

CLASSWORK APPLICATIONS FOR ONEDIMENSIONAL ARRAYS

Q1. Write a program to calculate the value of the following function:

$$f(x) = x^2$$

For x values from -5 to 5 with an increment of 0.5. Store the values of x and f(x) to one dimensional arrays. Then plot the data in Ms. EXCEL.

Copy x and fx columns in the output window, paste them to the Ms. EXCEL Sheet and plot the graph.

```
1  #include <iostream>
2  #include <iomanip>
3  using namespace std;
4
5  int main () {
6      double x=-5, a[21],f[21];
7      for(int i=0;i<21;i++){
8          a[i]=x;
9          f[i]=x*x;
10         x+=0.5;
11         cout<<"x "<<setw(5)<<a[i]<<" f "<<setw(5)<<f[i]<<endl;
12     }
13 }
```

Q2. Write a program to calculate the integral of the function which is given in the previous question by considering the area under the function.

```
1  #include <iostream>
2  #include <iomanip>
3  using namespace std;
4
5  int main () {
6      double x=-5, a[21],f[21],fi[21];
7      for(int i=0;i<21;i++){
8          a[i]=x;
9          f[i]=x*x;
10         fi[i]=x*x*x/3;
11         x+=0.5;
12         cout<<"x "<<setw(5)<<a[i]<<" f "<<setw(5)<<f[i]
13         <<" fi "<<setw(5)<<fi[i]<<endl;
14     }
15 }
```

Q3. Write a program that can detect if a given array is sorted or not. To test your work, use the following list:

1.2
3.4
3.7
2.8
6.9

Your program should display that “the list is not sorted for the given example!”

```
1  #include <iostream>
2  #include <iomanip>
3  using namespace std;
4
5  int main () {
6      double a[5];
7      for(int i=0;i<5;i++){
8          cin>>a[i];
9      }
10     for(int i=0;i<4;i++){
11         if(a[i]>a[i+1]){ cout<<"The list is not sorted"<<endl;
12             break;}
13 }
```

Q4. Write a program to sort a given five different number from keyboard.

```
1  #include<iostream>
2  using namespace std;
3  int main(){
4      double a[5];
5
6      for(int i=0;i<5;i++){
7          cin>>a[i];
8      }
9
10     for(int i=0;i<5;i++){
11         for(int j=i+1;j<5;j++){
12
13             if(a[i]>a[j]){
14                 int sort;
15                 sort=a[i];
16                 a[i]=a[j];
17                 a[j]=sort;
18             }
19         }
20     }
21     for(int i=0;i<5;i++){
22         cout<<a[i];
23     }
24 }
```