Video : https://drive.google.com/drive/folders/1CCPgLY40DmIOH7hVmoTLlZre6bItm5Mu?usp=sharing

**Question 1:**

-The list ages is given. I have been asked to sort the list and find the maximum and minimum age.

I sorted the list using the sort() function and used max() and min() functions in python to find the maximum and minimum age present in the list.

-I have been asked to add the minimum and maximum age to my original list which I did using the append function which adds new values to the list.

-Then I have been asked to find the median.

The median means the middle element if the number of elements is odd and the sum of 2 middle elements if the number is even. I used a mod operator the length of the list and then used if else to calculate the median for odd and even elements

-Then I have been asked to find the average of the list.

The average if the sum of total elements divided by the total no. of inputs. I have used a for loop to calculate the sum of elements and then divided it by the total no. of elements in the list

-Finally I have been asked to get the range of the list. Range is defined as the difference of maximum element and the minimum element in the list. Which I have done in the code. I have attached my screenshot for your reference.

Graphical user interface, text, application, email

Description automatically generated

**Graphical user interface, text, application, email

Description automatically generated**

**Question 2**

-I have initialized an empty dictionary named dog. Then later added the attributes of Dog as asked.

-Then I initialized a dictionary named student and entered it’s attributes.

-I have been asked to calculate the length of the dictionary which I did by using the built in function len(student). This **len** function gives the length of the dictionary in python.

-Then I have been asked to print the values of the key skills in the student dictionary.

I did the same using the keyword student[“skills”]. Giving the key to the dictionary gives out the value or values present in the key.

-Next I have been asked to specify the data type of the key skills.

I used the built in function type which gives out the data type of the variable.

-Next I have used append keyword to add values to my key skills and then print all the keys in the dictionary. For this I used the student\_keys command which lists out all the keys in a dictionary.

-Finally I have been asked to give the values of the dictionary as a list for which I used student\_values.

Graphical user interface, text, application, email

Description automatically generated

**Question 3**

-First I hav been asked to create a tupple of brothers and sisters which I did. A tupple creation in python is done by using small brackets().

-Next I added values to it.

-Next, I have been asked to join the two tupples and name it siblings. Joining the two tuples is simple using the + sign as if 2 data types are same, we can join the two data structures in python.

-I have been asked to give the total no. of siblings which I gave out by using function len.

-Next I have been asked to create a new tupple family members which has the data of siblings and then add my father’s and mother’s name in it.I did this by using the + sign again.

Graphical user interface, text, application

Description automatically generated

**Question 10**

Here 2 classes are given. So I will use the 1st class for training and 2nd class for testing my model.

Training Data:

|  |  |
| --- | --- |
| 1 | O |
| 2 | O |
| 3 | X |
| 6 | X |

KNN is given 3, Therefore I must find the 3 nearest neighbors of it.

For Point 6:

Nearest neighbors are 2=O, 3=X and 6=X.

Hence the prediction in testing set is X

For Point 7:

Nearest neighbors are 3=O, 6=X and 6=X.

Hence the prediction in testing set is X

For Point 10:

Nearest neighbors are 6=X, 6=X and 7=X.

Hence the prediction in testing set is X

For Point 11:

Nearest neighbors are 6=X, 7=X and 10=X.

Hence the prediction in testing set is X

Here, Let

O be positive and X be negative

The testing set or the confusion matrix is depicted as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Data Set | Actual Output | Predicted Output | TP/TN/FP/FN |
| 6 | X | X | TN |
| 7 | O | X | FN |
| 10 | O | X | FN |
| 11 | O | X | FN |

Therefore,

TP = 0, TN = 1, FP = 0, FN = 3

Now I have been asked to calculate the accuracy. For this I have used the formula,

Accuracy = (TP/TN) / (P+N)

=0 + 1 / 3 + 1

=1/4

Sensitivity is calculated by,

Sensitivity = TP/P

=0

Specificity is calculated by the formula,

Specificity = TN/N

=1