learning because it can act like a teacher if you were never taught those things.

67 words

Correct answer.   -/1p

c)

Machine learning models can sometimes produce biased or inaccurate results.
Discuss one potential cause of this and explain how it could be addressed.

In your answer, refer to a relevant computer science concept such as *training data quality*, *overfitting*, or *algorithm design*.

Answer:

When Ai collects data from training sets or sources online, sometimes data can be inaccurate because of someone's opinion. Ai just takes in all the data and believes it. for example in courts and judicial systems, Ai can take information and see that a higher percentile of inmates or convicted criminals could be a part of the African-American race, and think hmm this person is African-American so he is guilty because so many other people are guilty and criminals. which is just wrong and racist. Ai needs to learn to not stereotype people because of race gender or qualities. Ai should use more accurate ways of determining that someone is innocent or guilty such as checking if facts line up, if someone appears to be stressing or calm, or if that person has been convicted previously. Using information from the web can be helpful to an extent, but in this situation, it is used in a bad way, and it needs to be supervised.

164 words

Correct answer.   -/1p

4.

Natural Language Processing (NLP) allows computers to understand, interpret, and generate human language. NLP is used in applications such as virtual assistants, chatbots, translation services, and spam filters.

a)

Describe what Natural Language Processing (NLP) is and explain how it enables computers to understand human language.

In your answer, refer to one technique used in NLP (e.g. tokenisation, part-of-speech tagging, or sentiment analysis).

Answer:

NLP is used to communicate with humans as an ai. Ai can use datasets to figure out how humants normally talk, and

22 words

b)

Choose one application of NLP (e.g. a digital assistant like Siri or Google Assistant, or a translation tool).

Explain how NLP is used in this context, and what kinds of data and algorithms are involved.

Answer:

> No student answer.

c)

NLP systems can sometimes misinterpret meaning or context.

Discuss ONE challenge and ONE impact of using NLP in real-world systems and explain how developers try to reduce this issue.

In your answer, refer to a concept such as *ambiguity*, *training data*, *bias*, or *language models*.

Answer:

> No student answer.

5.

Neural networks are a key technology behind many modern AI systems. They are designed to mimic the structure and function of the human brain in order to recognise patterns and make decisions.

a)

Describe how a basic neural network works.

In your answer, refer to terms such as *input layer*, *hidden layers*, *output layer*, and *weights*.

Answer:

> No student answer.

Correct answer.   -/1p

b)

Neural networks are often used in image recognition systems (e.g. identifying animals in photos or detecting objects in traffic footage).

Explain how a neural network learns to classify images correctly. Include in your answer a reference to *training data* and *backpropagation*.

Answer:

> Neural networks are used to recognise images and things that look similar or the same to a picture in their database, or neural network. The ai for example will get a picture of a cat and realise "hmm that looks like this image, its a cat!" because that's what the image it was similar to told the ai. it can then also store and keep that image to learn what else looks like both of those images.

77 words

Correct answer.   -/1p

c)

Neural networks can require large amounts of data and computing power. Discuss one advantage and one limitation of using neural networks for real-world decision making and how it impacts people.

In your answer, refer to a relevant concept such as *model complexity*, *overfitting*, or *interpretability*.

Answer:

when the models get to the point of so much complexity they cannot gain more information because they already have so much. There will always be limitations on how much data can be stored as we do not have petabytes upon petabytes of storage just lying around. One advantage of this is that the models can be split off Seperatley as two different ai models to be used as one for example being car knowledge, and the other being academic knowledge. this can help give more focussed help and knowledge along with taking up less space in storages and also less computing power.

103 words

Correct answer.   -/1p

6.

Artificial Intelligence in Healthcare Systems

Artificial Intelligence (AI) technologies—including machine learning, neural networks, natural language processing, and AI-generated content—are increasingly being used in healthcare.

However, these technologies can have both predicted and unpredicted issues.

Select ONE AI technology from a real-world domain from the list below:

- **AI generated content in social media**

- **Car safety systems**

- **Machine learning**

- **Natural language processing**

- **Neural networks**

a)

Selected AI Technology:

Answer:

Machine learning

Machine learning can be used to help with diagnosis or learning how to do surgery in a more accurate, or smarter way. it can also give vital information on patients conditions or what would happen if you do something. all along the way, the ai can be used to learn what to do and what not to do in surgeries or hospitals and health care in general.

69 words

Correct answer.   -/1p

b)

Describe how your selected domain is used in healthcare and explain how it impacts people or systems.

Answer:

Machine learning can help to keep people safe as it can learn how to diagnose people with conditions that doctors can just think about on the spot. It can gain knowledge on what causes different things when something happens to you or when doctors are unsure of what symptoms are for. unlike humans. Ai can use all of its knowledge at once and come up with solutions extremely fast. This can help emergency diagnoses and keeping people healthy and alive, while also keeping hospitals less busy for doctors that have important patients that they need to attend.

97 words

Correct answer.   -/1p

c)

Identify and explain one key problem or issue associated with the use of this AI technology in healthcare.

Answer:

Sometimes the ai could misdiagnose from thinking too hard and coming up with too complex of a situation. which can also happen with doctors, but less often. This could cause doctors to waste their time on someone who has a cold or something simple like that.

46 words

Correct answer.   -/1p

d)

Discuss how the responsible use or impact of AI in healthcare could improve outcomes for society.

In your answer, refer to both the advantages and the disadvantages that must be addressed.

Answer:

it can help lower waiting times in hospitals or healthcare. Even have diagnoses from home online. but then also, some people dont trust ai so then they wont want to use it which is also a disadvantage, because ai is still in its early stages so it is still untrusted by a lot of people.

55 words

Correct answer.   -/1p