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Department of Biomedical Engineering

Course Name: 19ECT303 & Artificial Intelligence and machine learning
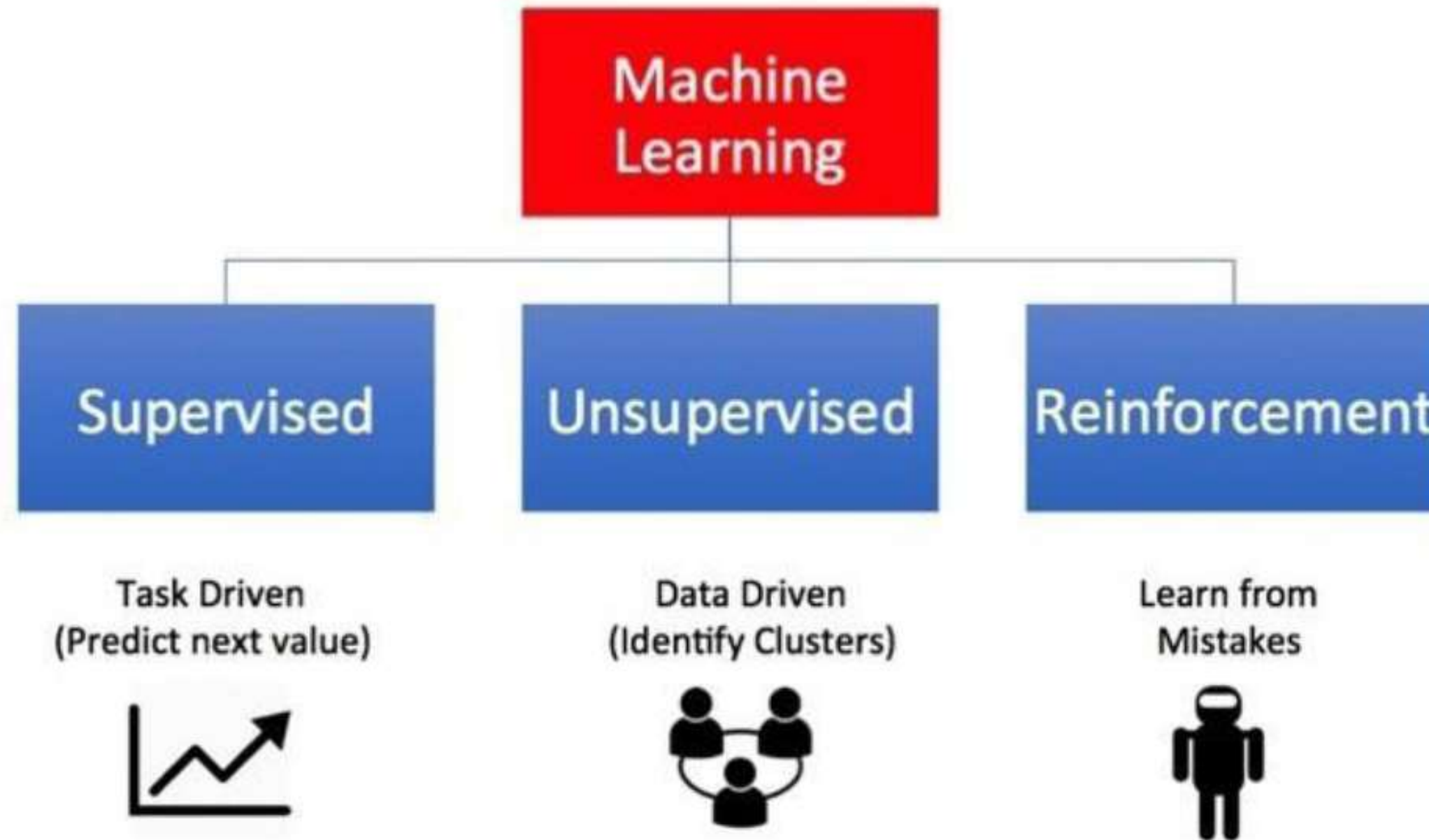
III Year : V Semester

Unit I –FUNDAMENTALS OF MACHINE LEARNING

Topic : Types of Machine Learning and Machine learning process

Types of Machine Learning

Supervised Learning

- Trained using labelled data

- Training data set- small part of big dataset

- Finds relationship between variables- Cause and effect relationship and learns about relation between i/p and o/p

