Lecture 3

0   Queries

1   More Functions

```
# functions can take no parameters
def this_function_returns_five():
    return 5

# functions can also not return anything
def print_hello():
    print "Hello!"
```

2   Boolean Expressions

2.1   Boolean Operators

```
>>> 1 < 2 and 7 == 5
False
>>> 1 < 2 or 7 == 5
True
>>> not 1 < 2
False
```

Talk about "!=".

2.2   Evaluate

Show them and then vote! While voting, talk about subsection 2.3.

2.3   Precedence Continued

- **
- unary −
- *, /, //, %
- +, −
- <, <=, >, >=, ==, !=
- **not**
- **and**
- **or**

3 Conditionals

What if we want code to only run sometimes? We need some way to tell Python to only run certain code under certain circumstances. Let's write a very basic guessing game!

```python
secret = 7

guess = int(input("Enter a number: ")) # Explain this!

if secret == guess: # This is called a conditional
    print("Congrats!  You were right!")
else:
    print("You lose!")
```

For reasons that we'll probably talk more about later, it's generally good practice to put the *main* part of your code in a function called `main`. Let's do that!

```python
def main():
    secret = 7

    guess = int(input("Enter a number: "))

    if guess == secret:
        print("Congrats!  You were right!")
    else:
        print("You lose!")

if __name__ == '__main__': # We then need to call the main function
    main()
```

Let's make the game better by telling the user if they were too high or too low.

```python
def main():
    secret = 7

    guess = int(input("Enter a number: "))

    if guess == secret:
        print("Congrats!  You were right!")
    else:
        if guess > secret:
            print("You were too high!")
        else:
            print("You were too low!")

if __name__ == '__main__':
    main()
```

Python allows us to make the **else**/**if** syntax a little nicer with **elif**.

```python
def main():
    secret = 7

    guess = int(input("Enter a number: "))

    if guess == secret:
        print("Congrats!  You were right!")
    elif guess > secret:
        print("You were too high!")
    else:
        print("You were too low!")

if __name__ == '__main__':
    main()
```

4   Conditional Practice

Do example code with:

- $x = 20$, $y = 0$ (ACDF)

- $x = 5$, $y = 5$ (AFG)

- $x = 33$, $y = 5$ (ABDFG)

- $x = 0$, $y = 0$ (AEF)

5   Format Print

```
>>> import math
>>> print("Pi is approximately", math.pi)
Pi is approximately 3.141592653589793
>>> print("Pi is {:.5f} to 5 decimal places.".format(math.pi))
Pi is 3.14159 to 5 decimal places.
>>> sqrt_2 = math.sqrt(2)
>>> print("Pi is {:.2f} and the sqrt of 2 is {:.3f}.".format(math.pi,
                                                  sqrt_2))
Pi is 3.14 and the sqrt of 2 is 1.414.
```

6   Project 1

Introduce the project. Talk about file redirection and diff.