

Unit 14

Loops & List Comprehensions

Asg 14.2 (Coding)

```
In [5]: # set up notebook to display multiple output in one cell

from IPython.core.interactiveshell import InteractiveShell
InteractiveShell.ast_node_interactivity = "all"

print('The notebook is set up to display multiple output in one cell.')
```

The notebook is set up to display multiple output in one cell.

Practice Problem #1: Teams in the NFC North Division:

Bears
Lions
Packers
Vikings

Desired Output:

The Bears are in the NFC North Division.
The Lions are in the NFC North Division.
The Packers are in the NFC North Division.
The Vikings are in the NFC North Division.

- Write code that doesn't use iteration to print out the desired output.
- Create a list called `nfc_north` that contains the 4 teams that are in the NFC North Division. Then iterate over that list to produce the desired output.

```
In [6]: nfc_north = ["Bears", "Lions", "Packers", "Vikings"]
print("The Bears are in the NFC North Division.\n"
      "The Lions are in the NFC North Division.\n"
      "The Packers are in the NFC North Division.\n"
      "The Vikings are in the NFC North Division.\n")

for x in nfc_north:
    print(f"The {x} are in the NFC North Division.")
```

The Bears are in the NFC North Division.
The Lions are in the NFC North Division.
The Packers are in the NFC North Division.
The Vikings are in the NFC North Division.

The Bears are in the NFC North Division.
The Lions are in the NFC North Division.
The Packers are in the NFC North Division.
The Vikings are in the NFC North Division.

Practice Problem #2: Write code that incorporates the range() function in a for loop to print out the first 5 terms of the following arithmetic sequence:

7, 12, 17, 22, 27

```
In [7]: for x in range(7, 30,5):  
        print(x, end=" ")
```

7 12 17 22 27

Practice Problem #3: Write code that incorporates the range() function and produces the specified output.

- a. [0, 1, 2, 4, 4, 5, 6]
- b. [8, 9, 10, 11, 12]
- c. [5, 9, 13, 17, 21, 25]
- d. [5, 4, 3, 2]
- e. [31, 24, 17, 10, 3]

```
In [8]: a = []  
        for x in range(7):  
            a.append(x)  
        print(a)  
  
        b = []  
        for x in range(8,13):  
            b.append(x)  
        print(b)  
  
        c = []  
        for x in range(5, 26,4):  
            c.append(x)  
        print(c)  
  
        d = []  
        for x in range(5, 1,-1):  
            d.append(x)  
        print(d)  
  
        e = []  
        for x in range(31, 2, -7):
```

```
e.append(x)
print(e)
```

```
[0, 1, 2, 3, 4, 5, 6]
[8, 9, 10, 11, 12]
[5, 9, 13, 17, 21, 25]
[5, 4, 3, 2]
[31, 24, 17, 10, 3]
```

Practice Problem #4: a. Use a for loop to add the first 7 perfect squares.

b. Use a while statement to add the first 7 perfect squares.

```
In [9]: total = 0
        for x in range(8):
            total += (x**2)
        print(total)

        total = 0
        x=0
        while x < 8:
            total += (x**2)
            x+=1
        print(total)
```

```
140
140
```

Practice Problem #5: Use a for loop to iterate over each character in the string "Matt Amodio just won 38 straiht games of Jeopardy."

```
In [10]: Matt_String = "Matt Amodio just won 38 straiht games of Jeopardy."

        for ch in Matt_String:
            print(ch,end="")
```

```
Matt Amodio just won 38 straiht games of Jeopardy.
```

Practice Problem #6: a. Use the len of the given string as the range() function parameter value to iterate over each character in the string "Halloween".

b. Use the len of the given string as part of a range() function parameter value to iterate in reverse over each character in the string "Halloween".

```
In [11]: halloween = "Halloween"
        for x in range(len(halloween)):
            print(halloween[x], end="")
        print("\n")

        for x in range(len(halloween) - 1, -1, -1):
            print(halloween[x],end="")
```

Halloween

neewollaH

Practice Problem #7: Use a while loop to generate index values to iterate over each character in the string "Jack O'Lantern".

```
In [12]: jack = "Jack O'Lantern"
x = 0
while x < len(jack):
    print(jack[x],end="")
    x+=1
```

Jack O'Lantern

Practice Problem #8: Use list traversal to print out the following list one item at a time.

candy_bars = ["Milky Way", "Snickers", "3 Muskateers"]

```
In [13]: candy_bars = ["Milky Way", "Snickers", "3 Musketeers"]
for x in candy_bars:
    print(x)
```

Milky Way
Snickers
3 Musketeers

Practice Problem #9: Use list comprehension to print out the sequence 2, 9, 16, 23, 30, 37 as a list.

```
In [14]: list = []
for x in range(2,38,7):
    list.append(x)
print(list)
```

[2, 9, 16, 23, 30, 37]

In []: