
for Loops

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for loops (5.8)

- 3 main things for loops:
 - Initialization of lcv, testing of lcv, updating lcv
- for loops provide a concise way to do this

```
for (count = 0; count < 5; count++)  
{  
    cout << count << endl;  
}
```

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Comparing for and while

- This for loop

```
for (count = 0; count < 5; count++)  
{  
    cout << count << endl;  
}
```

- is equivalent to

```
count = 0;  
while(count < 5)  
{  
    cout << count << endl;  
    count ++;  
}
```

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General Format

```
for (initialization expression;  
    loop repetition condition; update  
    expression)  
{  
    statements;  
}
```

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15.1 Example

- What is the output of the following loop

```
int count;  
for (count = 0; count < 10; count += 2)  
{  
    cout << count << endl;  
}
```

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15.2 Practice

- Write a `for` loop that outputs odd numbers less than 10 and greater than 0

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15.3 Practice

- Write a program that computes the factorial of a number. The factorial of a number is given by the formula
 - $N! = N*(N-1)*... *2*1$
 - where $0!=1, 1!=1, 2!=2, 3!=6, ...$

15.4 Localized Declarations

```
for (int i = 0; i < n; i++)
{
    cout << i << endl;
}
cout << i << endl; // This will cause an error
```

- **i** is declared ONLY in the loop
- Convert this to a **while** loop

15.5 Practice

- Rewrite the following **for** loop as a **while** loop
- ```
for (i = 5; i < 10; i+= 2)
{
 cout << i;
}
```
- What does this output?

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## 15.6 Problem

- Write a program that will print the sum of the odd integers between 1 and 50. Write one program using a while and the other using a for loop

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## 15.7 Potential Pitfalls

- What is the output of the following loop
- ```
for (int count = 0; count < 5; count++)  
{  
    cout << count << endl;  
    count++;  
}
```

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15.8 Problem

- Write a program that allows the user to enter 20 integers, you should then print out the following:
 - The sum of all integers inputted
 - The average of all integers inputted
 - The largest integer of all integers inputted

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