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**ITEC 120**

Lecture 8  
For

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### Review

- Questions?
- While / Sentinel / Break / Continue

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For loops

### Objectives

- Learn the difference between while and for
- Basic for syntax
- Examples

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For loops

### While

- 2 types of problems
  - Numeric control
  - Alphabetic control

```

int i=0;
while (i <10)
{
    i = i+1;
}

String command;
command = scan.nextLine();
while (!command.equals("quit"))
{
    command = scan.nextLine();
}

```

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For loops

## Numeric control

- Initial value
- Sentinel check
- Increment

```
int i=0;
while (i <10)
{
    i = i+1;
}
```

For loops

## Rationale

- Standard problem
- Problematic practice
  - Keeping track
  - Placement issues
  - Updating issues
- Need to simplify it

For loops

## For

- All in one place
  - Initial value
  - Sentinel check
  - Increment

```
int i=0;
while (i <10)
{
    i = i+1;
}

for (int i=0; i<10; i=i+1)
{
}
```

For loops

## English

- For a particular starting value, execute the block of code if the conditional is true, increment a variable, and check to see if we should execute it again

```
for (int i=0; i<10; i=i+1)
{
    //Block of code here
}
```

For loops

### Examples

`i++ == i+i-1`

```
for (int i=0; i<10; i++)
{
    System.out.println("SPAM");
}
```


What does this print?

```
int sum=0;
for (int i=0; i<10; i++)
{
    sum=sum+i;
}
System.out.println(sum);
```

What does this print?

For loops

### Pyramid Scheme



- Get a percentage of profit from those who generate money underneath you

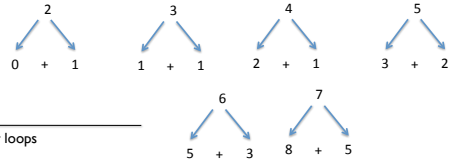
```
int purchaseAmount=10;
for (int numSuckers=0; numSuckers<10; num++)
{
    double val = numSuckers*(.05*purchaseAmount);
    System.out.println("Amount made with " + numSuckers
        + " underneath you: " + val);
}
```

For loops

### Example

Branching of trees  
Arrangement of leaves  
Uncurling fern

- Fibonacci Number (0-X)
  - 0 is 0
  - 1 is 1
  - X is the sum of X-1 and X-2



For loops

### Examples

```
int value=0;
for (int num=0; num<40; num+=10)
{
    value = value + num;
}
System.out.println(value);
```

```
int value=0;
for (int num=0; num<=40; num+=10)
{
    value = value + num;
}
System.out.println(value);
```

For loops

## Finding min

```
int min, val;
min = val = scan.nextInt();
for (int i = 0; i < 10; i++)
{
    val = scan.nextInt();
    if (min > val)
        min = val;
}
```

1. Assume first entry is what you are looking for
2. Read in another entry
3. Compare against assumption

For loops

## Finer control

```
int val = 0;
int sum = 0;
for (int i = 0; val != -1; i++)
{
    val = scan.nextInt();
    if (val <= 0)
        continue;
    sum = sum + val;
}
```

Read and sum numbers until -1  
Don't do anything w/ 0 though

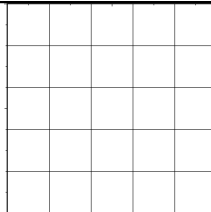
For loops

## 2D grid

- x,y location
- Need to perform action at each grid location

```
for (int i = 0; i < numRows; i++)
{
    for (int j = 0; j < numCols; j++)
    {
        System.out.println("At location " + i + ", " + j);
    }
}
```

For loops



## String parsing

Ever wonder how indexOf works?  
This splits a string into two parts  
Before and after the :

```
String input;
input = scan.nextLine();
String part1, part2;
part1 = part2 = "";
Boolean found = false;
for (int i = 0; i < input.length(); i++)
{
    if (input.charAt(i) == ':')
    {
        found = true;
    }
    if (!found)
        part1 = part1 + Char.toString(input.charAt(i));
    else
        part2 = part2 + Char.toString(input.charAt(i));
}
```

For loops

### String replace

- Need to find a particular character and replace it with another character
- How do we do this without the built-in java function...

For loops

### Review

- For loops
- Rationale
- Syntax
- Examples

For loops