



JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA

PGDM / PGDM (M) / PGDM (SM)

VI TERM (Batch 2021-23)

END TERM EXAMINATIONS, April 2023

Reappear

| | | | |
|-------------|-------------------------|-------------|-------|
| Course Name | Artificial Intelligence | Course Code | 20829 |
| Max. Time | 2 Hours | Max. Marks | 40 MM |

INSTRUCTIONS: (Read them very carefully)

- The mode of the paper is pen and paper.
- All questions are compulsory.
- For question 2, analyze the case in Jupyter Notebook on Python and answer the given questions on the answer sheet provided to you.

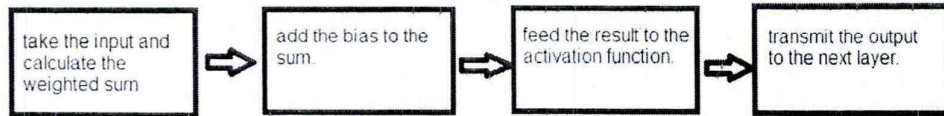
- The CreditTake Bank provides personal loans to the customers. The past trends of recovery of loans were marked unsatisfactory in the previous financial year. The bank has maintained database of all its customers. The snippet of the data is given below:

| S No | Credit_duration(in months) | Installment rate | Amount | Credit Status |
|------|----------------------------|------------------|--------|---------------|
| 1 | 6 | 4 | 4469 | Bad |
| 2 | 48 | 2 | 5090 | Bad |
| 3 | 12 | 2 | 3078 | Good |
| 4 | 42 | 2 | 7000 | Bad |
| 5 | 24 | 3 | 6287 | Good |

The loan officer is planning to have a strategy to decide on which customers should be provided loan or not . Loan officer is planning to have a meeting with business analyst to know if there is a way in which data can be used for finding out the potential customers for loan. Answer the following questions based on the above information.

(5 * 3 = 15marks)

- Suppose you are the Business Analyst for the company, plan how the problem of loan officer can be modelled using the given data.
- The basic process carried out by a neuron in neural network is



Combine the above said approach in your strategy as a long term solution for finding the good customers. Discuss the activation functions. Elaborate on the need of activation function in neural network.

- c) Choose the right activation function for solving the above problem with the light on the advantages and disadvantages of the chosen activation function.
2. Jewar airport is ready for its operations, the CEO of a real estate company is interested in knowing the future worth of properties in nearby areas for making a good investment. The data for different houses has been maintained by his IT team. Suppose you are the Data Scientist at this company and you have been asked to derive a data driven approach for predicting the prices. The data provided to you in the file house_data.csv. The data has many features which are given below:

| Variable | Variable Description |
|---------------|--|
| Date | Date house was sold |
| Price | Price of house |
| Bedrooms | Number of Bedrooms/House |
| Bathrooms | Number of bathrooms/House |
| Sqft Living | square footage of the home |
| Sqft Lot | square footage of the lot |
| Floors | Total floors (levels) in house |
| Waterfront | House which has a view to a waterfront |
| View | Has been viewed |
| Condition | How good the condition is (Overall) |
| Grade | grade given to the housing unit |
| Sqft Above | square footage of house apart from basement |
| Sqft Basement | square footage of the basement |
| Yr Built | Built Year |
| Yr Renovated | Year when house was renovated |
| Zipcode | Zip |
| Lat | Latitude coordinate |
| Long | Longitude coordinate |
| Sqft Living | Living room area in 2015(implies — some renovations) |
| Sqft Lot15 | lotSize area in 2015(implies — some renovations) |

Analyze the case using python and answer the following questions: (5 * 5 = 25marks)

- Design model building process of the above problem.
- Interpret your observations of exploratory data analysis.
- Estimate the features and coefficients in both the models. Explain the algorithm for the estimation.

- d) Fine tune the hyperparameters for neural network. Defend your selection of hyperparameters with the loss function plot.(Roughly draw the plot you get using python on paper)
- e) Propose the best model for prediction with supporting reasons.