Computing Fundamentals &

Programming

***Section*: BSCE2021** **Assignment # 10** ***Total marks*: 100**

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Submission:

- *Email instructor or TA if there are any questions. You cannot look at others' solution or use others' solution, however, you can discuss it with each other. Plagiarism will lead to a straight zero with additional consequences as well.*
- *Submission after due time will not be accepted.*

TASKS:

1. Write code to print "I will be working hard to get a good grade in this course".

Code:

```
void task1() { //modification is done in "task7" function
    cout << "I will be working hard to get a good grade in this
course" << endl;
   return;
}
```

Output:

```
D:\Programming\GitHub\2021-fall-cfp-week11-assignment10-bsce21017\r.out
Which Task you want to check?
1
I will be working hard to get a good grade in this course
```

2. Declare 3 variables a,b,c. Take values of these variables from the user as input, and print these values.

Code:

```
void task2() {
   int a, b, c;
   cout << "Enter value for first variable: ";
   cin >> a;
   cout << "Enter value for second variable: ";
   cin >> b;
   cout << "Enter value for third variable: ";
   cin >> c;
   cout << "First variable: " << a << endl << "Second variable: " << b <<
   endl << "Third variable: " << c << endl;
   return;
```

}

Output:

```
D:\Programming\GitHub\2021-fall-cfp-week11-assignment10-bsce2101?\r.out
Which Task you want to check?
2
Enter value for first variable: 2
Enter value for second variable: 3
Enter value for third variable: 5
First variable: 2
Second variable: 3
Third variable: 5
```

3. Write a function 'addition' that takes previously declared variables as parameters and return their sum.

Code:

```
int addition(int first , int second ) { //int type function takes two
   parameter of int type,default values = 0
   int sum = first + second; //adds "first" and "second" variables and
   saves the result in "sum" variable
   return sum; //return the value of sum to the function
}
```

Output:

```
Which Task you want to check?
3
Enter First Number: 31
Enter Second Number: 43
Sum is: 74
```

4. Comment on each line of the function in task 3.

```
int addition(int first , int second ) {
//int type function takes two parameter
of int type
     int sum = first + second; //adds
"first" and "second" variables and saves
the result in "sum" variable
    return sum; //return the value of sum
to the function
}
```

Output:

```
Which Task you want to check?
4
refer Function 'addition' in Functions.cpp to see comments written against it.
```

5. Modify your code of task 3, such that it takes default value ‘0’ as parameter values if any of the argument value is not specified.

Code:

```
int addition(int first = 0 , int second = 0) { //int type function takes
   two parameter of int type,default values = 0
   int sum = first + second; //adds "first" and "second" variables and
   saves the result in "sum" variable
   return sum; //return the value of sum to the function
}
```

Output:

```
Which Task you want to check?
5
Default values will be considered.
Result: 0
```

6. Modify your code of task 3, so that same function can be used for any data type. (Hint: Template function).

Code:

```
template<typename T>
//task 6 (modification of Task 3 as asked)
T mAddition(T first = 0, T second = 0) { //T type function takes two
   parameter of T type,default values = 0
   T sum = first + second; //adds "first" and "second" variables and
   saves the result in "sum" variable
   return sum; //return the value of sum to the function
}

template<typename T1>
// to take input from user of any data type
void input(T1 &a, T1 &b) {
   cout << "Enter first input: ";
   cin >> a;
   cout << "Enter second input: ";
   cin >> b;
}

void helperTask6() {  //calls the function "addition" with different data
   types
   int type_choose, first_int, second_int, sum;
   double first_double, second_double, result;
   float first_float, second_float, float_result;
   string first_str, second_str, str_result;
   again:
   cout << "Press 1 for 'int'" << endl;
   cout << "Press 2 for 'double'" << endl;
   cout << "Press 3 for 'float'" << endl;
```

```
    cout << "Press 4 for 'string'" << endl;
    cout << "Choose by which 'data type' you want to proceed: ";
    cin >> type_choose;
    if (type_choose >= 0 && type_choose < 5) {
        switch (type_choose) {
            case 1:
                input<int>(first_int, second_int);
                sum = mAddition<int>(first_int, second_int);
                cout << "Result is " << sum << endl;
                break;
            case 2:
                input<double>(first_double, second_double);
                result = mAddition<double>(first_double, second_double);
                cout << "Result is " << result << endl;
                break;
            case 3:
                input<float>(first_float, second_float);
                float_result = mAddition<float>(first_float,
    second_float);
                cout << "Result is " << float_result << endl;
                break;
            case 4:
                input<string>(first_str, second_str);
                str_result = mAddition<string>(first_str, second_str);
                cout << "Result is " << str_result << endl;
                break;
        }
    }else {
        cout << "Invalid Selection, Try again" << endl;
        Beep(300, 800); // 1000 hertz for 1 second
        goto again;
    }
    return;
}
```

