



INDIAN SCHOOL AL WADI AL KABIR

Class: X	Department: Computer Science
WORKSHEET	ARTIFICIAL INTELLIGENCE (417) Part B UNIT 1: Revisiting AI Project Cycle & Ethical Frameworks for AI

1 mark Questions

- Which stage of the AI Project Cycle involves setting a goal for the project by stating the problem and looking at parameters that affect it?
A) Data Exploration B) **Problem Scoping** C) Modeling D) Evaluation
- The domain of AI that enables a machine to analyze visual information and predict decisions based on pixels is known as:
A) Natural Language Processing B) Statistical Data C) **Computer Vision** D) Data Acquisition
- Price comparison websites like PriceGrabber and Shopzilla are primary examples of which AI domain?
A) Computer Vision B) Natural Language Processing C) **Statistical Data** D) Bioethics
- Fill in the Blank:** _____ are step-by-step guides that ensure the choices we make while developing AI do not cause unintended harm. (Answer: **Ethical Frameworks**)
- Which ethical framework focuses on maximizing the overall good and minimizing harm for the greatest number of people?
A) Rights-based B) **Utility-based** C) Virtue-based D) Sector-based
- Unscramble the letters to find a factor that influences decision-making: **I N T I T U I O N**
(Answer: **Intuition**)
- Pick the odd one out and justify:
 - A) Crop monitoring
 - B) Pest detection
 - C) **Email filters**
 - D) Yield estimation**Justification:** Email filters belong to the **Natural Language Processing (NLP)** domain, while the others are applications of **Computer Vision** in agriculture.
- The principle of "Non-maleficence" in Bioethics refers to:
A) Promoting well-being B) **Avoiding causing harm or negative consequences** C) Ensuring justice for all D) Allowing user autonomy
- True or False:** The "Modeling" stage of the AI Project Cycle occurs before "Data Acquisition."
(Answer: **False**; Data Acquisition provides the base for Modeling).
- Assertion:** Bioethics is a sector-based ethical framework.
Reasoning: It focuses specifically on ethical considerations in healthcare and life sciences.
A) **Both Assertion and Reasoning are true, and Reasoning is the correct explanation.**
B) Assertion is true, but Reasoning is false.
C) Both are true, but Reasoning is not the correct explanation.
D) Assertion is false, but Reasoning is true.

11. _____ is a domain of AI that depicts the capability of a machine to get and analyze visual information and afterwards predict some decisions about it.
a) NLP b) Data Sciences c) Augmented Reality d) **Computer Vision**
12. Which of the following is not an example of Computer Vision?
a) seeing an image to identify the object in it.
b) identifying humans or animals in an image.
c) understanding the emotion of a human in the image
d) **adding colour effect to an image.**
13. Which test was designed to know if a machine is intelligent or not?
a) Watson Test b) Deep Blue Test c) **Turing Test** d) Andrew Test
14. Which of these is an example of AI in e-commerce applications?
a) Login b) checkout c) **Recommendations** d) Logout
15. Pick the odd one out and justify your answer:
a) Snap Chat Filter b) Face Lock in Phone c) **Chatbot** d) Image search Option
16. Mr. X has high interpersonal intelligence. He _____.
a) can read books very fast. b) **makes friends quickly.** c) can interact with animals. d) is a good cook.
17. Unscramble the letters and find which is not a virtual assistant.
a) **LZEIA** b) IIRS c) LAEAX d) AACTRON
18. Which of these domains and technologies play an important role in agriculture for analyzing the best crop type and potential issues?
a) Computer Vision b) **Statistical data** c) NLP d) All of these
19. The first humanoid to be given Saudi Arabian Citizenship is _____.
a) Alexa b) **Sophia** c) Gary d) Siri
20. Bias in an AI system may come through _____.
a) data b) developers c) **Both the data and developers** d) None of these
21. Which government organization in India is driving National AI strategy?
a) HRD b) **NITI Aayog** c) IT d) Law
22. Fill in the Blanks:
 1. The basis of decision making depends upon the availability of _____ and how we experience and understand it. (information/data/conditions/ past experience/ knowledge/awareness.)
 2. A machine can also become intelligent if it is trained with _____ which helps them achieve their tasks (data)
23. What is the purpose of defining the problem statement during the Problem Scoping stage in an AI project cycle?
a) To collect data b) **To understand the aim and objective of the project**
c) To train the model d) To process data

