



For Loop

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Repeating Tasks



- 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

Two type of loops, why?



- 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.

For Loop Model



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.

For Loop Model Example



Example:

```
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 <--> While Loop

For loops and while loops are very similar; you can turn any while-loop into an equivalent for-loop and vice versa.

```
initialization
```

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



```
for (initialization; boolean statement; update) {  
    perform action(s)  
}
```

For Vs While Example

```
int count = 1;           //initialization
while (count <= 10) {   //test
    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