ICS 141 Programming with Objects

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Loops

- Used for repetition

- while loops vs for loops – how to choose?
  - for loop if know how many times it is going to iterate
  - while loop if don't know how many times it is going to iterate

- Reminder about the condition check
  - Example: tubing down the river

Important shortcuts

Java expression	Equivalent shortcut	
i = i + 1	i++	(postfix increment)
	++i	(prefix increment)
i = i - 1	i--	(postfix decrement)
	--i	(prefix decrement)
i = i + n	i += n	
i = i - n	i -= n	
i = i * n	i *= n	
i = i / n	i /= n	

Recall while loops

- Condition controlled. (Keeps going as long as the condition evaluates to true)

- Body must include a way to update the condition (or you will be in an infinite loop)

- Syntax

  .....initialize condition......

  while(....some condition that evaluates to true or false....) {

  ....do something .....

  .... have ability to change condition in some way ......

  }

while statement Syntax

Python

Syntax

```
while condition:
    indented
    statement block
```

Example

```
count = 0
while count < 100:
    print ("Welcome")
    count = count + 1
```

Java

```
while (condition){
    statement block
}
```

```
int count = 0;
while (count < 100){
    System.out.println("Welcome");
    count = count + 1;
}
```

do...while Repetition Statement

–Another syntax to write the while loop

```
int counter = 11;
while ( counter <= 10 ) {
    System.out.println( counter );
    counter=counter+1;
}
```

```
int counter = 11;
do {
    System.out.println( counter );
    counter=counter+1;
} while (counter <= 10);
```

Try it!

- Open Eclipse and create a new Java project named GuessingGameApplication

- Create a class called GuessingGame. Include the main method. (This will be a one class application, so this class is the boss and the worker).

- Inside the main method, declare and instantiate a Scanner object and a Random object. The Random object has a method called nextInt(int bound). This returns a random number between 0 and bound – 1 (inclusive). Use this method to create a random number for a user to guess.

- Create a while loop that asks the user to guess a number. It continues until the user guesses the right number.

- For added functionality, consider telling the user their guess is too high or too low. How would you do that?

for statement Syntax

Syntax

```python
for x in []:
    statements
```

```java
for (initial_value; condition; step) {
    statements
}
```

Example

```python
for i in range(6):
    print (i)
```

```java
for (int i=0 ; i < 6; i++ ) {
    System.out.println(i);
}
```

Try it!

- In the main method, ask the user how many games they would like to play.

- Use a for loop to run the game that many times.