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Lab13
Subject - OOP lab
Class - B14
Branch - CSE
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Question 1) WAP to find sort an integer array and a float array, using function template.

```
#include <iostream>
using namespace std;

template <class T>
void sorting(int size, T arr[])
{
   T temp;
   for (int i = 0; i < size; i++)
   {
      for (int j = 0; j < size - 1; j++)
      {
         if (arr[j] > arr[i])
         {
            temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
         }
      }
   }
}

template <class T>
void DisplayArray(int size, T arr[])
{
   for (int i = 0; i < size; i++)
      cout << arr[i] << " ";
}

int main()
{
   int n;
   cout << "Enter size  of the (int)array: ";
   cin >> n;
   int arr1[n];

   cout << "Enter the elements: \n";
   for (int i = 0; i < n; i++)
      cin >> arr1[i];
   sorting(n, arr1);
   DisplayArray(n, arr1);

   cout << "\nEnter size of the (float)array: ";
   cin >> n;
   float arr2[n];

   cout << "Enter the elements: \n";
```

```
    for (int i = 0; i < n; i++)
        cin >> arr2[i];
    sorting(n, arr2);
    DisplayArray(n, arr2);

    return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./sortArray
Enter size  of the (int)array: 4
Enter the elements:
90 54 -1 3
-1 3 54 90
Enter size of the (float)array: 3
Enter the elements:
0.9 1.67 8.7
0.9 1.67 8.7
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```

Question 2)WAP to display data of two different types using function template with multiple arguments.

```
#include <iostream>
using namespace std;

template <class T, class U>
void display(T a, U b)
{
    cout << a << "\t" << b << endl;
}

int main()
{

    cout<<"\nDisplaying the first set \n";
    display(1.89, "Akriti");

    cout<<"\nDisplaying the second set \n";
    display('A', 108);

    return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./funcTemp

Displaying the first set
1.89    Akriti

Displaying the second set
A       108
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```

Question 3)Rewrite program 1 using class template

```
#include <iostream>

using namespace std;

template <class T>
class Arr
{
private:
   T *arr;
   int size;

public:
   Arr(int n)
   {
      size = n;
      arr = new T[size];
   }
   void getData()
   {
      for (int i = 0; i < size; i++)
         cin >> arr[i];
   }
   void sorting()
   {
      T temp;
      for (int i = 0; i < size; i++)
      {
         for (int j = 0; j < size - 1; j++)
         {
            if (arr[j] > arr[i])
            {
               temp = arr[i];
               arr[i] = arr[j];
```

```
                arr[j] = temp;
            }
        }
    }
    }
    void display()
    {
        for (int i = 0; i < size; i++)
            cout << arr[i] << " ";
        cout << "\n";
    }
};
int main()
{
    int n;
    cout << "Enter the size of the array: ";
    cin >> n;
    Arr<int> arr1(n);
    Arr<float> arr2(n);
    cout << "Enter elements of the integer array: \n";
    arr1.getData();

    cout << "Enter elements of the floating number array: \n";
    arr2.getData();

    //sorting
    arr1.sorting();
    arr2.sorting();

    cout << "\nResulting integer array:" << endl;
    arr1.display();

    cout << "\nResulting float number array:" << endl;
    arr2.display();
    return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./sortClassTemp
Enter the size of the array: 3
Enter elements of the integer array:
98 7 0
Enter elements of the floating number array:
9.8 0.1 1.5

Resulting integer array:
0 7 98

Resulting float number array:
0.1 1.5 9.8
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```

Question 4)Rewrite program 2 using class template

```
#include <iostream>
using namespace std;
template <class T1, class T2>
class data
{
public:
   T1 num1;
   T2 num2;
   data(T1 a, T2 b)
   {
      num1 = a;
      num2 = b;
   }
   void display()
   {
      cout << num1 << " \t" << num2;
   }
};
int main()
{
   data<double, string> ob1(1.89, "Akriti");
   data<char, int> ob2('A', 108);

   cout << "\nDisplaying the first set \n";
   ob1.display();

   cout << "\nDisplaying the second set \n";
   ob2.display();

   return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./dispClassTemp

Displaying the first set
1.89    Akriti
Displaying the second set
A       108
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```

Question 5) WAP to find reverseof given number using template based function.

```
#include <iostream>

using namespace std;

template <class T>
class data
{
private:
   T n;

public:
   data()
   {
      n = 0;
   }
   data(T x)
   {
      n = x;
   }
   T reve(T x)
   {
      T rem;
      T num = x;
      T revNum = 0;

      while (num != 0)
      {
         rem = num % 10;
         revNum = (revNum * 10) + rem;
         num = num / 10;
      }

      return revNum;
   }
};
int main()
{
   int x;
   cout << "Enter the (int)number to be reversed : \n";
   cin >> x;
   data<int> obj(x);
   cout << obj.reve(x);

   return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./reverse
Enter the (int)number to be reversed :
123456
654321
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```

Question 6) WAP to create a template to find the maximum value stored in an array.

```
#include <iostream>
using namespace std;

template <class T>

T max(T t[], int size)
{
   T temp = t[0];
   for (int i = 0; i < size; i++)
   {
      if (temp < t[i])
      {
         temp = t[i];
      }
   }
   return temp;
}

int main()
{
   int N;
   cout<<"Enter size of the array : \n";
   cin>>N;

   int Arr[N];
   cout << "Enter elements of the array : " << endl;

   for (int i = 0; i < N; i++)
   {
      cin >> Arr[i];
   }
   cout << "Maximum number in the array = " << max(Arr, N) << endl;
   return 0;
}
```

```
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021> ./maximum
Enter size of the array :
5
Enter elements of the array :
100 56 789 -1 5
Maximum number in the array = 789
PS D:\KIIT_NOTES\2nd year sem_3\OOP_lab\25_11_2021>
```