INDIAN SCHOOL AL WADI AL KABIR

Class: IX	Department: Computer Science	Date:25-08-2024
Worksheet No: 1	ARTIFICIAL INTELLIGENCE	

CHAPTER 2: AI PROJECT CYCLE

OBJECTIVE QUESTIONS

1. The AI Project Cycle mainly has _____.
a. 2 Stages
b. 3 Stages
c. 4 Stages
d. 5 Stages
Ans: d. 5 Stages

2. What are the various parameters which affect the problem _____.
a. You need to acquire data which will become the base of your project
b. You go for data acquisition by collecting data from various reliable and authentic sources.
c. After exploring the patterns, you can decide upon the type of model you would build to achieve the goal.
d. All of the above
Ans: d. All of the above

3. You need to _____ which will become the base of your project as it will help you in understanding what the parameters that are related to problem scoping are.
a. Acquire Data
b. Database
c. Data Mining
d. None of the above
Ans: a. Acquire Data

4. _____by collecting data from various reliable and authentic sources.
a. Data Acquisition
b. Database
c. Data Mining
d. None of the above
Ans: a. Data Acquisition

5. Once the _____is complete, you now need to test your model on some newly fetched data.
a. Data Acquisition
b. Modelling
c. Data Mining
d. None of the above
Ans: b. Modelling

6. _____are the people who face this problem and would be benefited with the solution.
a. Key Persons
b. Stakeholders
c. End user
d. None of the above
Ans: b. Stakeholders

7. _____helps in analyzing the people getting affected directly or indirectly due to it.
a. Who
b. What
c. Where
d. Why
Ans: a. Who

8. _____helps to determine the nature of the problem.
a. Who
b. What
c. Where
d. Why
Ans: b. What

9. "What" block helps to gather evidence from _____ to prove that the problem you have selected actually exists.
a. Media
b. Announcements
c. Newspaper & Articles
d. All of the above
Ans: d. All of the above

10. "Where" block will help you look into the situation in which the _____where it is prominent.
a. Problem arises
b. The context of it
c. The locations
d. All of the above
Ans: d. All of the above

11. In "Why" block canvas, Which of the following canvases is the base of problem solving.
a. Who the people that would be benefitted by the solution
b. What is to be solved
c. Where will the solution be deployed
d. All of the above
Ans: d. All of the above

12. After filling the 4Ws Problem canvas, you now need to summarize all the cards into one _____.
a. Template
b. Situation
c. Both a) and b)
d. None of the above
Ans: a. Template

13. Templates help us to summarize all the key points into one single Template so that in future, whenever there is a need to look back at the basis of the problem, we can take a look at the _____and understand the key elements of it.
a. Problem Solving Template
b. Problem Statement Template
c. Problem Arising Template
d. None of the above
Ans: b. Problem Statement Template

14. _____can be a piece of information or facts and statistics collected together for reference or analysis.
a. Database
b. Data
c. Data Type
d. None of the above
Ans: b. Data

15. Whenever we want an AI project to be able to predict an output, we need to _____it first using data.
a. Analyze
b. Train
c. Explore
d. All of the above
Ans: b. Train

16. You would feed the data into the machine. This is the data with which the machine can be trained. Now, once it is ready, it will predict his next data efficiently. This previous data is known as _____.
a. Testing Data
b. Training Data
c. Exploring Data
d. All of the above
Ans: b. Training Data

17. _____refer to the type of data you want to collect.
a. Data features
b. Exploring Data
c. Data Acquisition
d. All of the above
Ans: a. Data features

18. What are the different ways to collect data?
a. Web Scraping & API
b. Surveys & Sensors
c. Cameras & Observations
d. All of the above
Ans: d. All of the above

19. Sometimes, you use the internet and try to acquire data for your project from some random websites. Such data might not be authentic as its accuracy cannot be proved. Due to this, it becomes necessary to find a _____.
a. Reliable source
b. Random source
c. Unauthorize source

d. All of the above
Ans: a. Reliable source

20. One of the most reliable and authentic sources of information where we can download the authentic data for our project are _____.
a. Private websites
b. Government websites
c. Personal websites
d. None of the above
Ans: b. Government websites

