Name - Srushti Bhivaji Salgar
PRN - B24CE1079
Subject - Mathematical Foundation for GenAI
ASSIGNMENT 6 - Measures of Central Tendency

PROGRAM

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/*PROBLEM STATEMENT:
A teacher wants to analyze the performance of students in a recent examination. To understand the overall class achievement and identify trends in student performance, the teacher needs to calculate the measures of central tendency specifically, the mean, mode, and median from the student score data.*/

#include<iostream>
using namespace std;
int main() {
        int i,j,n;

 //Input the no.of students and their scores
 cout<<"Enter the number of students:";
 cin>>n;
 int arr[n];

 cout<<"\nEnter the scores of "<<n<<" students"<<endl;
 for(i=0;i<n;i++) {
        cout<<"Enter score of student "<<i+1<<": ";
        cin>>arr[i];
        }

 //Calculating Mean
 float sum = 0;
 for (int i=0;i<n;i++) {
        sum += arr[i]; //Sum of array elements
        }

 float mean = sum/n;
 cout<<"\nMean of the scores: "<<mean<<endl;

 //Calculating Mode
 int maxcount=0;
 int mode=arr[0]; //stores element with highest frequency
 for(i=0;i<n;i++) {
        int count = 0;
 for(j=0;j<n;j++) {
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        if(arr[j]==arr[i]) {
                count++;
                }
}
if (count>maxcount) {
        maxcount=count;
        mode=arr[i];    //storing element having highest frequency
        }
}
if(maxcount == 1) {
        cout<<"Mode is 1"<<endl;
        } else {
                cout<<"Mode: "<<mode<<endl;
                }

//Calculating Median
//Using bubble sort to sort the array
int temp;
for(i=0;i<n;i++) {
        for(j=0;j<n-i-1;j++) {
                if(arr[j]>arr[j+1]) {
                        temp=arr[j];
                        arr[j]=arr[j+1];
                        arr[j+1]=temp;
                        }
                }
        }

float median;
if(n%2==0) {
median = (arr[(n/2)-1] + arr[n/2])/2 ;
} else {
median = arr[n/2];
}
cout<<"Median of scores: "<<median<<endl;

return 0;
}
```

OUTPUT

```
Enter the number of students:5

Enter the scores of 5 students
Enter score of student 1: 12
Enter score of student 2: 45
Enter score of student 3: 12
Enter score of student 4: 30
Enter score of student 5: 24

Mean of the scores: 24.6
Mode: 12
Median of scores: 24
```

```
Enter the number of students:8

Enter the scores of 8 students
Enter score of student 1: 12
Enter score of student 2: 34
Enter score of student 3: 20
Enter score of student 4: 65
Enter score of student 5: 54
Enter score of student 6: 80
Enter score of student 7: 43
Enter score of student 8: 43

Mean of the scores: 43.875
Mode: 43
Median of scores: 43
```