Indian Institute of Space Science and Technology – Thiruvananthapuram

MA632 Data Modeling Lab I

Assignment-V

1. Generate the following data as per the given conditions and save in a folder.
   (a) Classification problem: p(x/y =k) follows multivariate Gaussian distribution with different mean but same covariance for each class. Each attribute follows normal distribution. Number of attributes:3, Number of data points:1000.
      i. Number of classes:2
      ii. Number of classes:3
   (b) Classification problem: p(x/y =k) follows multivariate Gaussian distribution with different mean and difference covariance for each class. Each attribute follows normal distribution. Number of attributes:3, Number of data points:1000.
      i. Number of classes:2
      ii. Number of classes:3
   (c) Classification problem: p(x/y=k) is conditionally independent given y, Discrete attributes, Number of attributes:3, Number of classes:3, Number of data points:1000.
   (d) Classification problem: p(x/y=k) follows Multinomial distribution, Discrete attributes, Number of attributes:3, Number of classes:3, Number of data points:1000.
2. Download Lenna image.
   (a) Get the height and width of the image.
   (b) Apply a border to the image.
   (c) Find the aspect ratio of the image.
   (d) Resize the image without changing the aspect ratio.
3. Write a function that perform the following task: Display a screen with the following contents: (a) IIST logo and name: "IIST", (b) current time and current date (c) name of the current day of the week.

4. Write a function that display the name of the operating system you are using and its related information.,

5. Write a function that perform the following task: Create a folder f_1 in the current directory. Inside f_1 create five folders and five files. Inside those five folders create 3 folders and 6 files. Display the names of the all the contents created inside f_1.

6. Write a function for the following task:
   (a) Store the following items in a deque data structure: *Apple, Orange, Lemon, 20, 40*.
   (b) Add *5* in the beginning of deque.
   (c) Add *Mango* at the end of deque.
   (d) Reverse the order of deque.

7. Write a function to print (a) path of the current directory (b) subdirectories in a given directory.

8. Write a function for the following task: Print the calender details of November 2022.

9. Write a program for the following tasks:
   (a) Connect a machine to a given host and port.
   (b) Read any available data from the socket and then exit.

10. Write a program for the following tasks:
    (a) Ask the user to enter a name for creating a file. Using that name create a file in the current directory.
    (b) Ask the user to enter the details for storing in the file. Store those details in the file.
    (c) Print the number of words in the file.
    (d) Write the program using try-except syntax: Ask the user to enter an integer n. Read the n^{th} line from the file. Raise an error if line is not found.
    (e) Ask the user to enter a digit n. Print the first n lines from the file. Print the last n lines of the file. Raise an error if lines are not found.
    (f) Print the longest word in the file.
    (g) Print all the lines in the file.

(h) Count the frequency of each word in the file.

(i) Copy the contents of the file to another file.

(j) Save the contents in the file in (a) an array (b) a list.

(k) Write the syntax to close the file.

11. Perform the following tasks:

    (a) Store the following in a dictionary: *Attribute 1*: Height, *Attribute 2: Weight*, *Attribute 3: Colour*, *Attribute 4: Density*. Create a panda series from the dictionary.

    (b) Store the following in a list: *170, 70, Red, 32*. Create a panda series from the list.

    (c) Create a DataFrame from the two panda series created.