21. The _____ makes the data understandable for humans as we can discover trends and patterns out of it.
a. Random Data
b. Graphical Representation
c. Unstructured Data
d. None of the above
Ans: b. Graphical Representation

22. AI models can be classified as _____.
a. Learning Based
b. Rule Based
c. Both a) and b)
d. None of the above
Ans: c. Both a) and b)

23. Learning Based models can be classified as _____.
a. Machine Learning
b. Deep Learning
c. Both a) and b)
d. None of the above
Ans: c. Both a) and b)

24. AI modelling where the rules are defined by the developer is known as _____.
a. Rule Based Approach
b. Learning based Approach
c. Both a) and b)
d. None of the above
Ans: a. Rule Based Approach

25. _____which tells us about the conditions on the basis of which we can decide
a. Dataset
b. Rule Based
c. Learning based
d. None of the above
Ans: a. Dataset

26. _____ helps to test data so that one can calculate the efficiency and performance of the model.
a. Accuracy
b. Evaluation
c. Precision
d. None of the above
Ans: b. Evaluation

27. Efficiency of the model is calculated on the basis of which parameters.
a. F1 Score >> Recall >> Precision >> Accuracy
b. Accuracy >> Precision >> Recall >> F1 Score
c. Precision >> Accuracy >> F1 Score >> Recall
d. Recall >> Precision >> Accuracy >> F1 Score
Ans: b. Accuracy >> Precision >> Recall >> F1 Score

28. _____ are loosely modelled after how neurons in the human brain behave.
a. Neural networks
b. Neural science
c. Neural Analysis
d. None of the above
Ans: a. Neural networks

29. A secret AI hiring tool was being developed by Amazon. The machine learning experts discovered a significant issue: their new recruiting engine disliked women. The system has already learned that male candidates were preferred. The resumes with "women" on them were punished. As a result, the tool failed. This is an example of _____.
a. Data Privacy
b. AI Access
c. AI Bias
d. Data Exploration
Ans: c. AI Bias

30. Does modeling mean creating an AI model?
a. YES b. NO
Ans: a. YES

31. Can we use AI on mobile phones?
a. YES b. NO
Ans: a. YES

QUESTIONS AND ANSWERS - 1 mark

1. Name all the stages of an AI Project cycle.
Problem Scoping, Data Acquisition, Data Exploration, Modeling, Evaluation

2. What are sustainable development goals?
The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

OR

The Sustainable Development Goals (SDGs) or Global Goals are a collection of 17 interlinked goals designed to be a "blueprint to achieve a better and more sustainable future for all" so that the future generations may live in peace and prosperity.

3. Name the 4Ws of problem canvases under the problem scoping stage of the AI Project Cycle.
a. Who, b. what c. where d. why

4. What is Testing Dataset?
The dataset provided to the model ML. algorithm after training the algorithm

5. Mention the types of learning approaches for AI modeling.
Supervised, unsupervised and re-enforcement

6. What is the objective of evaluation stage?
It is to evaluate whether the ML algorithm is able to predict with high accuracy or not before deployment.

7. Fill in the blank:
The analogy of an Artificial Neural Network can be made with _____? (Parallel Processing)

8. Which of the following is not an authentic source for data acquisition?
a. **Sensors b. Surveys c. Web Scraping d. System Hacking**
System Hacking

9. Which type of graphical representation suits best for continuous type of data like monthly exam scores of a student?
Linear graph

10. Fill in the blank: Neural Network is a mesh of multiple _____.
Hidden Layers / Layers

QUESTIONS AND ANSWERS - 2 marks

1. What are the two different approaches for AI modelling? Define them.

There are two approaches for AI Modelling; Rule Based and Learning Based.
The Rule based approach generates pre-defined outputs based on certain rules programmed by humans. Whereas, machine learning approach has its own rules based on the output and data used to train the models.

