Computer Architecture

[Year 01 - Semester 02]

Module Code	: CS104.3
Module Lecturer	: Dr. Chandana Perera
Index No	: 21038
Student Name	: K. Y. B. H. S. Weerasinghe
Degree Program	: BSc in Management Information System
Batch	: 20.2
Assignment	: Final Assignment (Individual)

Acknowledgement

I had to take the support and encouragement of some esteemed individuals, who deserve my deepest gratitude, in preparing for my mission. As I was very happy with the completion of this task, I would like to express my appreciation to Dr. Chandana Perera and Mr. Gayan Perera, at NSBM Green University for providing me with good assignment guidelines during various consultations. I would also like to extend my appreciation to all those who led me directly and indirectly in writing this mission.

Introduction

At the beginning of this report we will introduce the program and how the code is written. Then there is a brief description of each code of along with the source of the reference code. The following pages show the source code, program output and screenshots of the saved files. At the end we have gained and the challenges we have faced.

Processes in which the code should be written

We have been instructed to develop four C/C++ programs to perform the following functions.

1. *Calculate the square value of a number given by the user. Then print the given number, the square value of the number and the system time when the code is activated.*

2. *Use the above function 20 times for a while or loop while printing the calculation before the given number.*

3. *Write the above information to a text file with the extension.*

4. *Read the previously written text file from the hard disk and display the calculated number, square value, and system time at the time of writing, and display it again with the current system time, which is the read time.*

In addition, we were instructed to display the following information on the screen along with the output.

- Student number
- Student Name
- The MAC address of the computer
- The name of the computer

This information should be included in the code, program outputs, and all text files. Our focus is on developing these programs using a minimal number of lines and therefore the objective language C ++ was used. C is also the language to represent. Specially I have built my functionality for a Linux OS here.

Different Technology and Codes Use to Develop the Program

MAC address

- **cout << “Mac Address” << end -** C++

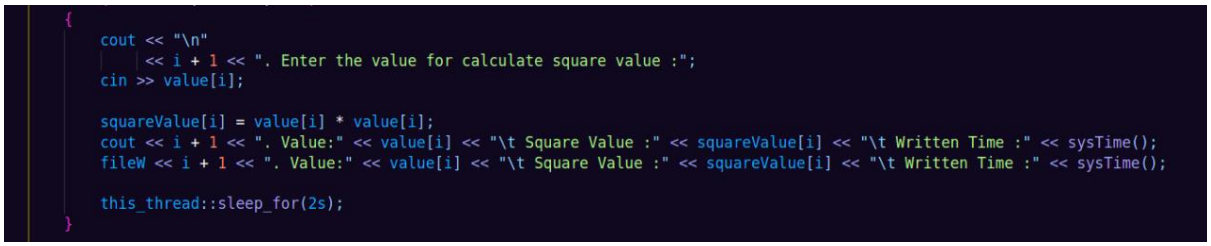
```
cout << "Mac Address" << endl;
system("cat /sys/class/net/wlp2s0/address");
```

Source Code

I only used C++ to do all the task here.

01. Program

Calculate the square value of a number given by the user. Then print the given number, the square value of the number and the system time when the code is activated.



```
{
    cout << "\n"
         << i + 1 << ". Enter the value for calculate square value :";
    cin >> value[i];

    squareValue[i] = value[i] * value[i];
    cout << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();
    fileW << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();

    this_thread::sleep_for(2s);
}
```

02. Program

Use the above function 20 times for a while or loop while printing the calculation before the given number.

```
#include <iostream>
#include <unistd.h>
#include <limits.h>
#include <thread>
#include <ctime>
#include <chrono>
#include <fstream>

using namespace std;

std::string sysTime()
{
    auto nowTim = chrono::system_clock::now();
    time_t slpTime = chrono::system_clock::to_time_t(nowTim);
    return ctime(&slpTime);
}

int main()
{

    char hostname[HOST_NAME_MAX];

    string line;
    int value[20], squareValue[20];
```

