International University of Business Agriculture and Technology

Lab Report 8

Course Code: CSC 284

Course Name: Programming in C++ Lab

Submitted To:

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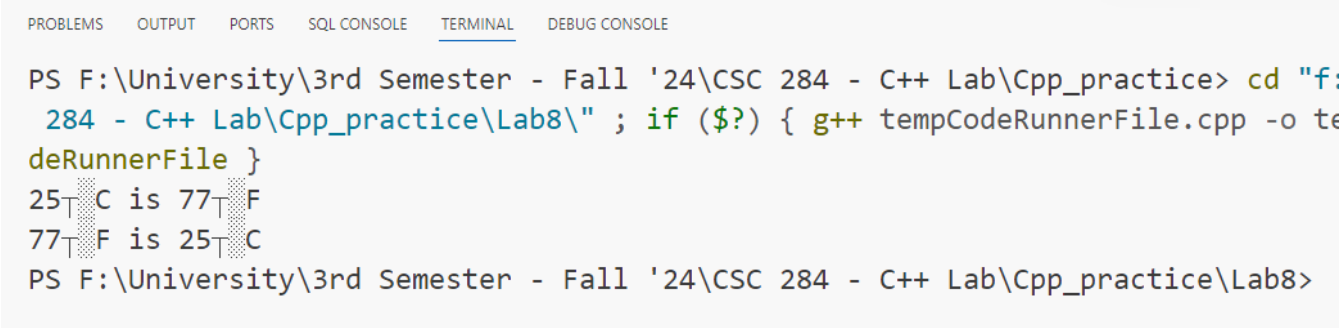
Section: C

1.Code:

```cpp
#include <iostream>
using namespace std;
double convertTemperature(double celsius)
{
    return (celsius * 9.0 / 5.0) + 32;
}
double convertTemperature(double fahrenheit, char)
{
    return (fahrenheit - 32) * 5.0 / 9.0;
}
int main()
{
    double tempC = 25.0;
    double tempF = 77.0;

    cout << tempC << "°C is " << convertTemperature(tempC) << "°F" << endl;
    cout << tempF << "°F is " << convertTemperature(tempF, 'F') << "°C" <<
endl;
    return 0;
}
```

Output:



2.Code:

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

const double PI = 3.14159;

double calculateArea(double radius)
{
    return PI * radius * radius;
}

double calculateArea(double length, double width)
{
    return length * width;
}

double calculateArea(double base, double height, char)
{
    return 0.5 * base * height;
}

int main()
{
    double radius = 5.0;
    double length = 10.0, width = 4.0;
    double base = 8.0, height = 6.0;

    cout << "Area of the circle: " << calculateArea(radius) << endl;
    cout << "Area of the rectangle: " << calculateArea(length, width) <<
endl;
    cout << "Area of the triangle: " << calculateArea(base, height, 'T') <<
endl;

    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univ
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCod
deRunnerFile }
Area of the circle: 78.5397
Area of the rectangle: 40
Area of the triangle: 24
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

3.Code:

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

const double PI = 3.14159;

double calculateVolume(double side)
{
    return side * side * side;
}

double calculateVolume(double radius, double height)
{
    return PI * radius * radius * height;
}

double calculateVolume(double length, double width, double height)
{
    return length * width * height;
}

int main()
{
    double side = 3.0;
    double radius = 2.0, cylinderHeight = 5.0;
    double length = 4.0, width = 3.0, boxHeight = 6.0;

    cout << "Volume of the cube: " << calculateVolume(side) << endl;
    cout << "Volume of the cylinder: " << calculateVolume(radius,
cylinderHeight) << endl;
    cout << "Volume of the rectangular box: " << calculateVolume(length,
width, boxHeight) << endl;

    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univ
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCod
deRunnerFile }
Volume of the cube: 27
Volume of the cylinder: 62.8318
Volume of the rectangular box: 72
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

4.Code:

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

int processString(const string &str)
{
    return str.length();
}

int processString(const string &str, char ch)
{
    int count = 0;
    for (char c : str)
    {
        if (c == ch)
            count++;
    }
    return count;
}

int main()
{
    string text = "hello world";
    char targetChar = 'l';

    cout << "Length of the string: " << processString(text) << endl;
    cout << "Count of '" << targetChar << "' in the string: " <<
processString(text, targetChar) << endl;