OR

Rule Based Approach Refers to the AI modelling where the relationship or patterns in data are defined by the developer. The machine follows the rules or instructions mentioned by the developer, and performs its task accordingly. Whereas in Learning based approach, the relationship or patterns in data are not defined by the developer. In this approach, random data is fed to the machine and it is left to the machine to figure out patterns and trends out of it

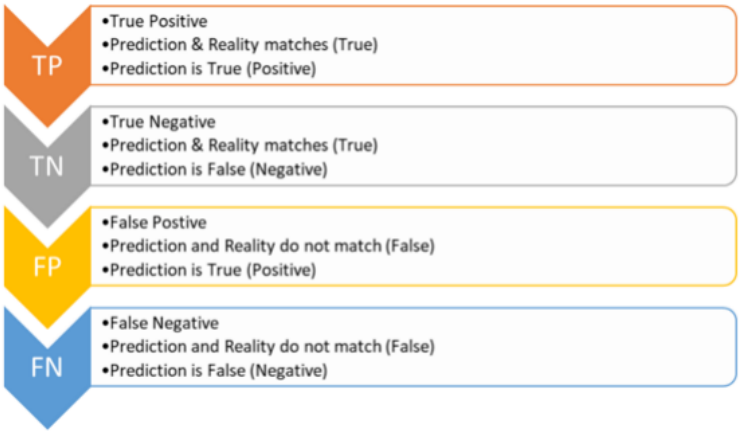
2. What is a problem statement template and what is its significance?

The problem statement template gives a clear idea about the basic framework required to achieve the goal. It is the 4Ws canvas which segregates; what is the problem, where does it arise, who is affected, why is it a problem? It takes us straight to the goal.

3. What do you mean by Data Features?

The type of data to collect,It should be relevant data.

4. What are Model Evaluation Terminologies in evaluation?



5. Explain Data Exploration stage.

In this stage of project cycle, we try to interpret some useful information out of the data we have acquired. For this purpose, we need to explore the data and try to put it uniformly for a better understanding. This stage deals with validating or verification of the collected data and to analyze that:

- The data is according to the specifications decided.
- The data is free from errors.
- The data is meeting our needs.

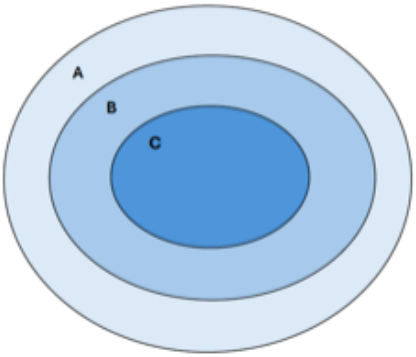
6. What are the features of an Artificial Neural Network?

Any Artificial Neural Network, irrespective of the style and logic of implementation, has a few basic features as given below.

- The Artificial Neural Network systems are modelled on the human brain and nervous system.
- They are able to automatically extract features without feeding the input by programmer.
- Every node of layer in a Neural Network is compulsorily a machine learning algorithm.
- It is very useful to implement when solving problems for very huge datasets.

7. What is deployment?
Deployment as the final stage in the AI project cycle where the AI model or solution is implemented in a real-world scenario.

8. Identify A, B and C in the following diagram (Hint: How AI, ML &DL related to each other)



QUESTIONS AND ANSWERS - 4 marks

1. Explain the AI Project Cycle in detail.
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 project cycle is now complete and what you get is your AI project.

2. Draw the 4Ws problem canvas and explain each one of them briefly.
The 4Ws problem canvas is the basic template while scoping a problem and using this canvas, the picture becomes clearer while we are working to solve it.
a) **Who:** The "Who" block helps you in analyzing the people getting affected directly or indirectly due to it? Under this, you find out who the 'stakeholders' to this problem are and what you know about them. Stakeholders are the people who face this problem and would be benefitted with the solution.

b) **What:** Under the "What" block, you need to look into what you have on hand. At this stage, you need to determine the nature of the problem. What is the problem and how do you know that it is a problem?
c) **Where:** In this block, you need to focus on the context/situation/location of the problem. It will help you look into the situation in which the problem arises, the context of it, and the locations where it is prominent.
d) **Why:** in the "Why" canvas, think about the benefits which the stakeholders would get from the solution and how would it benefit them as well as the society.

