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Lab Session 4

Lab 4.1

(1 point) Exercise 1: Retrieve `initialize.cpp` and run the program using different numbers. Enter below the numbers you used to run the program, and record the output.

Input	Output
5	Hey that's a coincidence
2	Hey that's a coincidence
6	Hey that's a coincidence
8	Hey that's a coincidence
9	Hey that's a coincidence
50	Hey that's a coincidence
59	Hey that's a coincidence
59	Hey that's a coincidence
11	Hey that's a coincidence

(2 points) Does the program producing valid results? Why/why not?

No Because, in if condition it is assigning value of num1 to num2 but does not have equality operator. so that condition always excuted.

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

int main() {

    int num1;
    int num2 = 5;

    cout << "Please enter an integer" << endl;
    cin >> num1;

    cout << "num1 = " << num1 <<" and num2 = " << num2 << endl;

    if (num1 = num2) {
        cout << "Hey thats a coincidence!" << endl;
    }
     if (num1 != num2) {
        cout << "The values are not same ";
    }
    system("pause>0");

}
```

```
Select E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please enter an integer
7
num1 = 7 and num2 = 5
The values are not same
```

(3 points) Exercise 2 & 3: Modify `initialize.cpp` so that the user inputs both values to be tested (must have a prompt for each input). If the numbers are the same, print the lines shown in Exercise 3 of the lab manual. Test your modified program with pairs of same and different numerical values. Attach the printout of the modified `initialize.cpp`

Exercise 2

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

int main() {

    int num1;
    int num2;

    cout << "Please enter an integer" << endl;
    cin >> num1;

    cout << "Please enter an integer" << endl;
    cin >> num2;

    cout << "num1 = " << num1 <<" and num2 = " << num2 << endl;

    if (num1 == num2) {
        cout << "Hey thats a coincidence!" << endl;
    }
     if (num1 != num2) {
        cout << "The values are not same ";
    }
    system("pause>0");
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please enter an integer
5
Please enter an integer
6
num1 = 5 and num2 = 6
The values are not same
```

Exercise 3

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

int main() {

    int num1;
    int num2;

    cout << "Please enter an integer" << endl;
    cin >> num1;

    cout << "Please enter an integer" << endl;
    cin >> num2;

    cout << "num1 = " << num1 <<" and num2 = " << num2 << endl;

    if (num1 == num2) {
        cout << "The values are same" << endl;
        cout << "Hey thats a coincidence!" << endl;

    }
     if (num1 != num2) {
        cout << "The values are not same ";
    }
    system("pause>0");
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please enter an integer
5
Please enter an integer
5
num1 = 5 and num2 = 5
The values are same
Hey thats a coincidence!
```

(3 points) Exercise 4: Replace the two if statements with a single if/else statement. Make sure you are getting the same results as in exercise 2 and 3. Attach the printout of the modified `initialize.cpp`

Exercise 4

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

int main() {

    int num1;
    int num2;

    cout << "Please enter an integer" << endl;
    cin >> num1;

    cout << "Please enter an integer" << endl;
    cin >> num2;

    cout << "num1 = " << num1 <<" and num2 = " << num2 << endl;

    if (num1 == num2)
    {
        cout << "The values are same" << endl;
    }

    else
    {
        cout << "The values are not same" << endl;
    }
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Please enter an integer
5
Please enter an integer
6
num1 = 5 and num2 = 6
The values are not same
```

Lab 4.2

(1 point) Exercise 1: Retrieve `grades.cpp` and run the program using the following averages. Record the output for the program below.

Average	Output
80	You Pass
55	You Fail
60	You Pass

(3 points) Modify `grades.cpp` so that the program prints "You Pass" when the average is 60. Attach the printout of the modified `grades.cpp`

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

int main()
{
    float average;

    cout << "Input your average:" << endl;
    cin >> average;

    if (average >= 60)
        cout << "You Pass" << endl;

    if (average < 60)
        cout << "Fail" << endl;

    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Input your average:
60
You Pass
```

(3 points) Exercise 2: Modify `grades.cpp` so it uses an if/else statement rather than two if statements. Attach the printout of the modified `grades.cpp`

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

int main()
{
    float average;

    cout << "Input your average:" << endl;
    cin >> average;

    if (average >= 60)
    {
        cout << "You Pass" << endl;
    }

    else if (average < 60)
    {
        cout << "You Fail" << endl;
    }

    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Input your average:
50
You Fail
```

(3 points) Exercise 3: Modify `grades.cpp` so it handles the following categories: Invalid data (data above 100), ‘A’ category (90 – 100), ‘B’ category (80 – 89), “You Pass” category (60 – 79), ”You Fail” category (0 – 59). Attach the printout of the modified `grades.cpp`

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

int main()
{
    float average;

    cout << "Input your average:" << endl;
    cin >> average;

    if (average > 100) {
        cout << "Invalid data" << endl;
    }
    else if (average > 90 || average < 100) {
        cout << "You Pass" << endl;
    }
    else if (average > 80 || average < 89) {
        cout << "You Pass" << endl;
    }
    else if (average > 60 || average < 79) {
        cout << "You Pass" << endl;
    }
    else {
        cout << "You Fail" << endl;
    }
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
Input your average:
85
You Pass
```

(1 point) What happens when you enter a negative value such as –12?
<u>It will print nothing because there was no condition for negative numbers</u>

Lab 4.3
(2 points) Exercise 1: Retrieve `LogicalOp.cpp` and re-write the first if statement using the logical complement of gpa >= 2.0 and the NOT operator:

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

int main() {

    char year;
    float gpa;

    cout << "What year student are you? " << endl;
    cout << "Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)"
        << endl << endl;
    cin >> year;

    cout << "Now enter your GPA " << endl;
    cin >> gpa;

    if (!(gpa >= 2.0) && year == '4')
        cout << "It is time to graduate soon " << endl;

    else if (year != '4' || gpa < 2.0)
        cout << "You need more schooling " << endl;

    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What year student are you?
Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)

4
Now enter your GPA
1.5
It is time to graduate soon
```

(2 points) Exercise 2: Could you replace year != ‘4’ in the else if statement with year < 4 or year <= 3? Why or why not?

