

# Fundamentals of Programing

## Lab Manual # 10

**Lab Instructor:** Muhammad Affan

**Student Name:** Ahmad Aleem Akhtar

**CMS ID:** 458945

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## Task 1:

```
(globals)
Untitled1.cpp x
1  #include<iostream>
2  #include<vector>
3  using namespace std;
4  int main()
5  {
6      vector<int> v1(10);
7      vector<int> :: iterator i;
8      cout<<"Enter 10 integers: ";
9      for(i=v1.begin(); i!=v1.end();i++)
10         cin>>*i;
11      v1.push_back(5);
12      cout<<"The vector after push back is: ";
13      for(i=v1.begin(); i!=v1.end();i++)
14         cout<<*i<<" ";
15      cout<<endl;
16      v1.erase(v1.begin()+4);
17      cout<<"The vector after erasing the element at 5th position is: "<<endl;
18      for(i=v1.begin(); i!=v1.end();i++)
19         cout<<*i<<" |";
20      return 0;
21 }
```

## Output:

```
C:\Users\PMLS\Desktop\Untitled1.exe
Enter 10 integers: 12
45
32
6
71
24
4
7
89
3
5
The vector after push back is: 12 45 32 6 71 24 4 7 89 3 5
The vector after erasing the element at 5th position is:
12 45 32 6 24 4 7 89 3 5
-----
Process exited after 11.86 seconds with return value 0
Press any key to continue . . .
```

## Task 2:

```
Untitled1.cpp  x  Untitled2.cpp  x
1  #include<iostream>
2  #include<vector>
3  #include<string>
4  using namespace std;
5  int main()
6  {
7      int n, i, j, sum, mode, median, temp;
8      double mean;
9      cout<<"Enter the number of students: ";
10     cin>>n;
11     int rep[n]={0};
12     vector<string> names(n);
13     vector<int> grade(n);
14     for(int i=0;i<n;i++)
15     {
16         cout<<"Enter the name of the student: ";
17         cin>>names[i];
18         cout<<"Enter the grade of the student: ";
19         cin>>grade[i];
20     }
21     for(int i=0;i<n;i++)
22         sum+=grade[i];
23     mean=(double)sum/n;
24     cout<<"The mean grade is: "<<mean<<endl;
25
26     for(j=0;j<n;j++)
27         for(i=j+1;i<n;i++)
28             if(grade[j]==grade[i])
29                 rep[j]++;
30
31     mode=0;
32     for(j=1;j<n;j++)
33         if(rep[j]>rep[mode])
34             mode=j;
35     cout<<"The mode is: "<<grade[mode]<<endl;
36     cout<<" The students with the mode as their grade are: "<<endl;
```

```

Untitled1.cpp  ×  Untitled2.cpp  ×
23     mean=(double)sum/n;
24     cout<<"The mean grade is: "<<mean<<endl;
25
26     for(j=0;j<n;j++)
27         for(i=j+1;i<n;i++)
28             if(grade[j]==grade[i])
29                 rep[j]++;
30
31     mode=0;
32     for(j=1;j<n;j++)
33         if(rep[j]>rep[mode])
34             mode=j;
35     cout<<"The mode is: "<<grade[mode]<<endl;
36     cout<<" The students with the mode as their grade are: "<<endl;
37     for(i=0;i<n;i++)
38         if(grade[i]==grade[mode])
39             cout<<names[i]<<endl;
40
41     for(i=0;i<n;i++)
42     {
43         for(j=0;j<n;j++)
44             if(grade[j]>grade[j+1]){
45                 temp=grade[j];
46                 grade[j]=grade[j+1];
47                 grade[j+1]=temp;
48             }
49     }
50     if(n%2==0)
51         cout<<"The median grade is: "<<(double)((grade[n/2]+grade[(n/2)+1])/2);
52     else
53         cout<<"The median grade is: "<<grade[(n/2)+1];
54     return 0;
55
56
57 }

```

## Output:

```
C:\Users\PMLS\Desktop\Untitled2.exe
Enter the number of students: 5
Enter the name of the student: ali
Enter the grade of the student: 34
Enter the name of the student: hamza
Enter the grade of the student: 44
Enter the name of the student: shayan
Enter the grade of the student: 37
Enter the name of the student: fahad
Enter the grade of the student: 44
Enter the name of the student: harris
Enter the grade of the student: 47
The mean grade is: 41.2
The mode is: 44
The students with the mode as their grade are:
hamza
fahad
The median grade is: 44
-----
Process exited after 26.17 seconds with return value 0
Press any key to continue . . .
```