Output:

```
Which Task you want to check?
6
Press 1 for 'int'
Press 2 for 'double'
Press 3 for 'float'
Press 4 for 'string'
Choose by which 'data type' you want to proceed: 3
Enter first input: 4.67
Enter second input: 3.95
Result is 8.62
```

7. Modify your code of task 1 and print “I will be working hard to get a good grade in this course” 1000 times.

Code:

```
void task7() { //modification in task 1 to print given string 1000 times.
   for (int i = 0; i < 1000; ++i) { //will iterate for 1000 times
   starting from i = 0 to 999
       cout << "I will be working hard to get a good grade in this
   course" << endl;
   }
   return; //ends the function
}
```

Output:

```
Which Task you want to check?
7
I will be working hard to get a good grade in this course
I will be working hard to get a good grade in this course
I will be working hard to get a good grade in this course
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I will be working hard to get a good grade in this course
I will be working hard to get a good grade in this course
```

continued till 1000th times…..

8. Write a program using a loop that prompts a user to enter 5 integer values.

Code:

```
void task8() {  //prompts the user to enter 5 integer values
   int user;
   for (int i = 0; i < REP; ++i) { //repeats till i = (REP[const
int] = 5)
       again:
       cout << "Enter only integer input: ";
       cin >> user; //takes input from user
       if (cin.fail()) { //determines that user entered valid
input with regard to data type
           Beep(530, 700); // 530 hertz for 700 milliseconds
           cout << "Invalid Input, Try again" << endl;
           cin.clear(); //will clear the error flag on cin
           cin.ignore(256, '\n'); //will ignore any string if
given in cin
           goto again; //directs the program to "again" label
       }
   }
   cout << "Task Accomplished. Five integer values have been
taken from you." << endl;
}
```

Output:

```
Which Task you want to check?
8
Enter only integer input: 6
Enter only integer input: y
Invalid Input, Try again
Enter only integer input: 7
Enter only integer input: 8
Enter only integer input: 8
Enter only integer input: 7
Task Accomplished. Five integer values have been taken from you.
```

9. Modify your code of task 8 and store input values in an array.

Code:

```
void task9() {  //modification in task8 to prompts the user to enter 5
integer values and save it in array
   int user[REP];
   for (int i = 0; i < REP; ++i) { //repeats till i = (REP[const int] = 5)
       again:
       cout << "Enter only integer input: ";
       cin >> user[i]; //takes input from user
       if (cin.fail()) { //determines that user entered valid input with
regard to datatype
```

```
            Beep(530, 700); // 530 hertz for 700 milliseconds
            cout << "Invalid Input, Try again" << endl;
            cin.clear(); //will clear the error flag on cin
            cin.ignore(256, '\n'); //will ignore any string if given in
cin
            goto again; //directs the program to "again" label
        }
    }
    cout << "Task Accomplished. Five integer values have been taken from
you and stored in an array." << endl;
}
```

Output:

```
Which Task you want to check?
9
Enter only integer input: 2
Enter only integer input: 3
Enter only integer input: 4
Enter only integer input: 5
Enter only integer input: k
Invalid Input, Try again
Enter only integer input: 6
Task Accomplished. Five integer values have been taken from you and stored in an array.
```

10. You are given the following data:

11	12	13
21	22	23
31	32	33

How will you store this data? Write code to store it and print on console.

Code:

```
void task10() {
    int arr[ROWS][COLS], start = 0;
    for (int i = 0; i < ROWS; ++i) {
        start += 10;
        int increment = start;
        for (int j = 0; j < COLS; ++j) {
            increment++;
            arr[i][j] = increment;
        }
    }
    cout << "Output: " << endl;
    for (int i = 0; i < ROWS; ++i) {
        for (int j = 0; j < COLS; ++j) {
            cout << arr[i][j] << " ";
```

```
        }
        cout << endl;
    }
}
```

Output:

```
Which Task you want to check?
10
Output:
11 12 13
21 22 23
31 32 33
```

—----------THE END----------