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

int main() {

    char year;
    float gpa;

    cout << "What year student are you? " << endl;
    cout << "Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)"
        << endl << endl;
    cin >> year;

    cout << "Now enter your GPA " << endl;
    cin >> gpa;

    if (!(gpa >= 2.0) && year == '4')
        cout << "It is time to graduate soon " << endl;

    else if (year < '4' ||year <= '3' || gpa < 2.0)
        cout << "You need more schooling " << endl;

    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What year student are you?
Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)

3
Now enter your GPA
1.9
You need more schooling
```

(2 points) Exercise 3: Which students would graduate, and which students would not graduate if you made the changes suggested in exercise 3 of the lab manual?

```cpp
int main() {

    char year;
    float gpa;

    cout << "What year student are you? " << endl;
    cout << "Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)"
        << endl << endl;
    cin >> year;

    cout << "Now enter your GPA " << endl;
    cin >> gpa;

    if (gpa >= 2.0 || year == '4')
    {
        cout << "It is time to graduate soon" << endl;
    }
    else if(year != '4' || gpa < 2.0)
    {
        cout << "You need more schooling" << endl;
    }
    system("pause>0");
    return 0;
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What year student are you?
Enter 1 (freshman), 2 (sophomore), 3 (junior), or 4 (senior)

4
Now enter your GPA
3.0
It is time to graduate soon
```

Lab 4.4

(2 points) Exercise 1: Retrieve `switch.cpp` and remove the break statements from each of the cases. Describe the behavior of the program:

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

int main() {

    char grade;

    cout << "What grade did you earn in Programming I ?" << endl;
    cin >> grade;

    switch (grade)
    {
    case 'A': cout << "an A - excellent work !=" << endl;

    case 'B': cout << "you got a B - good job" << endl;

    case 'C': cout << "earning a C is satisfactory " << endl;

    case 'D': cout << "while D is passing, there is a problem" << endl;

    case 'F': cout << "You Fail" << endl;

    default: cout << "You did not enter an A, B, C, D, or F" << endl;

    }
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What grade did you earn in Programming I ?
F
You Fail
You did not enter an A, B, C, D, or F
```

(3 points) Exercise 2: Modify `switch.cpp` so that there's an additional switch statement that produces an output of "You Passed" when a grade of D or better is entered. Make sure your modified program has the same output as the sample run. Attach the printout of the modified `switch.cpp`

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

int main() {

    char grade;

    cout << "What grade did you earn in Programming I ?" << endl;
    cin >> grade;

    switch (grade)
    {
    case 'A': cout << "You Passed" << endl;
        break;

    case 'B': cout << "You Passed" << endl;
        break;

    case 'C': cout << "You Passed" << endl;
        break;

    case 'D': cout << "You Passed" << endl;
        break;

    switch (grade)
    {
    case 'A': cout << "an A - excellent work !=" << endl;
        break;

    case 'B': cout << "you got a B - good job" << endl;
        break;

    case 'C': cout << "earning a C is satisfactory " << endl;
        break;

    case 'D': cout << "while D is passing, there is a problem" << endl;
        break;

    case 'F': cout << "You Fail" << endl;
        break;

    default: cout << "You did not enter an A, B, C, D, or F" << endl;
        break;

    }
    system("pause>0");
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What grade did you earn in Programming I ?
B
You Passed
you got a B - good job
```

(3 points) Exercise 3: Modify `switch.cpp` so that instead of a switch statement, you use if and else if statements. Use the trailing else in your new version. Attach the printout of the modified `switch.cpp`

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

int main() {

    char grade;

    cout << "What grade did you earn in Programming I?" << endl;
    cin >> grade;

    if (grade == 'A') {cout << "You Passed" << endl;}
    else if (grade == 'B'){cout << "YoU Passed" << endl; }
    else if (grade == 'C') { cout << "YoU Passed" << endl; }
    else if (grade == 'D') { cout << "YoU Passed" << endl; }

    if(grade =='A'){ cout << "an A - excellent work !" << endl; }
    else if (grade == 'B') { cout << "You got a B - good job" << endl; }
    else if (grade == 'B') {cout << "earning a C is satisfactory" << endl;}
    else if (grade == 'C'){ cout << "while D is passing, there is a problem" << endl; }
    else if (grade == 'F') { cout << "Better luck next Time" << endl; }
    else { cout << "You did not enter A,B,C,D,E,or F" << endl; }
    system("pause>0");
}
```

```
E:\Study Materials\C++\Death note\x64\Debug\Death note.exe
What grade did you earn in Programming I?
D
YoU Passed
You did not enter A,B,C,D,E,or F
```

(1 point) What does the trailing else correspond to in the original program with the switch statement? ***Default***