For Loop

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• C++ provides another way for us to repeat our tasks
• This is called a for loop
• For loop has the same three parts as the while loop:
  – Initialize Counter
  – Comparison on Counter
  – Update Counter
Why did C++ provide two types of looping constructs?

The for loop is designed with conveniences of the programmer in mind.

When designing programs you think ahead of time how many times the loop needs to be repeated.

C++ for loops are setup that exact way.
Model:
for( initialize ; comparison ; update )
{
   //do something here many times
}
• Notice that the three parts of the while loop is pack together in one place in the for loop.
Example:

```java
for( int c = 1 ; c <= 10 ; ++c )
{
    //do something here 10 times
}
```
While Loop vs. For Loop

• There are no definitive rules stating when to use which loop, here are my recommendations:

• Use while loop if...
  — Do not know number of times to loop in advance
  — Loop condition is based on user input

• Use for loop if...
  — Number of times to loop is known in advance
  — If nesting loops is needed for logical flow
For loops and while loops are very similar; you can turn any while-loop into an equivalent for-loop and vice versa.

```java
initialization
while (boolean statement) {
    perform action(s)
    update
}
```

```java
for (initialization; boolean statement; update) {
    perform action(s)
}
```
```cpp
int count = 1; //initialization
while (count <= 10) {
    cout << count;
    ++count; //update
}

for (int count = 1; count <= 10; ++count){ //more compact
    cout << count << " ";
}

Output (For Both Loops)
1 2 3 4 5 6 7 8 9 10
```