

Homework #2 - Loops

Name:

1 For loops

Just like Python, C++ has both "while" and "for" loops. A "for" loop in C++ is written like this:

```
1 #include <iostream>
3 using namespace std;
5 int main() {
7     for (int i = 0; i < 10; i++) {
9         cout << i << endl;
11    }
12    return 0;
13 }
```

This code will print out the numbers from 0 - 9. In Python, you'd print the numbers from 0 - 9 like this:

```
2 for i in range(0,10):
   print i
```

What if we wanted to go through a list of both numbers and words? In Python, we could easily do that like this:

```
2 for i in ['banana', 'apple', 36]
   print i
```

Unfortunately, there is nothing like this in C++. For loops can only count up or down, they can't actually go "item by item" through a list containing different types of data. This is one of the big differences between C++ and Python.

2 While loops

While loops in C++ are a lot closer to their Python counterparts. A while loop looks like this:

```
1 #include <iostream>
2
3 using namespace std;
4
5 int main() {
6     int i = 0;
7     while (i < 10) {
8         cout << i << endl;
9         i++;
10    }
11
12    return 0;
13 }
```

One new thing here is the "i++". In C++ this means "add 1 to i". It's a bit like doing "i += 1" in Python...it's just shorter than writing "i = i + 1" and programmers love keeping things short!

3 Now You Try

3.1 Summing up numbers

Write a short C++ program which asks for a number, then adds up all the numbers from 1 up to that number. The output should be something like this:

```
Enter a number: 5
The sum is: 15
```

3.2 Countdown

Try writing a short program which counts from -1 to -99 by twos, like this:

```
-1
-3
-5
-7
...
-99
```

When should the loop stop? How much should you add or subtract from "i" each time the loop runs?