INDIAN SCHOOL AL WADI AL KABIR

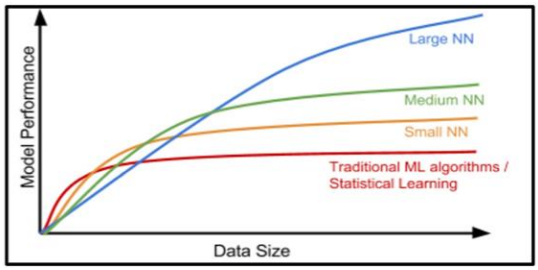
Class: X	Department: Computer Science
WORKSHEET 1- PART B UNIT 2	ARTIFICIAL INTELLIGENCE (417) Part B Unit 2 AI PROJECT CYCLE

1 mark Questions

1. Name all the stages of an AI Project cycle.
   Problem Scoping, Data Acquisition, Data Exploration, Modeling, Evaluation
2. Name the 4Ws of problem canvases under the problem scoping stage of the AI Project Cycle.
   a. Who, b. what c. where d. why
3. What is Testing Dataset?
   The dataset provided to the model ML. algorithm after training the algorithm

4. Statment1: There are four layers in a neural network.
   Statement2:The first layer of the neural network is known as the output layer.
   (a) Both Statement1 and Statement2 are correct
   (b) Both Statement1 and Statement2 are incorrect
   (c) Statement1 is correct but Statement2 is incorrect
   (d) Statement2 is correct but Statement1 is incorrect

5. Observe the given graph and fill in the blank: **Larger** the neural network, better is the performance.



6. Srishti learnt about AI terminologies but was not able to recollect the term that is used to refer to machines that perform tasks with vast amounts of data using neural networks. Help her with the correct term. **Ans: Deep Learning**

7. Deep learning is a subset of Machine Learning.
   a) **True** b)False c)N/A

8. **Data Features/Data** refer to the type of features that we want to collect.

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

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

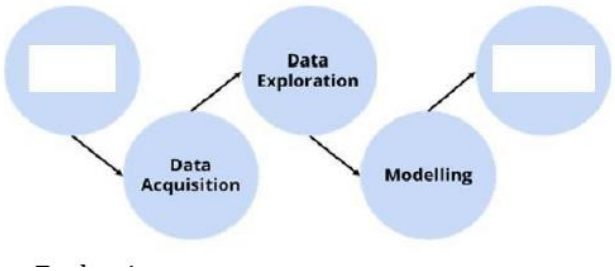
11. Which type of graphical representation suits best for continuous type of data like monthly exam scores of a student? **Line graph**
12. _____ helps us to summaries all the key points into one single Template so that in future, whenever there is a need to look back at the basis of the problem, we can take a look at this and understand the key elements of it. **Ans: Problem Statement Template**
13. Divya was learning neural networks. She understood that there were three layers in a neural network. Help her identify the layer that does processing in the neural network.
    (a) Output layer (**b) Hidden layer (c**) Input layer (d) Data layer
14. Smita is working on a project that involves over a lakh of records. Which of the following should she use to make the best project?
    (a) Traditional programming (b) Manual processing (c) IoT **(d) Neural networks**
15. For better efficiency of an AI project Training data should be _____
    i) Relevant ii) Scattered iii) Structured iv) Authentic

    Choose the correct option: (a) Both i and ii (b) **Both i and iv** (c) Only i (d) Only iv

2 Mark Questions

16. 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.

17. Mention the precautions to be taken while acquiring data for developing an AI Project.
    It should be from an authentic source, and accurate. Look for redundant and irrelevant data parameters that does not take part in prediction.
18. What do you mean by Data Features?
    The type of data to collect, It should be relevant data.
19. Write the names for missing stages in the given AI project cycle:
    Problem Scoping, Evaluation



20. Differentiate Structured and unstructured data

    Structured Data:

    • Structured data is categorized as quantitative data.

    • Structured data has predefined data types and format so that it fits well in the column/fields of database or spreadsheet.

    • They are highly organised and easily analysed.

    • Examples of Structured data are: Name, age, address, cricket score board, school time table etc.

    Unstructured Data:

    • Unstructured data is categorized as qualitative data.

    • Unstructured data is difficult to deconstruct because it has no predefined model, meaning it cannot be organized in relational databases.

    • Examples of unstructured data include text, video, audio, mobile activity, social media activity, satellite imagery, surveillance imagery and the list go on.

21. Differentiate between training and testing data.

Training data	Test Data
A training dataset is a database of examples used during the learning process and is used to fit the parameters.	A test set is set of example used only to access the performance the fully specified classifier.
Maximum part of the dataset comes under training data (Usually 80%).	A very little part of dataset is used for test data (Usually 20%).

22. 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.

23. What is the purpose of getting AI Ready?

The world is changing with each day and we have huge data coming our way. The purpose of getting AI ready means taking steps to collect data around relevant systems, equipment, and procedures; and storing and curating that data in a way that makes it easily accessible to others for use in future AI applications.

OR

The purpose of getting AI ready specifies the responsible and optimum use of huge amount of data around us to create and implement into such systems and applications which should make life of future generations more organized and sustainable. This process may lead to better lives for mankind.

24. What are the different types of sources of data from where we can collect reliable and authentic datasets? Explain in brief.

Data can be a piece of information or facts and statistics collected together for reference or analysis. Whenever we want an AI project to be able to predict an output, we need to train it first using data There could be many ways and sources from where we can collect reliable and authentic datasets namely Surveys, Web scrapping, Sensors, Cameras, Observations, Research, Investigation, API etc. Sometimes Internet is also used to acquire data but the most important point to keep in mind is that the data should be taken from reliable and authentic websites only. Some reliable data sources are UN, Google scholar, Finance, CIA, Data.gov etc.