03. Program

Write the above information to a text file with the extension.

```
fstream fileW;
fileW.open("lg.txt", ios::in | ios::out | ios::app);
```

```
squareValue[i] = value[i] * value[i];
cout << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();
fileW << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();
```

```
while (getline(fileW, line))
```

04. Program

Read the previously written text file from the hard disk and display the calculated number, square value, and system time at the time of writing, and display it again with the current system time, which is the read time.

```cpp
#include <iostream>
#include <unistd.h>
#include <limits.h>
#include <thread>
#include <ctime>
#include <chrono>
#include <fstream>

using namespace std;

std::string sysTime()
{
    auto nowTim = chrono::system_clock::now();
    time_t slpTime = chrono::system_clock::to_time_t(nowTim);
    return ctime(&slpTime);
}

int main()
{

    char hostname[HOST_NAME_MAX];

    string line;
    int value[20], squareValue[20];

    fstream fileW;
    fileW.open("lg.txt", ios::in | ios::out | ios::app);

    gethostname(hostname, HOST_NAME_MAX);

    cout << "Mac Address" << endl;
    system("cat /sys/class/net/wlp2s0/address");

    cout << "\nComputer Name " << endl;
    cout << hostname << endl;

    cout << "\nStudent Name" << endl;
    cout << "Shenaya Weerasinghe" << endl;
```

```cpp
    cout << "\nStudent id" << endl;
    cout << "21038" << endl;
    for (int i = 0; i < 20; i++)
    {
        cout << "\n"
             << i + 1 << ". Enter the value for calculate square value :";
        cin >> value[i];

        squareValue[i] = value[i] * value[i];
        cout << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();
        fileW << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();

        this_thread::sleep_for(2s);
    }

    cout << "\n\n";
    fileW.seekg(0);

    while (getline(fileW, line))
    {
        cout << line << "\t Reading Time :" << sysTime() << endl;
        this_thread::sleep_for(2s);
    }
```

05. Computer Information

- Student number
- Student Name
- The MAC address of the computer
- The name of the computer

```cpp
#include <iostream>
#include <unistd.h>
#include <limits.h>
#include <thread>
#include <ctime>
#include <chrono>
#include <fstream>

using namespace std;

std::string sysTime()
{
    auto nowTim = chrono::system_clock::now();
    time_t slpTime = chrono::system_clock::to_time_t(nowTim);
    return ctime(&slpTime);
}

int main()
{

    char hostname[HOST_NAME_MAX];

    string line;
    int value[20], squareValue[20];

    fstream fileW;
    fileW.open("lg.txt", ios::in | ios::out | ios::app);

    gethostname(hostname, HOST_NAME_MAX);

    cout << "Mac Address" << endl;
    system("cat /sys/class/net/wlp2s0/address");

    cout << "\nComputer Name " << endl;
    cout << hostname << endl;

    cout << "\nStudent Name" << endl;
    cout << "Shenaya Weerasinghe" << endl;
```

```cpp
    cout << "\nStudent id" << endl;
    cout << "21038" << endl;
    for (int i = 0; i < 20; i++)
    {
        cout << "\n"
             << i + 1 << ". Enter the value for calculate square value :";
        cin >> value[i];

        squareValue[i] = value[i] * value[i];
        cout << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();
        fileW << i + 1 << ". Value:" << value[i] << "\t Square Value :" << squareValue[i] << "\t Written Time :" << sysTime();

        this_thread::sleep_for(2s);
    }

    cout << "\n\n";
    fileW.seekg(0);

    while (getline(fileW, line))
    {
        cout << line << "\t Reading Time :" << sysTime() << endl;
        this_thread::sleep_for(2s);
    }
```

Output of each Program on the screen

01. Program

Calculate the square value of a number given by the user. Then print the given number, the square value of the number and the system time when the code is activated.

```
1. Enter the value for calculate square value :74
1. Value:74      Square Value :5476      Written Time :Fri Jun 18 15:17:37 2021

2. Enter the value for calculate square value :58
2. Value:58      Square Value :3364      Written Time :Fri Jun 18 15:17:40 2021
```

