

Practice 4

1. Refer to the code below :

```
1 #include <iostream>
2 #include <string>
3 using namespace std;
4
5 template<typename T>
6 T maxValue(T value1, T value2)
7 {
8     if (value1 > value2)
9         return value1;
10    else
11        return value2;
12 }
13
14 int main()
15 {
16     cout << "Maximum between 1 and 3 is " << maxValue(1,
17 ) << endl;
18     cout << "Maximum between 1.5 and 0.3 is "
19         << maxValue(1.5, 0.3) << endl;
20     cout << "Maximum between 'A' and 'N' is "
21         << maxValue('A', 'N') << endl;
22     cout << "Maximum between \"ABC\" and \"ABD\" is "
23         << maxValue("ABC", "ABD") << endl;
24     return 0;
25 }
```

- i) In the above program, can you invoke the `maxValue()` function with two arguments of different types, such as `maxValue(1, 1.5)`?
- ii) For the `maxValue()` function, can you invoke it with two arguments of strings, such as `maxValue("ABC", "ABD")`? Can you invoke it with two arguments of circles, such as `maxValue(Circle(2), Circle(3))`?
- iii) Can `template<typename T>` be replaced by `template<class T>`?

2. What is wrong in the following code?

```
1  #include <iostream>
2  #include <string>
3  using namespace std;
4
5  template<typename T>
6  T maxValue(T value1, T value2)
7  {
8      int result;
9      if (value1 > value2)
10         result = value1;
11     else
12         result = value2;
13     return result;
14 }
15
16 int main()
17 {
18     cout << "Maximum between 1 and 3 is "
19         << maxValue(1, 3) << endl;
20     cout << "Maximum between 1.5 and 0.3 is "
21         << maxValue(1.5, 0.3) << endl;
22     cout << "Maximum between 'A' and 'N' is "
23         << maxValue('A', 'N') << endl;
24     cout << "Maximum betwrrn \"ABC\" and \"ABD\" is "
25         << maxValue("ABC", "ABD") << endl;
26
27     return 0;
28 }
```

3. If you define the maxValue function as follows:

```
Template<typename T1, typenaem T2>
T1 maxValue(T1 value1, T2 value2)
{
    if (value1 > value2)
        return value1;
    else
        return value2;
}
```

what would be the return value from invoking `maxValue(1, 2.5)`, `maxValue(1.4, 2.5)`, and `maxValue(1.5, 2)`?

4. Start with a string
" Only two things are infinite, the universe and human stupidity,
and I'm not sure about the former."
which is a quotation by Einstein.

Write a program, making use of some member functions of the string class, its array indexing, etc to count the number of occurrences of the letter 'a' and 'A'.

Once this is working, turn the process of counting character 'a' or 'A' into a function which can return a count on any character specified. Call this function `countChar`. This should have the prototype:

```
int countChar(string, char);
```

where the first parameter is of string type and char is the particular character you want to count in the string. **countChar** will return the number of such characters detected.
This function will be used in the second part below.

5. A string objects shares many characteristics with the C-string you have learnt about in your first programming module. For example, each character in the string can be accessed using the "[]" operator. For a string

```
string S = "ABCDEF";
```

`S[0]` is the value 'A', `S[1]` the value 'B', etc.

If we change the value of `S[0]`, `S[1]`, then the resultant S will be changed.

Use this idea of assembling individual characters to form a string which is the reverse of the original.

6. String objects are supported by many member functions.

There is one function `substr` that extracts a substring from a string object. Look up www.cplusplus.com to learn how this function may be used. Then use it with the appropriate parameters to extract suitable segments of the original string, and join them together to form the reverse of the original string.

7. Simple string class practice

"Quantitative Easing(QE2) has multi deffects on world economy. For one thing, the ensuing weaking of the US dollar will mean a continual low inter rat, forcing dollar holders to seek better forential returns by doing carry trade in stock exchanges around the word, increasing wide girations in stock and assets prices. While QE2 aims to lift the US freakonomics to a level of sustained growth and increased deportment, its effects on the rest of the world are much less underroot and the US had clearly not been brothered by it."

There are several spelling errors in the above string, which is part of a longer text document. They are results of systematic problems that causes repeated spelling errors, such as "ensuing weaking" instead of "ensuing weakening", or "freakonomics" instead of "economics". Assign this string to a string variable, and write a program, comprising functions calls using find() and replace() to correct all the errors. You may want to first store the erroneous words and actual replacement words in separate arrays and to facilitate your program actions.

The actual words and facts are:

- i. "multiple effects" , not "multi defects"
- ii. "ensuing weakening", not "ensuing weaking"
- iii. "interest rate", not "inter rat"
- iv. better financial returns
- v. around the world
- vi. increasing wild gyrations
- vii. US economics
- viii. Sustained growth and increase employment
- ix. less understood
- x. been bothered by it