Computer Programming Fundamentals

Handsout No. 6

1. Operators (Part 3)
    a. Combine Arithmetic and Assignment Operators.
    b. Incremental and decremental Operators.
2. Flow control (Part 2)
    a. Conditions
        i. switch case

1. Operators (part 3)

1.1. Combine Arithmetic and Assignment Operators

A common use of the assignment and arithmetic operators is to operate on a variable and then to save the result back into that same variable. These operations can be shortened with the combined assignment operators.

```
int x = 0;
x += 5;           /* x = x+5; */
x -= 5;           /* x = x-5; */
x *= 5;           /* x = x*5; */
x /= 5;           /* x = x/5; */
x %= 5;           /* x = x%5; */
```

1.2. Increment and Decrement Operators

Another common operation is to increment or decrement a variable by one. This can be simplified with the increment (++) and decrement (--) operators.

```
x++; /* x = x+1; */
x--; /* x = x-1; */
```

Both of these can be used either before or after a variable.

```
x++; /* post-increment */
x--; /* post-decrement */
++x; /* pre-increment */
--x; /* pre-decrement */
```

The result on the variable is the same whichever is used. The difference is that the post-operator returns the original value before it changes the variable, while the pre-operator changes the variable first and then returns the value.

```
int x, y;
x = 5;
y = x++; /* y=5, x=6 */
x = 5;
y = ++x; /* y=6, x=6 */
```

Example:

```
#include<iostream>
using namespace std;
int main()
{
    int i=2,c=0;
    c = i + i++;
    cout<<c;
    return 0;
}
```

2. Flow Control

2.1. Conditions

2.1.1. switch case

The switch statement checks for equality between an integer and a series of case labels, and then passes execution to the matching case. It may contain any number of case clauses, and it can end with a default label for handling all other cases.

```
switch (x)
{
 case 0:
     cout<<"x is 0";
     break;
 case 1:
     cout<<"x is 1";
     break;
 default:
     cout<<"x is not 0 or 1";
     break;
}
```

Note that the statements after each case label end with the break keyword to skip the rest of the switch. If the break is left out, execution will fall through to the next case, which can be useful if several cases need to be evaluated in the same way.

Example:
Simple calculator in C++

```
#include<iostream>
using namespace std;
int main()
```

```
{
    int input;
    cout<<"Select Arithmetic Operation From The List Below: "<<endl;
    cout<<"1. Add "<<endl;
    cout<<"2. Subtract "<<endl;
    cout<<"3. Multiply "<<endl;
    cout<<"4. Division "<<endl;
    cout<<" Enter Your Choice Number (1-4) : "<<endl;
    cin>>input;
    double x,y,z;
    switch(input)
    {
        case 1:
            cout<<"Enter First Number: "<<endl;
            cin>>x;
            cout<<"Enter Second Number: "<<endl;
            cin>>y;
            z=x+y;
            cout<<x<<" + "<<y<<" = "<<z<<endl;
            break;
        case 2:
            cout<<"Enter First Number: "<<endl;
            cin>>x;
            cout<<"Enter Second Number: "<<endl;
            cin>>y;
            z=x-y;
            cout<<x<<" - "<<y<<" = "<<z<<endl;
            break;
        case 3:
            cout<<"Enter First Number: "<<endl;
            cin>>x;
            cout<<"Enter Second Number: "<<endl;
            cin>>y;
            z=x*y;
            cout<<x<<" * "<<y<<" = "<<z<<endl;
            break;
        case 4:
            cout<<"Enter First Number: "<<endl;
            cin>>x;
            cout<<"Enter Second Number: "<<endl;
            cin>>y;
            if( y != 0)
            {
                z=x/y;
```

```
                cout<<x<<" / "<<y<<" = "<<z<<endl;
            }
            else
            {
                cout<<"Error: Cannot divide by zero "<<endl;
            }
        break;
        default:
            cout<<"You entered a wrong choice "<<endl;

    }
    return 0;
}
```

Another Example:
How many days are in the month?

```
#include<iostream>
using namespace std;
int main()
{
    int month;
    cout<<"How many days are in the month? "<<endl;
    cout<<"Enter The Month Sequence Number: "<<endl;
    cout<<" 1. Jan   2. Feb   3. Mar "<<endl;
    cout<<" 4. Apr   5. May   6. Jun "<<endl;
    cout<<" 7. Jul   8. Aug   9. Sep "<<endl;
    cout<<"10. Oct  11. Nov  12. Dec "<<endl;
    cout<<"Enter Your Choice: "<<endl;
    cin>>month;

    switch(month)
    {
        case 1:
        case 3:
        case 5:
        case 7:
        case 8:
        case 10:
        case 12:
```

```
            cout<<"There are 31 Days."<<endl;
        break;
        case 4:
        case 6:
        case 9:
        case 11:
           cout<<"There are 30 Days."<<endl;
        break;
        case 2:
            cout<<"There are 28 or 29 Days."<<endl;
        break;
        default:
            cout<<"Entered Sequence is Wrong."<<endl;
    }
    return 0;
}
```