02. Program

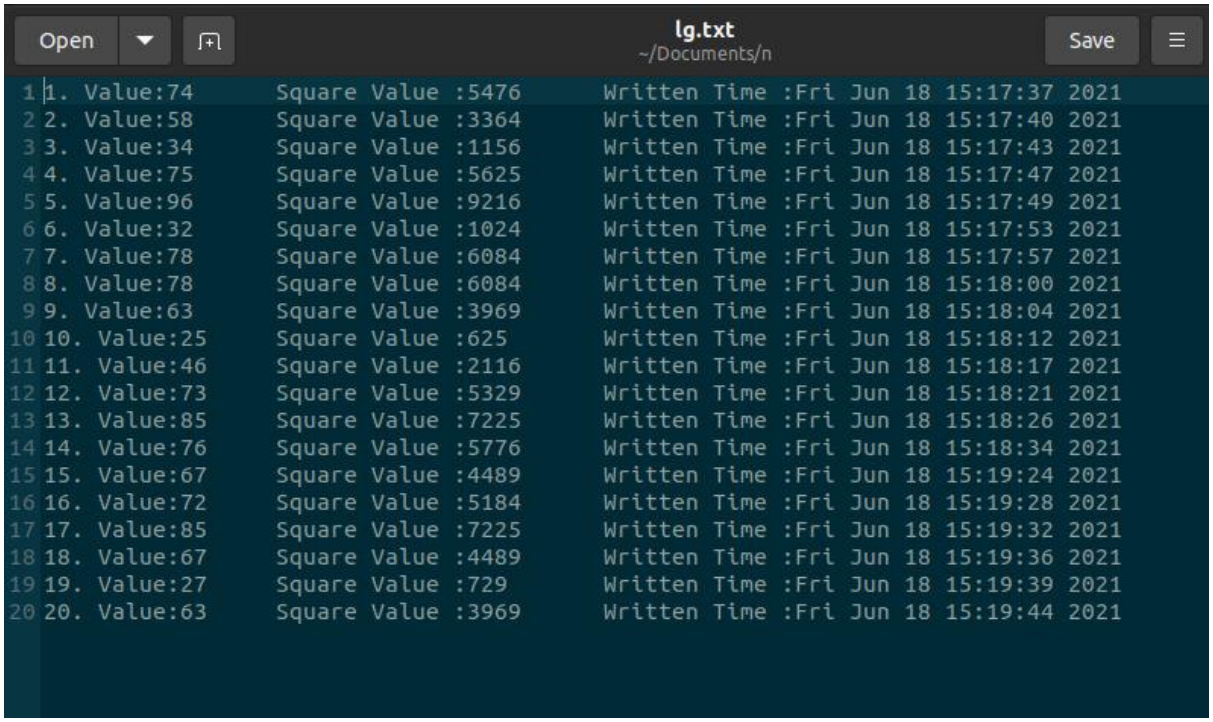
Use the above function 20 times for a while or loop while printing the calculation before the given number.

```
1. Value:74      Square Value :5476      Written Time :Fri Jun 18 15:17:37 2021  Reading Time :Fri Jun 18 15:19:46 2021
2. Value:58      Square Value :3364      Written Time :Fri Jun 18 15:17:40 2021  Reading Time :Fri Jun 18 15:19:48 2021
3. Value:34      Square Value :1156      Written Time :Fri Jun 18 15:17:43 2021  Reading Time :Fri Jun 18 15:19:50 2021
4. Value:75      Square Value :5625      Written Time :Fri Jun 18 15:17:47 2021  Reading Time :Fri Jun 18 15:19:52 2021
5. Value:96      Square Value :9216      Written Time :Fri Jun 18 15:17:49 2021  Reading Time :Fri Jun 18 15:19:54 2021
6. Value:32      Square Value :1024      Written Time :Fri Jun 18 15:17:53 2021  Reading Time :Fri Jun 18 15:19:56 2021
7. Value:78      Square Value :6084      Written Time :Fri Jun 18 15:17:57 2021  Reading Time :Fri Jun 18 15:19:58 2021
8. Value:78      Square Value :6084      Written Time :Fri Jun 18 15:18:00 2021  Reading Time :Fri Jun 18 15:20:00 2021
9. Value:63      Square Value :3969      Written Time :Fri Jun 18 15:18:04 2021  Reading Time :Fri Jun 18 15:20:02 2021
10. Value:25     Square Value :625       Written Time :Fri Jun 18 15:18:12 2021  Reading Time :Fri Jun 18 15:20:04 2021
11. Value:46     Square Value :2116      Written Time :Fri Jun 18 15:18:17 2021  Reading Time :Fri Jun 18 15:20:06 2021
12. Value:73     Square Value :5329      Written Time :Fri Jun 18 15:18:21 2021  Reading Time :Fri Jun 18 15:20:08 2021
13. Value:85     Square Value :7225      Written Time :Fri Jun 18 15:18:26 2021  Reading Time :Fri Jun 18 15:20:10 2021
14. Value:76     Square Value :5776      Written Time :Fri Jun 18 15:18:34 2021  Reading Time :Fri Jun 18 15:20:12 2021
15. Value:67     Square Value :4489      Written Time :Fri Jun 18 15:19:24 2021  Reading Time :Fri Jun 18 15:20:14 2021
16. Value:72     Square Value :5184      Written Time :Fri Jun 18 15:19:28 2021  Reading Time :Fri Jun 18 15:20:16 2021
17. Value:85     Square Value :7225      Written Time :Fri Jun 18 15:19:32 2021  Reading Time :Fri Jun 18 15:20:18 2021
18. Value:67     Square Value :4489      Written Time :Fri Jun 18 15:19:36 2021  Reading Time :Fri Jun 18 15:20:20 2021
19. Value:27     Square Value :729       Written Time :Fri Jun 18 15:19:39 2021  Reading Time :Fri Jun 18 15:20:22 2021
20. Value:63     Square Value :3969      Written Time :Fri Jun 18 15:19:44 2021  Reading Time :Fri Jun 18 15:20:24 2021
```