    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univers
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ 4.cpp -o 4 } ; if ($?) { .\4 }
Length of the string: 11
Count of 'l' in the string: 3
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

5.Code:

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

int processString(const string &str)
{
    return str.length();
}

int processString(const string &str, char ch)
{
    int count = 0;
    for (char c : str)
    {
        if (c == ch)
            count++;
    }
    return count;
}

int main()
{
    string text = "hello world";
    char targetChar = 'l';

    cout << "Length of the string: " << processString(text) << endl;
    cout << "Count of '" << targetChar << "' in the string: " <<
processString(text, targetChar) << endl;

    return 0;
}
```

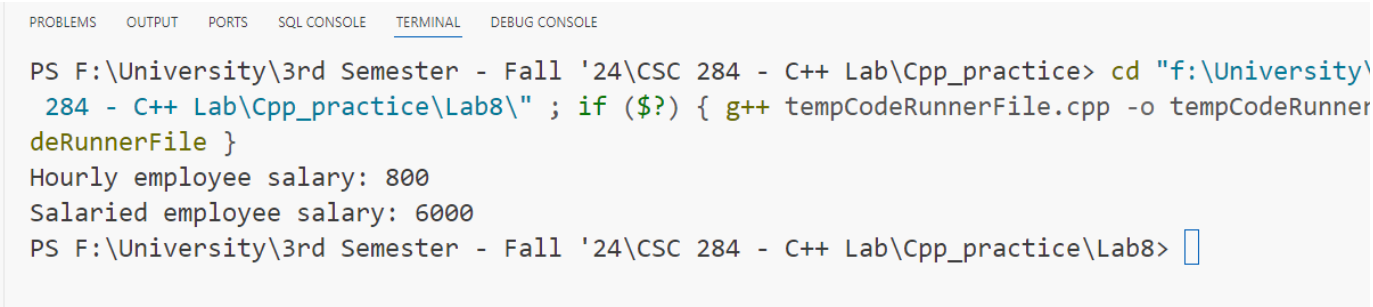
Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Un
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempC
deRunnerFile }
Length of the string: 11
Count of 'l' in the string: 3
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

6.Code:

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

double calculateSalary(double hourlyWage, double hoursWorked, char)
{
    return hourlyWage * hoursWorked;
}

double calculateSalary(double baseSalary, double performanceBonus)
{
    return baseSalary + performanceBonus;
}

int main()
{
    cout << "Hourly employee salary: " << calculateSalary(20.0, 40, 'H') <<
endl;
    cout << "Salaried employee salary: " << calculateSalary(5000.0, 1000.0)
<< endl;
    return 0;
}
```

Output:



7.Code:

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

double convertCurrency(double dollars, char toCurrency)
{
    if (toCurrency == 'E')
        return dollars * 0.85; // Dollars to Euros
    if (toCurrency == 'P')
        return dollars * 0.75; // Dollars to Pounds
    return dollars;            // Default no conversion
}

double convertCurrency(double euros)
{
    return euros * 1.18; // Euros to Dollars
}

int main()
{
    cout << "Dollars to Euros: " << convertCurrency(100.0, 'E') << endl;
    cout << "Euros to Dollars: " << convertCurrency(85.0) << endl;
    cout << "Dollars to Pounds: " << convertCurrency(100.0, 'P') << endl;
    return 0;
}
```

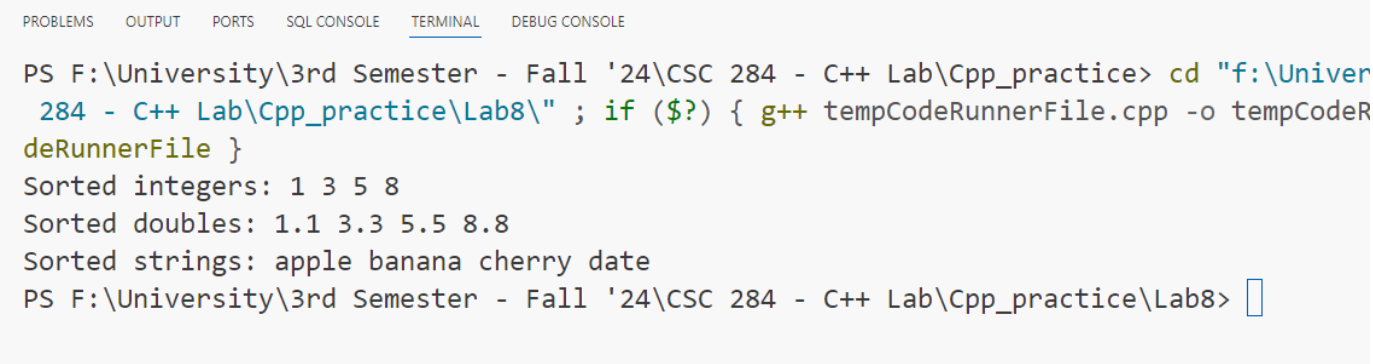
Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univers
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRu
deRunnerFile }
Dollars to Euros: 85
Euros to Dollars: 100.3
Dollars to Pounds: 75
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

8.Code:

```cpp
#include <iostream>
#include <algorithm>
#include <vector>
using namespace std;

void sort(vector<int> &arr)
{
    sort(arr.begin(), arr.end());
}

void sort(vector<double> &arr)
{
    sort(arr.begin(), arr.end());
}

void sort(vector<string> &arr)
{
    sort(arr.begin(), arr.end());
}

int main()
{
    vector<int> intArr = {5, 3, 8, 1};
    vector<double> floatArr = {5.5, 3.3, 8.8, 1.1};
    vector<string> strArr = {"banana", "apple", "cherry", "date"};

    sort(intArr);
    sort(floatArr);
    sort(strArr);

    cout << "Sorted integers: ";
    for (int x : intArr)
        cout << x << " ";
    cout << "\nSorted doubles: ";
    for (double x : floatArr)
        cout << x << " ";
    cout << "\nSorted strings: ";
    for (string x : strArr)
        cout << x << " ";
    return 0;
}
```

Output:


PROBLEMS
OUTPUT
PORTS
SQL CONSOLE
TERMINAL
DEBUG CONSOLE
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univer
284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeR
deRunnerFile }
Sorted integers: 1 3 5 8
Sorted doubles: 1.1 3.3 5.5 8.8
Sorted strings: apple banana cherry date
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>

9.Code:

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

string formatDate(int day, int month, int year)
{
    ostringstream oss;
    if (day < 10)
        oss << "0";
    oss << day << "/";
    if (month < 10)
        oss << "0";
    oss << month << "/";
    oss << year;
    return oss.str();
}

string formatDate(const string &date)
{
    return date.substr(8, 2) + "/" + date.substr(5, 2) + "/" + date.substr(0,
4);
}

int main()
{
    cout << "Formatted date (integers): " << formatDate(7, 1, 2025) << endl;
    cout << "Formatted date (string): " << formatDate("2025-01-07") << endl;
    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Universit
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunn
deRunnerFile }
Formatted date (integers): 07/01/2025
Formatted date (string): 07/01/2025
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```

10.Code:

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

double applyDiscount(double price, double percentage)
{
    return price - (price * percentage / 100);
}

double applyDiscount(double price, int flatDiscount)
{
    return price - flatDiscount;
}

double applyDiscount(double price1, double price2, double price3, double
percentage)
{
    return (price1 - (price1 * percentage / 100)) +
           (price2 - (price2 * percentage / 100)) +
           (price3 - (price3 * percentage / 100));
}

int main()
{
    double price1 = 100.0, price2 = 200.0, price3 = 300.0;

    cout << "Price after percentage discount: " << applyDiscount(500.0, 10.0)
<< endl;
    cout << "Price after flat discount: " << applyDiscount(500.0, 50) <<
endl;
    cout << "Total price after percentage discount: " <<
applyDiscount(price1, price2, price3, 10.0) << endl;

    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  TERMINAL  DEBUG CONSOLE

PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice> cd "f:\Univ
 284 - C++ Lab\Cpp_practice\Lab8\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCod
deRunnerFile }
Price after percentage discount: 450
Price after flat discount: 450
Total price after percentage discount: 540
PS F:\University\3rd Semester - Fall '24\CSC 284 - C++ Lab\Cpp_practice\Lab8>
```