24. In what ways can AI models be categorized based on the type of data fed into them?
a) Two domains b) Four domains c) **Three domains** d) Five domains
25. In Statistical Data, what is the primary function of the system in relation to data?
a) Generating large datasets b) **Analyzing data to extract insights**
c) Converting data into images d) Distributing data across networks
26. What is the main goal of Computer Vision projects?
a) Translating audio data into visual descriptions
b) Converting digital data into analogue signals
c) Teaching machines to understand textual information
d) **Converting digital visual data into computer-readable language**
27. What is the primary focus of NLP?
a) Analyzing computer languages
b) Interacting between computers and humans using artificial language
c) **Dealing with the interaction between computers and humans using natural language**
d) Enhancing human-to-human communication
28. What do frameworks provide in the context of problem-solving?
a) Random solutions
b) **Step-by-step guidance**
c) Legal advice
d) Ethical justifications
29. How are Ethical Frameworks for AI categorized?
a) Into legal and illegal frameworks
b) **Into sector-based and value-based frameworks**
c) Into historical and contemporary frameworks
d) Into theoretical and practical frameworks
30. What is the central focus of virtue-based value-based frameworks?
a) Maximizing utility
b) Protecting human rights
c) **Aligning actions with ethical principles and beliefs**
d) Ensuring compliance with legal regulations
31. Which of the following best describes rights-based value-based frameworks?
a) **Prioritizing human rights and dignity, valuing human life over other considerations**
b) Evaluating actions based on maximizing overall good and minimizing harm
c) Centering on the character of the decision-maker and the alignment of actions with personal or societal virtues
d) Focusing on achieving outcomes that offer the greatest benefit
32. What is the primary domain of application for Bioethics?
a) Agriculture
b) **Healthcare and life sciences**
c) Information technology
d) Environmental conservation
33. Assertion: Ethics provide guidance in distinguishing right from wrong.
Reasoning: Ethics consist of a set of values and morals that aid individuals in making moral judgments and decisions.

- a) **Both Assertion and Reasoning are true, and Reasoning is the correct explanation of the Assertion.**
- b) Assertion is true, but Reasoning is false.
- c) Both Assertion and Reasoning are true, but Reasoning is not the correct explanation of the Assertion.
- d) Assertion is false, but Reasoning is true.

34. Assertion: Value-based frameworks in ethics provide guidance by focusing on fundamental ethical principles and values.

Reasoning: These frameworks reflect different moral philosophies guiding ethical reasoning and are concerned with assessing the moral worth of actions.

- a) **Both Assertion and Reasoning are true, and Reasoning is the correct explanation of the Assertion.**
- b) Assertion is true, but Reasoning is false.
- c) Both Assertion and Reasoning are true, but Reasoning is not the correct explanation of the Assertion.
- d) Assertion is false, but Reasoning is true.

2 Mark Questions

35. Define Artificial Intelligence.

A machine is artificially intelligent when it can accomplish tasks by itself - collect data, understand it, analyze it, learn from it, and improve it.

36. How does a machine become Artificially Intelligent?

A machine becomes intelligent by training with data and algorithm. AI machines keep updating their knowledge to optimize their output.

OR

Machines also become intelligent once they are trained with some information which helps them achieve their tasks. AI machines also keep updating their knowledge to optimize their output.

37. What roles does computer vision play in agricultural monitoring systems?

Computer vision is employed in agriculture for crop monitoring, pest detection, and yield estimation. Drones with cameras capture aerial images of farmland, which are then analysed to assess crop health and optimize farming practices.

38. Mention the factors which knowingly or unknowingly influence our decision-making

- Values of Humans and values of non-humans
- Religion
- Intuition & values

39. What is the necessity for Ethical Frameworks in AI development?

- As we have seen how bias could result in unwanted outcomes in AI solutions. Think of the hiring algorithm which was biased against women applicants!
- AI is essentially being used as a decision-making/ influencing tool. As such we need to ensure that AI makes morally acceptable recommendations
- Ethical frameworks ensure that AI makes morally acceptable choices. If we use ethical frameworks while building our AI solutions, we can avoid unintended outcomes, even before they take place!

40. Mention the key characteristics of sector-based frameworks.

These are frameworks tailored to specific sectors or industries. In the context of AI, one common sector-based framework is Bioethics, which focuses on ethical considerations in

healthcare. It addresses issues such as patient privacy, data security, and the ethical use of AI in medical decision-making. Sector-based ethical frameworks may also apply to domains such as finance, education, transportation, agriculture, governance, and law enforcement.

41. What do you mean by Bioethics?

Bioethics is an ethical framework used in healthcare and life sciences. It deals with ethical issues related to health, medicine, and biological sciences, ensuring that AI applications in healthcare adhere to ethical standards and considerations.

Principles of bioethics:

- a) Respect for Autonomy. Enabling users to be fully aware of decision-making. E.g., users of an AI algorithm should know how it functions
- b) Do not harm: Harm to anyone (be it human or non-human) must be avoided at all costs. If no choice is available path of least harm must be always chosen.
- c) Ensure maximum benefit for all: Not only should we avoid harm our actions must focus on providing the maximum benefit possible. The solution should be held to clinical practice standards, not merely technological ethics standards.
- d) Give justice: All benefits and burdens of a particular choice must be distributed in a justified manner across people irrespective of their background.

42. What is Natural Language Processing? Explain any two real-life applications of NLP.

Email filters: Email filters are one of the most basic and initial applications of NLP online. It started with spam filters, uncovering certain words or phrases that signal a spam message.