25. What do you mean by system maps?

-System maps help us to find the relationship between the elements of the problem which we have scoped

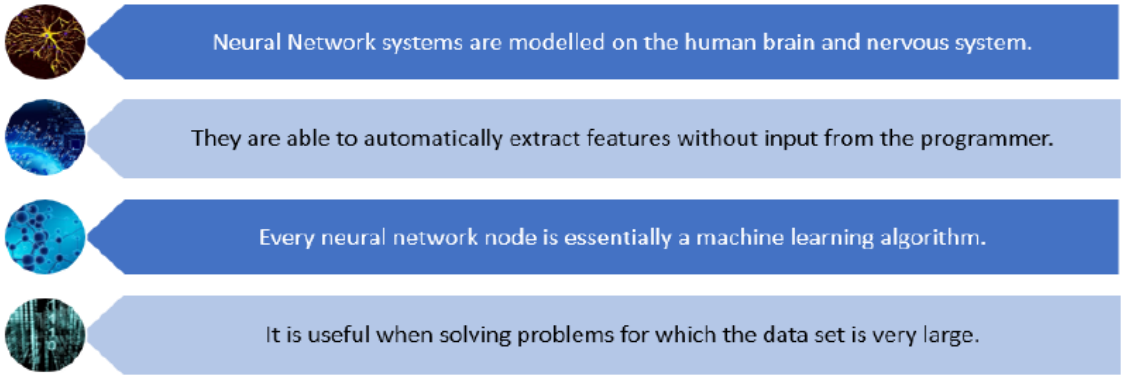
-A system map shows the components and boundary of a system and the components of the environment at a point in time.

-The main use of a system map is to help structure a system and communicate the result to others.

- It helps us in strategizing the solution for achieving the goal of our project.

-help to understand complex issues with multiple factors that affect each other

26. What are the features of Neural Network



4 Mark Questions

27. **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.

28. **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.

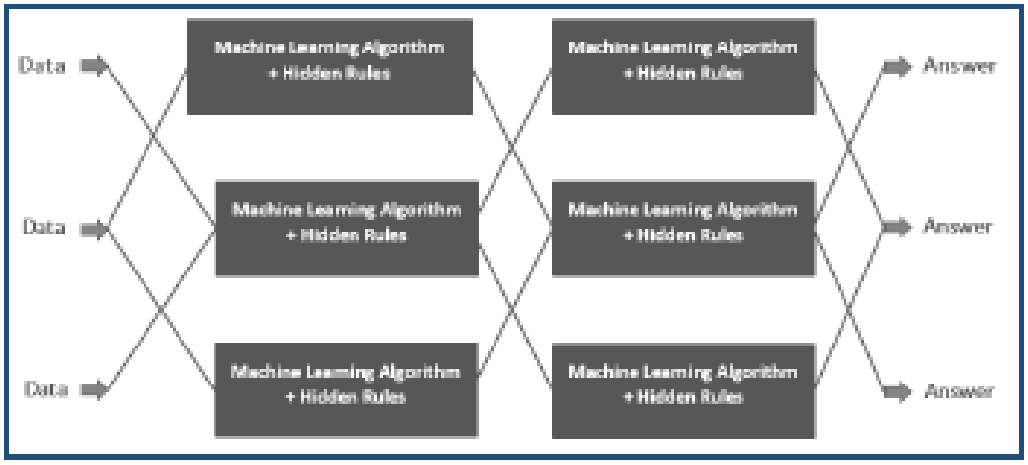
a) Who: The “Who” block helps you in analyzing the people getting affected directly or indirectly due to it? Under this, you find out who the ‘stakeholders’ to this problem are and what you know about them. Stakeholders are the people who face this problem and would be benefitted with the solution.

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.

29. **What is the need of an AI Project Cycle? Explain.**
    Project cycle is the process of planning, organizing, coordinating, and finally developing a project effectively throughout its phases, from planning through execution then completion and review to achieve pre-defined objectives. Our mind makes up plans for every task which we have to accomplish which is why things become clearer in our mind. Similarly, if we have to develop an AI project, the AI Project Cycle provides us with an appropriate framework which can lead us towards the goal.
    The major role of AI Project Cycle is to distribute the development of AI project in various stages so that the development becomes easier, clearly understandable and the steps / stages should become more specific to efficiently get the best possible output. It mainly has 5 ordered stages which distribute the entire development in specific and clear steps: These are Problem Scoping, Data Acquisition, Data Exploration, Modelling and Evaluation.
30. **Explain the structure of Artificial Neural network**



- This is a representation of how neural networks work. A Neural Network is divided into multiple layers and each layer is further divided into several blocks called nodes.
- Each node has its own task to accomplish which is then passed to the next layer.
- The first layer of a Neural Network is known as the input layer. The job of an input layer is to acquire data and feed it to the Neural Network. No processing occurs at the input layer.
- Next to it, are the hidden layers. Hidden layers are the layers in which the whole processing occurs. Their name essentially means that these layers are hidden and are not visible to the user. Each node of these hidden layers has its own machine learning algorithm which it executes on the data received from the input layer.
- The processed output is then fed to the subsequent hidden layer of the network.
- There can be multiple hidden layers in a neural network system and their number depends upon the complexity of the function for which the network has been configured. Also, the number of nodes in each layer can vary accordingly.
- The last hidden layer passes the final processed data to the output layer which then gives it to the user as the final output.
- Similar to the input layer, output layer too does not process the data which it acquires. It is meant for user-interface.

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