CS150 Intro to CS I

Fall 2014
Chapter 5
Loops and Files

• Reading: Chapter 5 (5.2 pp. 232-238)
Loops

- A loop is a section of code that repeats
- C++ has three looping control structures:
  1. while
  2. for
  3. do-while
- The difference in these structures is how the repetition is controlled
while loop

- pre-tested loop
- General format

```cpp
while (expression) {
    // statements
}
```
while Loop Example

- Let the user determine how many times to run the loop.

```cpp
int theCounter = 0; // initialize the counter
int maxValue;

cout << "How many times should we run the loop? " ;
cin >> maxValue;

while ( ) // test the counter
{
    cout << "theCounter : " ;
    cout << theCounter << endl;
    // update the counter
}
```
Practice

- Write a snippet of code that will ask the user for an integer. Print the integers from 0 to the square of the number (inclusive) the user supplied.
Running Totals

- Write a snippet of code using a while loop that will calculate the sum of all the integers from 0 to 10.

- Write a snippet of code that will ask the user for a number. Print the sum of all the integers from 0 to the number the user supplied.
Example

- How many inches of rain did we get last week?

```cpp
const int DAYS_IN_A_WEEK = 7;
int currentDay = 1; // initialize the counter
double totalRain = 0.0; // initialize the total
double currentRain;

// loop for each day in a week
while (currentDay <= DAYS_IN_A_WEEK) // test the counter
{
    cout << "How much rain fell on day " << currentDay << " : ";
    cin >> currentRain;
    totalRain += currentRain;

    ++currentDay; // update the counter
}
cout << "The total rainfall last week was ";
cout << fixed << setprecision(2) << totalRain;
```
Practice

• Write a snippet of code that will ask the user for a number. Print the sum of all the even numbers from 0 to the square of the number the user supplied.
Practice

- Write a snippet of code that will ask the user for an integer. Print all the integers from 0 to the number the user supplied as well as the running total of the integers.

Enter a number: 3
counter running total
0 0
1 1
2 3
3 6
Practice

• Write a snippet of code that will ask for a student’s exam score and then print the appropriate letter grade (A, B, C, D, F).

• Continue asking for exam scores and printing letter grades until the user enters a negative exam score

```java
double examScore;
```