

Final Assessment



SHOW WHAT YOU KNOW!

Let's check what we've learned. You can discuss as a group or answer in your student guide. Check your answers below.

1. A self-driving car uses AI to navigate roads, avoid obstacles, and obey traffic laws. This is a complex task, but it's the only task the AI is designed to do. This is a powerful example of:

- ☐ a) Artificial General Intelligence (AGI), as it performs a complex human task.
- ☐ b) Artificial Superintelligence (ASI), as its driving skills can surpass a human's.
- ☐ c) A non-AI system, as it is just following a very detailed set of programmed rules.
- ☐ d) Artificial Narrow Intelligence (ANI), as it is highly specialized for a single purpose.

2. A streaming service wants to analyze its massive library of movies and automatically group them into new, interesting categories (like "Suspenseful Sci-Fi from the 90s" or "Critically-Acclaimed Comedies"). The movies are not already organized this way. Which type of machine learning would be best for discovering these kinds of hidden patterns?

- ☐ a) Supervised Learning, to classify movies based on their existing genre labels.
- ☐ b) Unsupervised Learning, to identify new patterns in the unlabeled movie data.
- ☐ c) Reinforcement Learning, to reward the AI for creating popular new categories.
- ☐ d) None of the above.

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3. Which of the following tasks are good examples of Supervised Learning in action? (Select all that apply)

- ☐ a) A bank's AI system deciding if a credit card transaction is fraudulent based on thousands of past examples of both real and fraudulent transactions.
- ☐ b) An AI exploring a video game world for the first time to figure out how to win.
- ☐ c) An email service identifying if an incoming email is spam based on a huge dataset of emails already marked as "spam" or "not spam."
- ☐ d) A marketing company's AI analyzing customer data to discover new, previously unknown customer groups.

4. An AI is being trained to play chess. After each move, it is told whether that move increased or decreased its chances of winning. The AI uses this feedback to improve its strategy over thousands of games. This "trial and error" approach is a classic example of:

- ☐ a) Supervised Learning, as the AI is supervised by the rules of the game.
- ☐ b) Reinforcement Learning, as the AI learns from feedback (rewards/penalties).
- ☐ c) Unsupervised Learning, as the AI must discover winning strategies on its own.
- ☐ d) Deep Learning, as chess is a very complex game.

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5. A hospital is using an AI to diagnose diseases from medical scans. The AI was trained on a dataset that mostly included scans from one demographic group. When used on the general population, the AI is found to be less accurate for other demographic groups. This is an example of:

- ☐ a) An ethical challenge related to bias in the data and fairness in the AI's outcomes.
- ☐ b) A technical limitation related to the AI's need for more computational power.
- ☐ c) A problem with the AI's user interface design making it hard for doctors to use.
- ☐ d) A success in machine learning generalization, as it works well for one group.

6. A developer is creating an AI that can write poetry. She first trains a model on thousands of poems labeled by genre (sonnet, haiku, etc.). Then, she uses a second model that generates new poems and gets feedback from a human reviewer, who rates each poem on a scale of 1-10 for creativity. The AI uses these ratings to get better at writing poems. Which two types of machine learning is she using?

- ☐ a) Supervised Learning for the genre classification and Unsupervised Learning for the creative generation.
- ☐ b) Unsupervised Learning for finding poetic styles and Reinforcement Learning for improving with ratings.
- ☐ c) Supervised Learning for the genre classification and Reinforcement Learning for improving with ratings.
- ☐ d) Only Supervised Learning, as both processes involve learning from human-provided information.

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7. A city's traffic management system uses AI to control traffic lights. The AI's goal is to minimize overall traffic congestion. It learns by making small changes to the light timings and observing the effect on traffic flow, getting a "reward" for changes that reduce wait times. This is an example of:

- ☐ a) Reinforcement Learning, because it learns by taking actions and getting feedback.
- ☐ b) Supervised Learning, because it learns from past traffic data that is labeled.
- ☐ c) Unsupervised Learning, because it must find hidden patterns in traffic flow.
- ☐ d) None of the above.

8. You upload a photo of your friends to a social media site. The site's AI automatically draws a box around each person's face and asks, "Who is this?". The act of finding and drawing a box around each face is an example of:

- ☐ a) Object Classification, because it is preparing to classify who is in the photo.
- ☐ b) Image Segmentation, because it is separating the faces from the background.
- ☐ c) Facial Recognition, because it is identifying the individuals.
- ☐ d) Object Detection, because it is identifying the location of objects (faces).

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9. A translation app is trying to translate the English sentence "The pitcher threw the ball" into French. The AI needs to determine if "pitcher" refers to a person who throws a baseball or a container for holding water. This is a classic example of which NLP challenge?

- ☐ a) Semantic Ambiguity, because the word has multiple possible meanings in context.
- ☐ b) Colloquialisms and Slang, because the word "pitcher" is used informally.
- ☐ c) Anaphoric Ambiguity, because a pronoun in the sentence is unclear.
- ☐ d) Syntactic Ambiguity, because the sentence structure is confusing.

10. Draw lines to connect the roles to the correct category.

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|--------------------------------------|--|
| 1. Data Engineer ____ | A. Analyzes complex data to find insights and builds predictive models. |
| 2. Machine Learning ____
Engineer | B. Builds and maintains the systems that collect, manage, and prepare data for use. |
| 3. Data Scientist ____ | C. Takes a finished model and deploys it into a real-world application, ensuring it runs efficiently. |

11. A Canadian agricultural company is using AI-powered drones to monitor crop health. The drones fly over fields, using Computer Vision to identify areas affected by pests or drought. This allows farmers to apply water or pesticides only where needed. This is an example of AI being used in:

- ☐ a) Entrepreneurship, because it involves creating a new drone-selling business.
- ☐ b) STEM, because it applies technology to solve a scientific problem in agriculture.
- ☐ c) Robotics, because the drones are physical machines that perform tasks.
- ☐ d) All of the above, as it combines business, science, and physical automation.

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FINAL REVIEW ANSWER KEY

1. d
2. b
3. b, d
4. b
5. a
6. c
7. a
8. d
9. a
10. 1-b, 2-c, 3-a
11. d