Machine Translation: NLP is used in machine translation systems like Google Translate and Microsoft Translator to automatically translate text from one language to another. These systems analyze the structure and semantics of sentences in the source language and generate equivalent translations in the target language.

43. Define the domain of Natural Language Processing (NLP).

NLP is a branch of AI that deals with the **interaction between computers and humans using natural language**. Its objective is to enable machines to read, decipher, and make sense of human written or spoken words in a valuable way.

44. Briefly explain the "Respect for Autonomy" principle in Bioethics.

This principle involves **enabling users to be fully aware of how decisions are made**. For example, users of an AI algorithm should understand how it functions and have access to the data used to make decisions.

45. What happens during the "Data Exploration" stage of the AI Project Cycle?

In this stage, large quantities of collected data are given **visual representations** like graphs, flow charts, or maps. This makes it easier to interpret and understand the **patterns** the acquired data follows.

46. What is a "Rights-based" value-based framework?

A rights-based framework **prioritizes the protection of human rights and dignity**, valuing human life above other considerations. It emphasizes individual autonomy and ensures AI systems do not discriminate or violate freedoms

4 Marks Questions

47. Outline the main steps in the AI Project Cycle briefly.

The steps involved in AI project cycle are as given:

The first step is Scope the Problem by which, you set the goal for your AI project by stating the problem which you wish to solve with it. Under problem scoping, we look at various parameters which affect the problem we wish to solve so that the picture becomes clearer

- Next step is to acquire data which will become the base of your project as it will help you in understanding what the parameters that are related to problem scoping.
- Next, you go for data acquisition by collecting data from various reliable and authentic sources. Since the data you collect would be in large quantities, you can try to give it a visual image of different types of representations like graphs, databases, flow charts, maps, etc. This makes it easier for you to interpret the patterns in which your acquired data follows.
- After exploring the patterns, you can decide upon the type of model you would build to achieve the goal. For this, you can research online and select various models which give a suitable output.
- You can test the selected models and figure out which is the most efficient one.
- The most efficient model is now the base of your AI project and you can develop your algorithm around it.
- Once the modelling is complete, you now need to test your model on some newly fetched data. The results will help you in evaluating your model and hence improving it.
- Finally, after evaluation, the deployment stage is crucial for ensuring the successful integration and operation of AI solutions in real-world environments, enabling them to deliver value and impact to users and stakeholders.

48. List the three domains of AI and the data that is used in these domains and Explain in detail.

In AI human-machine interactions done through the following domains:

1. Statistical Data: Statistical Data is a domain of AI related to data systems and processes, in which the system collects numerous data, maintains data sets and derives meaning/sense out of them. The information extracted through statistical data can be used to make a decision about it.

Example of Statistical Data -Price Comparison Websites These websites are being driven by lots and lots of data. PriceGrabber, Price Runner, Junglee, Shopzilla, DealTime are some examples of price comparison websites.

2.Computer Vision (CV): Computer Vision, abbreviated as CV, is a domain of AI that depicts the capability of a machine to get and analyse visual information and afterwards predict some decisions about it. The entire process involves image acquiring, screening, analysing, identifying and extracting information. This extensive processing helps computers to understand any visual content and act on it accordingly.

In computer vision, Input to machines can be photographs, videos and pictures from thermal or infrared sensors, indicators and different sources.

Examples of Computer Vision: Agrocultural monitoring, Surveillance systems

3.Natural Language Processing (NLP): Natural Language Processing, abbreviated as NLP, is a branch of artificial intelligence that deals with the interaction between computers and humans using the natural language. Natural language refers to language that is spoken and written by people, and natural language processing (NLP) attempts to extract information from the spoken and written word using algorithms.

Examples of NLP: Email filters, machine translation

49. **Explain what is Value-based Frameworks and different types of Value-based Frameworks.**

Value-based frameworks focus on fundamental ethical principles and values guiding decision- making. It reflects the different moral philosophies that inform ethical reasoning. Value-

based frameworks are concerned with assessing the moral worth of actions and guiding ethical behaviour. They can be further classified into three categories:

i. Rights-based: Prioritizes the protection of human rights and dignity, valuing human life over other considerations. It emphasizes the importance of respecting individual autonomy, dignity, and freedoms. In the context of AI, this could involve ensuring that AI systems do not violate human rights or discriminate against certain groups.

ii. Utility-based: Evaluates actions based on the principle of maximizing utility or overall good, aiming to achieve outcomes that offer the greatest benefit and minimize harm. It seeks to maximize overall utility or benefit for the greatest number of people. In AI, this might involve weighing the potential benefits of AI applications against the risks they pose to society, such as job displacement or privacy concerns.

iii. Virtue-based: This framework focuses on the character and intentions of the individuals involved in decision-making. It asks whether the actions of individuals or organizations align with virtuous principles such as honesty, compassion, and integrity. In the context of AI, virtue ethics could involve considering whether developers, users, and regulators uphold ethical values throughout the AI lifecycle.
