Lesson 4

Introduction to IF Statements

As you continue to work through the lessons and expand your knowledge of Python (and coding in general!), you will be using if statements very regularly. Basically, if statements test if a condition is true or false. Let's go back to when we were first introduced to if statements in the Number Guessing Game.

```
randomNumber = random.randint(1, 10)  # generate random number between 1 and 10

guessedNum = (int)(input(" "))  # user inputs an INT that will be compared with the random value

if guessedNum == randomNumber:  # if the guessed number is equal to the randomly generated number
    print("You Won!") # code block inside the if statement
```

In the above example, the if statement is used to test if the guessed number that the user has inputted is equal to the randomly generated number.

Note: in programming "==" means "is equal to"

The code block inside the if statement ("print("You Won!")") will only run if the condition in the if statement is met.

How To Use "if" Statements

```
if what is in here is true:
    do what is in the code block after the if

otherwise just continue after the end of the code block
```

- If what is after if is true, then DO run the code in the code block (code with spaces).
- If what is before if is false, then DO NOT run the code in the code block.

How To Use “else” Statements

else statements can also be used along with if statements. They are usually used after an if statement and will only run the code in their code block if the condition in the previous if statement was not true.

```
if what is in here is true:
    do what is in the code block after the if
else:
    otherwise do what is in this code block after
```

- If what is after if is true, then run the code in that code block.
- If what is before if is false, then run the code in the else code block.

Below is an example of how to use if/else statements. Try it out for yourself!

Hint: Increase the value that is stored in the myNumber variable and see what happens!

```
myNumber = 5

if myNumber > 8: # if myNumber is GREATER THAN 8
    print "Number is greater than 8"
else: # if myNumber is NOT GREATER THAN 8
    print "Number is less than or equal to 8"
```

How To Use “elif” Statements

elif statements (short for “else if”) can also be used when more conditions are needed. They are usually used after an if statement and will only run the code in their code block if the condition in the previous if/elif statement was not true.

```
colour = input("What is your favourite colour? ") # user inputs their favourite colour

if colour == "red": # if the user said red
    print("Your favourite colour is red")
elif colour == "green": # or else if the user said green
    print("Your favourite colour is green")
elif colour == "blue": # or else if the user said blue
    print("Your favourite colour is blue")
else: # or else if the user said none of these
    print("Your favourite colour is something else...")
```

- If the user inputted the colour “red”, the program will print “Your favourite colour is red”. If the user inputted something else, the program will move onto the first elif statement.
- If the user inputted “green”, the program will print “Your favourite colour is green”. If the user inputted something else, the program will move onto the second elif statement. This step is repeated for if the user inputted “blue”.
- If the user inputted any colour other than “red”, “green” or “blue”, then the program will print “Your favourite colour is something else...”.

Tasks:

1. Ask the user if they are right-handed or left handed.

```
userInput = input("Are you right-handed or left-handed? (Type right or left) ")
```

2. If the user is right-handed, then print “You are right-handed”.
3. Or else if the user is left, then print “You are left-handed”.
4. Or else if the user inputs something completely different, then print something like “Unknown hand type...”.

If Item Is In/Not In List

If we have a list of objects, we can test to see if an objects is already in that list using if statements. For example:

```
numbers = [0, 2, 4, 6, 8, 10] # list of int numbers

if 4 in numbers:
    print "Number 4 is in the list"
else:
    print "Number 4 is not in the list"
```

You can also do this the opposite way where you test if an object is **not** in the list.

```
numbers = [1, 3, 5, 7, 9, 11] # list of int numbers

if 8 not in numbers:
    print "Number 8 is not in the list"
else:
    print "Number 8 is in the list"
```

Tasks:

1. Declare a list of strings that contain the names of a few different types of animals.
2. Test whether the following are in the list and print out whether they were found in the list or not:
    a. Bird
    b. Snake
3. Test whether the following are **not** in the list and print out whether they were found in the list or not:
    a. Cow
    b. Dog
4. Update your code so that if one of the animals given above is **not** already in the list, add it to the end of the list.

Castle Dragonsnax Project

You have snuck into a scary castle late at night and are presented with three, giant, wooden doors. Write a program that will ask the user to pick one of the three doors to open. Each door has a different consequence for the player when it is opened.

- One of the doors results in the player finding a giant room full of treasure - player wins.
- Another one of the doors results in the player being hit by a giant ogre's club - player loses.
- The final door will result in the player finding a sleeping dragon that awakes when it hears the player come in the room and eats the player.

Tasks:

1. Create the setting for the player by printing out an introduction to the story. For example:

```
print("You are in a dark mysterious castle.")
print("In front of you are three doors. You must choose one.")
```

2. Ask the user to input the door they wish to choose (1, 2 or 3).
3. If the user chooses door 1, print out that the player has found the treasure and the player has won.
4. Or else if the user chooses door 2, print out that the player has been hit by the ogre's club and the player has lost.
5. Or else if the user chooses door 3, print out that the player has been has found the dragon, has been eaten and the player has lost.
6. Or else if the player has chosen something else, print out that they must choose either door 1, 2 or 3.
7. Print out that the user must run the program again to have another go (at the end, outside of the if/elif/else statements).

Extra Tasks:

1. Add an extra layer of doors that the player will come upon **before** meeting the previous doors in the castle. Perhaps the first door that the player chooses will lead them to the great hall and another door will lead them to the grand staircase etc. (be creative!!!) where they will find the other three doors that we had previously.

   Hint: This task will require the use of nested if statements (if statement within another if statement code block). See the pseudo-code block below as an example.

```
if player chooses door 1:
    print something
    player chooses another door

    if player chooses door 4:
        print something only if door 1 was chosen originally
    elif player chooses door 5:
        print something else only if door 1 was chosen originally
    elif player chooses door 6:
        print something else only if door 1 was chosen originally
    else:
        print something only if door 1 was chosen originally
```