3. Write the difference between Ethical and Morals.

Morals	Ethics
▪ **The beliefs dictated by our society.**	▪ **The guiding principles to decide what is good or bad.**
▪ **Morals are not fixed and can be different for different societies.**	▪ **These are values that a person themselves chooses for their life.**
▪ **Examples:** ▪ **Always speak the truth** ▪ **Always be loyal** ▪ **Always be generous**	▪ **Examples:** ▪ **Is it good to speak the truth in all situations?** ▪ **Is it good to be loyal under all circumstances?** ▪ **Is it necessary to always be generous?**

4. What are the principles in AI Ethics that affect the quality of AI solutions
Ans:
- Human Rights
- Bias
- Privacy
- Inclusion

5. How you can figure out the data using problem scoping?
Answer –

- You need to acquire data which will become the base of your project.
- Collect data from various reliable and authentic sources
    - After exploring the patterns, you can decide upon the type of model you would build to achieve the goal.
- 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 improving it.

6. What is Sustainable Development?

Answer – When all renewable resources are utilized properly, the variety of life on earth is conserved, and environmental harm is kept to a minimum for the benefit of future generations, this is considered sustainable development.

According to the Bruntland Commission Report from 1987, sustainable development refers to "development that satisfies present demands without compromising the ability of future generations to meet their own needs."

7. What are the goals of sustainable development?

Answer – There are 17 sustainable development goals announced by the United nations, aim to achieve these goals by the end of 2030 –

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequality
- Sustainable Cities and Communities
- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life on Land
- Peace and Justice Strong Institutions
- Partnerships to achieve the Goal

8. What are the Key Steps in Deployment Process?

The key steps involved in the deployment process:

a. Testing and validation of the AI model

b. Integration of the model with existing systems

c. Monitoring and maintenance of the deployed model.

Some examples of successful AI projects that have been deployed in various industries, such as self driving cars, medical diagnosis systems, and chatbots.

9. What is 4Ws Problem Canvas?

Answer – Who, What, Where, and Why are the 4Ws of problem scoping. These Ws aid in more accurate and effective problem identification and comprehension.

- who : who is facing for problem who are the stakeholders of problem .
- what: what is refer to a asking question .
- where : where is refer to asking about the place where the person was going.
- why: why is refer to a asking about the person like why are you asking question .

10. What is evaluation?

Evaluation is the process of understanding the reliability of any AI model, based on outputs by feeding test dataset into the model and comparing with actual answers.

11. What is data Acquisition?

Answer – The process of gathering correct and trustworthy data to work with is known as data acquisition. The second stage of the project cycle is data acquisition, and for successful decision making, we must make sure the data is gathered from genuine and trustworthy sources.

12. What is the difference between Training Data & Testing Data?

Answer – The datasets are divided into two groups in machine learning. The first subset, referred to as the training data, is a section of our actual dataset that is used to train a machine learning model. Second subset, referred to testing data, Once your machine learning model is built, you need unseen data to test your model. This data is called testing data.

13. What are the various ways to collect data?

Answer – Various ways to collect the data is –

- Surveys
- Web Scraping
- Sensors
- Cameras
- Observations
- Application Program Interface (API)

14. What is data exploration?

Answer – Data exploration is the process of displaying and detecting unique patterns and trends in data using tools and procedures. Data visualization and other complex statistical techniques can be used to do this.

15. What is data modelling?

Answer – Data modelling is the process of developing a visual representation of an entire information system or certain components of it. for example the development, training, and application of machine learning algorithms that simulate logical decision-making based on accessible facts are known as AI modelling.

16. What is Rule Based Approach?

Answer – When the developer sets the rules. The machine executes its duty in accordance with the rules or instructions specified by the developer.

A rule-based artificial intelligence (AI) system is one that aims to develop artificial intelligence (AI) by using a model that is exclusively based on predetermined rules.