Creative Software Design, Assignment 11-1

Deadline: 2024-11-06 23:59 (No score for late submission)

- Submit your homework by uploading your zip file to the LMS assignment section. Below is an example.

```
13178_Assignment1-1_2024123456.zip
├─ 1.cc
├─ 2.cc
├─ 3.cc
└─ ...
```

- Your zip file name should follow this format:
  13178_Assignment[Assignment-number]_[Student-ID].zip
  - Ex. 13178_Assignment1-1_2024123456.zip
- Source files should be named as **<filename>.cc** *or* **<filename>.cpp**
- **You must submit your solution in the zip file before the deadline.**

1. **Write a C++ program to find the sum of an array using the sum function template.**

   A. **Example of the `main()` function:**

      1. **Define the sum function template.**

```
// Define the sum function template

int main() {
    float fdata[5];
    int i = 0;

    // Input 5 numbers
    cout << "\nInput 5 numbers >>" << endl;
    for (i = 0; i < 5; i++)
        cin >> fdata[i];

    // Print sum of 5 numbers
    cout << "\nSum of the above inputs is: " << sum(fdata, 5) << endl;

    return 0;
}
```

   B. Example output of your program (Bold text indicates user input):

```
Input 5 numbers >>
1⏎
3⏎
5.76⏎
2.567⏎
3.65⏎

Sum of the above inputs is: 15.977
```

   C. Submission file: one C++ source file (File name: 1.**cc** or 1.**cpp**)

2. Write a C++ program to reverse the order of values in an array using the reverseArray function template.

A. **Example of the `main()` function:**

1. **Define the reverseArray function template.**

```
// Define the reverseArray function template

int main() {
    int x[] = {1, 10, 100, 3, 5};
    reverseArray(x, 5);

    for (int i = 0; i < 5; i++)
        cout << x[i] << " ";

    return 0;
}c
```

B. Example output of your program (Bold text indicates user input):

```
5 3 100 10 1
```

C. Submission file: one C++ source file (File name: 2.**cc** or 2.**cpp**)

3. **Write a C++ program that uses a Calculator class template to perform addition, subtraction, multiplication, and division of two variables num1 and num2.**

A. **The `Calculator` class template is defined as follows:**

1. **Implement the `Result()`.**

```
template <class T>
class Calculator {
private:
    T num1, num2;

public:
    Calculator(T n1, T n2) {
        num1 = n1;
        num2 = n2;
    }

    // Method to display the results of addition, subtraction, multiplication, and division
    void Result() {
        // Implement the function to display results for each operation
    }
};
```

B. **Example of the `main()` function:**

```
int main() {
    int n1;
    float n2;

    cout << "Input 2 numbers. 1st an Integer, 2nd a Rational number"
         << endl;
    cin >> n1;
    cin >> n2;

    Calculator<double> doubleCalc(n1, n2);

    cout << endl << "Results:" << endl;
    doubleCalc.Result();

    return 0;
}
```

C. Example output of your program (Bold text indicates user input):

```
Input 2 numbers. 1st an Integer, 2nd a Rational number
42⏎
3.141592⏎

Results:
Numbers: 42 and 3.14159
42 + 3.14159 = 45.1416
42 - 3.14159 = 38.8584
42 * 3.14159 = 131.947
42 / 3.14159 = 13.369
```

D. Submission file: one C++ source file (File name: 3.**cc** or 3.**cpp**)