CS150 Intro to CS I

Fall 2017
Chapter 5
Increment, Decrement, Looping

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

  \[ y -= a \times 2; \]
  \[ a /= b + c; \]
  \[ c %= d - 3; \]

- 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

```cpp
int x = 99;

x++; // this is equivalent to x += 1
x--; // this is equivalent to x -= 1
```
Prefix and Postfix

Prefix
\[ k = --x; \]
\[ k = ++x; \]

Increment/decrement \( x \) then assign value of \( x \) to \( k \)

Postfix
\[ k = x--; \]
\[ k = x++; \]

Assign value of \( x \) to \( k \), then increment or decrement \( x \)
What is the Output?

```cpp
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?

```cpp
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;
}