03. Program

Write the above information to a text file with the extension.


ca.out
CAAssignmen
t6.cpp
lg.txt


Open
lg.txt
~/Documents/n
Save
1. Value:74 Square Value :5476 Written Time :Fri Jun 18 15:17:37 2021
2. Value:58 Square Value :3364 Written Time :Fri Jun 18 15:17:40 2021
3. Value:34 Square Value :1156 Written Time :Fri Jun 18 15:17:43 2021
4. Value:75 Square Value :5625 Written Time :Fri Jun 18 15:17:47 2021
5. Value:96 Square Value :9216 Written Time :Fri Jun 18 15:17:49 2021
6. Value:32 Square Value :1024 Written Time :Fri Jun 18 15:17:53 2021
7. Value:78 Square Value :6084 Written Time :Fri Jun 18 15:17:57 2021
8. Value:78 Square Value :6084 Written Time :Fri Jun 18 15:18:00 2021
9. Value:63 Square Value :3969 Written Time :Fri Jun 18 15:18:04 2021
10. Value:25 Square Value :625 Written Time :Fri Jun 18 15:18:12 2021
11. Value:46 Square Value :2116 Written Time :Fri Jun 18 15:18:17 2021
12. Value:73 Square Value :5329 Written Time :Fri Jun 18 15:18:21 2021
13. Value:85 Square Value :7225 Written Time :Fri Jun 18 15:18:26 2021
14. Value:76 Square Value :5776 Written Time :Fri Jun 18 15:18:34 2021
15. Value:67 Square Value :4489 Written Time :Fri Jun 18 15:19:24 2021
16. Value:72 Square Value :5184 Written Time :Fri Jun 18 15:19:28 2021
17. Value:85 Square Value :7225 Written Time :Fri Jun 18 15:19:32 2021
18. Value:67 Square Value :4489 Written Time :Fri Jun 18 15:19:36 2021
19. Value:27 Square Value :729 Written Time :Fri Jun 18 15:19:39 2021
20. Value:63 Square Value :3969 Written Time :Fri Jun 18 15:19:44 2021

