I Semester M.E (Big Data Analytics)

BDA 5153 Fundamentals of Machine Learning Lab

Midterm Lab Exam October 2024

Date: 8th October 2024 (10.45 am – 12.15 pm)

Max: 30 Marks   Duration: 180 minutes

[1] Use Numpy and Pandas to generate an array of 100 numbers from 0 to 99. Convert it into a matrix of size 10 x 10 and do the following: (8 Marks) [CO1 BL3]

1. Find the element at 3rd row 4th column

2. Print 21, 22, 23

3. Print all the rows up to row 3 and all the columns up to (and not including) the last column

4. Print every other element in the last row

5. Print all values from the array that are greater than 90.

6. Assign all values in the array that are greater than 90 to the value of 90

7. Copy the 10 x 10 array to another array and set all the values of copied array to 7

[2] Use lambda function to find the square of the number n= (10, 20, 30, 40)   2 Marks
[CO1 BL3]

[3] Use the data set "*Customer Purchasing Behaviors.csv*" to do the following   20 Marks
[CO1 BL3 – Apply Linear regression 5 marks & CO2 BL4 – Analysis of the result 15 marks]

About Dataset

customer_id: Unique ID of the customer.
age: The age of the customer.
annual_income: The customer's annual income (in USD).
purchase_amount: The total amount of purchases made by the customer (in USD).
purchase_frequency: Frequency of customer purchases (number of times per year).
region: The region where the customer lives (North, South, East, West).
loyalty_score: Customer's loyalty score (a value between 0-100).

This dataset includes information on customer profiles and their purchasing behaviours. The data features columns for user ID, age, annual income, purchase amount, loyalty score, region, and purchase frequency.

Apply linear regression to analyse the relationship between the following:

    (a) age and annual_income
    (b) age and purchase_amount
    (c) annual_income and purchase_amount
    (d) purchase_amount and purchase_frequency
    (e) annual_income and purchase_frequency

How can this data analysis help in identifying tasks related to customer behaviour and market research. Justify your answer.