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Program-1

```cpp
#include <iostream>

using namespace std;

template <typename T> void SortArray(T *arr, int n=10){

    // Bubble Sorting
        for (int i=0; i<n; i++){
        for (int j=i; j<n; j++){
            if (arr[i]>arr[j]){
                T temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}


template <typename T> void Display(T *arr, int n=10){
    cout << "\n--- Displaying ---";
    for (int i=0; i<n; i++){
        cout << arr[i] << " ";
    }
}


int main()
{
        int arr1[] = {2,4,3,9,1,6,8,7,5,0};
        float arr2[] = {1.2, 8.4, 8.43, 8.39, 1.1};


    cout <<"----- Before Soring -----";
    Display(arr1);
    Display(arr2, 5);
```

```
    SortArray(arr1);

    SortArray(arr2, 5);

    cout <<"\n\n----- After Soring -----";

    Display(arr1);

    Display(arr2, 5);

        return 0;

}
```

```
----- Before Soring -----
--- Displaying ---2 4 3 9 1 6 8 7 5 0
--- Displaying ---1.2 8.4 8.43 8.39 1.1

----- After Soring -----
--- Displaying ---0 1 2 3 4 5 6 7 8 9
--- Displaying ---1.1 1.2 8.39 8.4 8.43
```

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Program-2

```cpp
#include <iostream>

#include <vector>

using namespace std;


template <typename T1, typename T2> void Display(T1 a, T2 b){

    cout << endl << a << " " << b;

}


int main (){

    int i = 8;

    float f = 13.56;

    char c = 'y';

    string s = "Hello";

    Display(i, s);

    Display(f, c);

}
```

```
8 Hello
13.56 y
```

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Program-3

```cpp
#include <iostream>

using namespace std;

// Class template

template <class T>

class MyClass {

  private:

    int size;

    T arr[];

  public:

    MyClass(int n, T a[]){

      size = n;

      for (int i=0; i<size; i++){

        arr[i] = a[i];

      }

    }

    void SortArray(){

      // Bubble Sorting

      for (int i=0; i<size-1; i++){

        for (int j=i; j<size; j++){

          if (arr[i]>arr[j]){

            T temp = arr[i];

            arr[i] = arr[j];

            arr[j] = temp;

          }

        }

      }

    }

    void Display(){

      cout <<endl;

      for (int i=0; i<size; i++){
```

```cpp
            cout << arr[i] << " ";

        }

    }

};


int main()

{

   int arr1[10] = {3,1,9,2,8,11,7,6,4,5};

        MyClass<int> obj1(10, arr1);

   float arr2[4] = {7.4, 7.2, 7.9, 7.6};

        MyClass<float> obj2(4, arr2);


   cout <<"----- Before Soring -----";

   obj1.Display();

   obj2.Display();

   obj1.SortArray();

   obj2.SortArray();

   cout <<"\n\n----- After Soring -----";

   obj1.Display();

   obj2.Display();

        return 0;

}
```

```
----- Before Soring -----
3 1 9 2 8 11 7 6 4 5
7.4 7.2 7.9 7.6

----- After Soring -----
1 2 3 4 5 6 7 8 9 11
7.2 7.4 7.6 7.9
```

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Program-4

```cpp
#include <iostream>

using namespace std;


void func(){

    float a, b;

    cout << "\nEnter value for a and b : ";

    cin >> a >> b;

    cout << a << "/" << b << " = ";


    try{

        // if condition used to get a custom output otherwise div by 0

        // gives inf because new C++ compiler already handles the exception

        if (b==0){

            cout << "[Exception occurred]";

            return;

        }

        cout << a/b ;

    }

    // unused code because new C++ compliers handle the exception by itself

    catch (exception e) {

        cout << "Exception occurred" << endl << e.what();

    }

}


int main(){

    func();

    func();

    func();

    return 0;

}
```

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Output

```
Enter value for a and b : 5 6
5/6 = 0.833333
Enter value for a and b : 5 0
5/0 = [Exception occurred]
Enter value for a and b : 0 8
0/8 = 0
```

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Program-5

```cpp
#include <iostream>

using namespace std;


int main() {
    int arr[4] = {1,3,5,2};


    for (int i=-2; i<8; i++){
        try{
            cout << arr[i] << " ";
        }
        catch (exception e){
            cout << "[Array out of bounds EXCEPTION]";
            e.what();
            break;
        }
    }
    cout << "\nC++ compiler by default handles exception";
    cout << "\nBy showing garbage values.";
}
```

Output

```
-516579981 -2 1 3 5 2 4 6422320 2445312 6422356
C++ compiler by default handles exception
By showing garbage values.
```