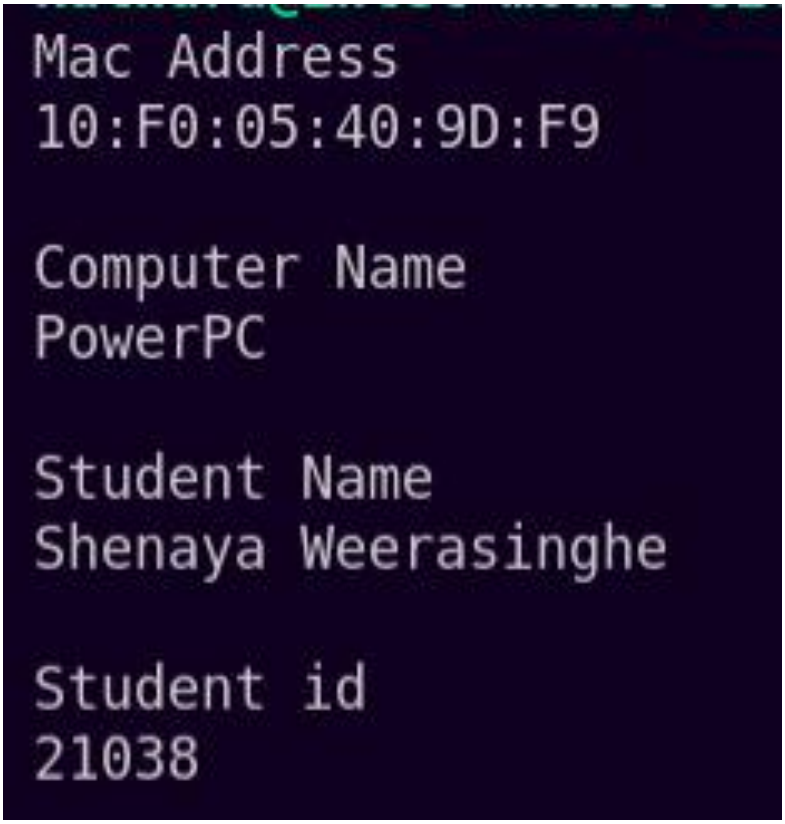
04. Program

Read the previously written text file from the hard disk and display the calculated number, square value, and system time at the time of writing, and display it again with the current system time, which is the read time.

```
Mac Address
10:F0:05:40:9D:F9

Computer Name
PowerPC

Student Name
Shenaya Weerasinghe

Student id
21038

1. Enter the value for calculate square value :74
1. Value:74      Square Value :5476      Written Time :Fri Jun 18 15:17:37 2021

2. Enter the value for calculate square value :58
2. Value:58      Square Value :3364      Written Time :Fri Jun 18 15:17:40 2021

3. Enter the value for calculate square value :34
3. Value:34      Square Value :1156      Written Time :Fri Jun 18 15:17:43 2021

4. Enter the value for calculate square value :75
4. Value:75      Square Value :5625      Written Time :Fri Jun 18 15:17:47 2021

5. Enter the value for calculate square value :96
5. Value:96      Square Value :9216      Written Time :Fri Jun 18 15:17:49 2021

6. Enter the value for calculate square value :32
6. Value:32      Square Value :1024      Written Time :Fri Jun 18 15:17:53 2021

7. Enter the value for calculate square value :78
7. Value:78      Square Value :6084      Written Time :Fri Jun 18 15:17:57 2021

8. Enter the value for calculate square value :78
8. Value:78      Square Value :6084      Written Time :Fri Jun 18 15:18:00 2021

9. Enter the value for calculate square value :63
9. Value:63      Square Value :3969      Written Time :Fri Jun 18 15:18:04 2021

10. Enter the value for calculate square value :25
10. Value:25     Square Value :625       Written Time :Fri Jun 18 15:18:12 2021
```

05. Computer Information

- Student number
- Student Name
- The MAC address of the computer
- The name of the computer



Saved File

Discussion and Knowledge the I have achieved