CS 161
Intro to CS I

Repetitive Execution/
Switch Statements
Chap. 2.3
The for Loop Examples

for(x=-100; x <= 100; x++)
    cout << “hello world” << endl;
for(x=2+2; x <= 17*3; x++)
    cout << “hello world” << endl;
for(x=0; x <= 100; x++)
    cout << “hello world” << endl;
for(x=0; x < 100; x++)
    cout << “hello world” << endl;
for(x=-100; x <= -1; x++)
    cout << “hello world” << endl;
The for Loop Examples

for(x=1; x <= 1; x++) {
    cout << “hello world” << endl;
}

for(x=1; x < 1; x++) {
    cout << “hello world” << endl;
}

• Why is it better to use curly braces?
The for Loop Pattern

for(<variable> = n; <variable> <= p; <variable>++) {
    <statement>;
    ...
}
for(<variable> = n; <variable> >= p; <variable>--) {
    <statement>;
    ...
}
Nested for Loops

for(x = 0; x < 10; x++) {
    for(y = 0; y < 10; y++) {
        cout << "hello world" << endl;
    }
}

• How many times is Hello World printed?
Reuse Variables

for(x = 0; x < 10; x++) {
    cout << “The value of x is: ” << x << endl;
}
for(x = 0; x < 10; x++) {
    cout << “The value of x is: ” << x << endl;
}
int x;
for(x = 0; x < 10; x++) {
    for(x = 0; x < 10; x++) {
        cout << “The value of x is: ” << x << endl;
    }
}

• What is the output from this nested loop?
Infinite Loops

```cpp
int x;
for(x = 0; x < 10; x++) {
    for(x = 0; x < 5; x++) {
        cout << "The value of x is: " << x << endl;
    }
}
```
Infinite Loops

```cpp
int x, y;
for(x = 0; x < 10; x++) {
    for(y = 0; y < 5; x++) {
        cout << "The value of x is: " << x << endl;
    }
}
```
Infinite Loops

int x, y;

for(x = 0; x < 10; x++) {
    for(y = 0; x < 5; y++) {
        cout << "The value of x is: " << x << endl;
    }
}

Infinite Loops

```cpp
int x;
for(x = 1; x <= 10; x++) {
    cout << "The value of x is: " << --x << endl;
}
```
Why is this good/bad?

```cpp
for(int x = 0; x < 10; x++) {
    for(int y = 0; y < 10; y++) {
        cout << "hello world" << endl;
    }
}

• Where can we access x and y?
```
Looping Recap...

• for loops
  – Repeat for specific number of times
  – Example?

• while loops
  – Repeat while a condition is being met
  – Example?

• do while loops
  – Always do once, and repeat while condition is met
  – Example?
What is a switch statement?

```java
switch( <expression> ) {
    case <const-expr>:
        <statement>;
    ...
    case <const-expr>:
        <statement>;
    ...
    default:
        <statement>;
    ...
}
```
C++ Switch Example

```cpp
switch( x ) {
    case 0:
        std::cout <<"X is zero\n";
        break;
    case 1:
        std::cout <<"X is one\n";
        break;
    case 2:
        std::cout <<"X is two\n";
        break;
    default:
        std::cout <<"You have entered an invalid number!!!\n";
}
```
C++ Switch Example

switch( x ) {
    case 0:
    case 1:
        std::cout << “X is zero or one
”;
        break;
    case 2:
        std::cout << “X is two
”;  
        break;
    default:
        std::cout << “You have entered an invalid number!!!
”;  
}
Reading/Assignments

• Assignment #2, Due Monday 4/22
• Read Ch. 3
Quiz #3

• What if we didn’t have a break in the case of a switch statement?

• How could you write an if/else to match not having breaks in this switch?

```cpp
switch( x ) {
    case 0:
    case 1:
        std::cout << “X is zero or one
”;  
    case 2:
        std::cout << “X is two
”; 
    default:
        std::cout << “You have entered an invalid number!!!
”;  
}
```

• What do you think this does in C++?

```cpp
<expression1> ? <expression2> : <expression3>
```