- Finally applied to Testing dataset

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UnSupervised Learning

- Works with unlabelled data
- Relationships between data points perceived in an abstract manner
- There is a hidden structure between i/p and o/p
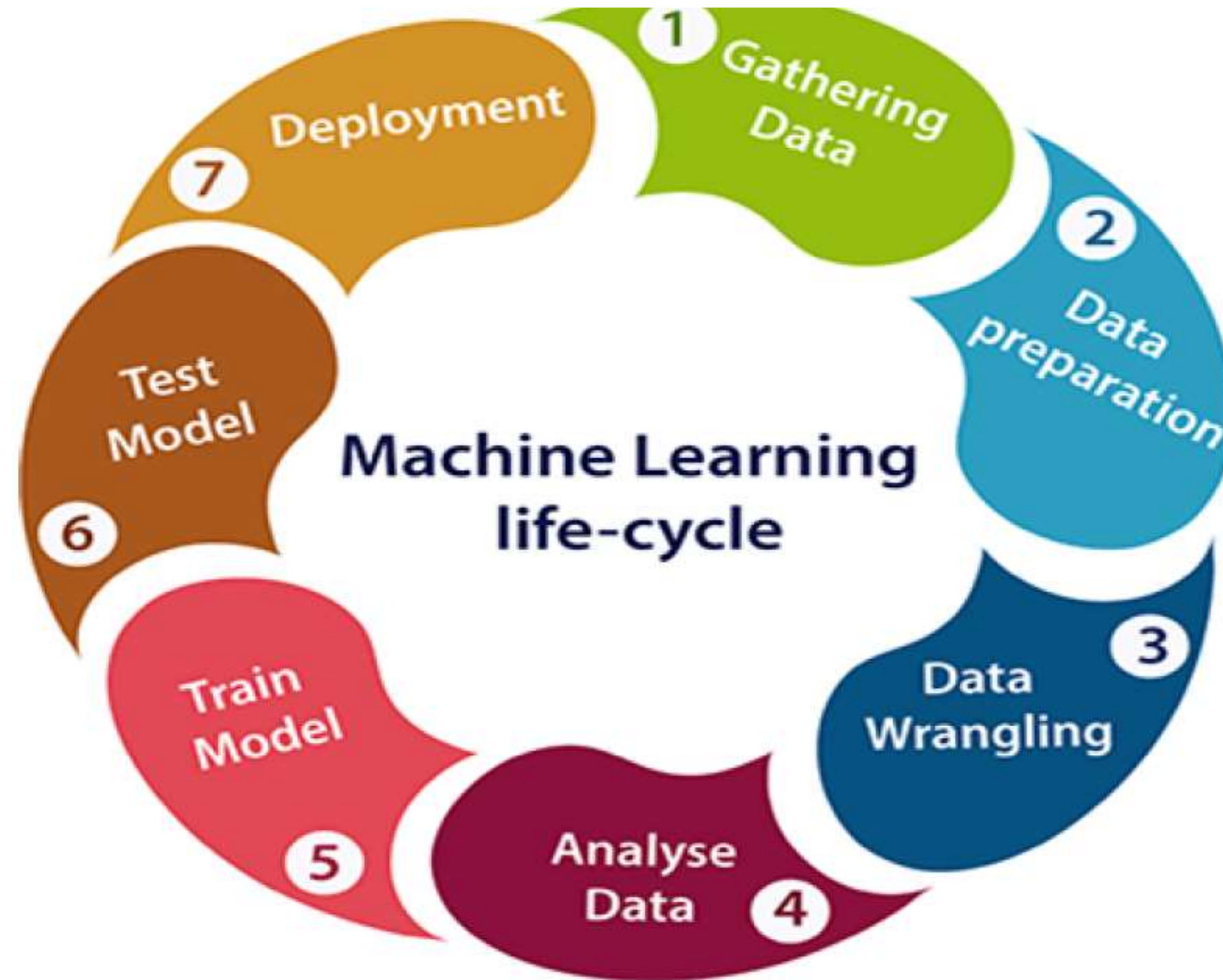
Reinforcement Learning

- Inspiration from Human perception
- Trial-and –error method
- Favorable outputs- Encouraged or reinforced
- Non favorable outputs- Discouraged or "Punished"
- Interpreter and reward system
- Score of effectiveness

Machine learning Process

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Gathering data

- Data collection
- Identification of data sources

Data Preparation

• Data preparation is a step where we put our data into a suitable place and prepare it to use in our machine learning training.

•Ordering of data

•Data exploration

•Data pre-processing

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Data Wrangling

• process of cleaning and converting raw data into a useable format

•It is the process of cleaning the data, selecting the variable to use, and transforming the data in a proper format to make it more suitable for analysis in the next step

•Issues in data:

Missing Values

Duplicate data

Invalid data

Noise

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Data Analysis

- Selection of analytical techniques
- Building models
- Review the result

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Train the model

• we train our model to improve its performance for better outcome of the problem

•We use datasets to train the model using various machine learning algorithms. Training a model is required so that it can understand the various patterns, rules, and, features.

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Test model

- Once our machine learning model has been trained on a given dataset, then we test the model.
- In this step, we check for the accuracy of our model by providing a test dataset to it.
- Testing the model determines the percentage accuracy of the model as per the requirement of project or problem.

Deployment

• The last step of machine learning life cycle is deployment, where we deploy the model in the real-world system.

• If the above-prepared model is producing an accurate result as per our requirement with acceptable speed, then we deploy the model in the real system.

•But before deploying the project, we will check whether it is improving its performance using available data or not. The deployment phase is similar to making the final report for a project.

Think and answer !!!

Consider that you are going to create a machine learning model for diagnosing arrhythmia from the ECG of a person. Identify the data source and the ways you can get it.

The below table gives the information about the task and its time. Identify the problem with this data and what corrections need to be done. Note that no new data addition is required.

Task	Time
Breakfast	8.00 AM
Wake up	5.00 AM
Reach office	9.00 AM
Lunch break at office	1.00 PM
Tomato price	Rs 60
Tea break	15.30 PM
Leaving office	4.00 PM

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In a x and y coordinate system, there are two data points, A(1,2) and B(3,2). Calculate the distance between A and B.

THANK YOU

QUESTIONS ??