

CS150 Intro to CS I

Fall 2016

Chapter 5

Increment, Decrement, Looping

- Reading: pp. 227-232
- Good Problems to Work: p.232 [5.1], p.241 [5.2, 5.3]

Review

Write a `while` loop that lets the user enter a number. The number should be multiplied by 10 and the result stored in the variable `product`. The loop should iterate as long as the `product` contains a value less than 100.

Combined Assignments

- We have seen that the same variable can be used on the left hand side of the assignment and on the right hand side

```
notes = notes / 20;
```

```
notes = notes % 20;
```

- These are common in programming, so the two operators can be combined as follows:

```
notes /= 20;
```

```
notes %= 20;
```

Combined Assignments

- Combined assignments can be combined with arithmetic operators

```
y -= a * 2;
```

```
a /= b + c;
```

```
c %= d - 3;
```

- What is the long form of these statements?

Increment and Decrement Operators

- C++ provides a shortcut to increment or decrement a variable by 1
 - Always by 1

```
int x = 99;
```

```
x++; // this is equivalent to x += 1
```

```
x--; // this is equivalent to x -= 1
```

Prefix and Postfix

Prefix	Postfix
<code>k = --x;</code>	<code>k = x--;</code>
<code>k = ++x;</code>	<code>k = x++;</code>
Increment/decrement <code>x</code> then assign value of <code>x</code> to <code>k</code>	Assign value of <code>x</code> to <code>k</code> , then increment or decrement <code>x</code>

What is the Output?

```
int y = 0, x = 0, z = 0;

x = y++;

cout << x << " " << y << " "
     << z << endl;

y = ++z;

cout << x << " " << y << " "
     << z << endl;

z = x++ + 1;

cout << x << " " << y << " "
     << z << endl;
```


Tricky ... What is the Output?

```
int count = 0, sum = 0;
while (count++ < 5)
{
    sum += count;
    ++count;
    cout << count << ' ' << sum << endl;
}
cout << count << ' ' << sum << endl;
```

Input Validation

```
cout << "Enter a number in range 1-10: ";
cin >> number;
while (number < 1 || number > 10)
{
    cout << "Enter a number in range 1-10: ";
    cin >> number;
}
```