

Session 2: Introduction to Python II

Section 1: Comparisons and Conditionals

Exercise 1: Comparison Operators

Began learning about and using comparison operators using W3Schools.

Exercise 2: Logical Operators

Began learning about and using logical operators using W3Schools.

Exercise 3: if

Started new file "lab_week_2.py" and copied code into file, changed variable value.

Following code uses age variable to print different output depending on what the variable is set to (If the number is under 18, output is child. If the number is over 18, output is adult)

```
age = 15
age_group = "child"

if age > 18:
    age_group = "adult"

print(f"The age group is {age_group}")
```

Output

```
The age group is child
```

Exercise 4: if-else

Copied code into python file and changed variable.

Following code uses wind speed variable and outputs differently dependent upon what number is defined. (If wind speed is less than 10, output "calm day," otherwise print "windy day")

```
wind_speed = 5

if wind_speed < 10:
    print("It is a calm day")
else:
    print("It is a windy day")
```

Output

```
It is a calm day
```

Exercise 5: if-elif-else

Copied code into python file and changed variable value.

Following code uses grade variable to output different output dependent upon the score relative to the comparison operators. Each statement has a different output.

```
grade = 5

if grade < 50:
    print("You failed")
elif grade < 60:
    print("You passed")
elif grade < 70:
    print("You got a good pass")
else:
    print("You got an excellent pass")
```

Output

```
You failed
```

Exercise 6: Summary

Created 2 variables (Temp1, Temp2) and assigned different values.

Used an if else statement to compare the two numbers and output a statement dependent upon whether they were equal or not.

```
Temp1 = 20
Temp2 = 30

if Temp1 == Temp2:
    print("The temperatures are equal")
else:
    print("The temperatures are not equal")
```

Output

The temperatures are not equal

Section 2: Python Lists

Exercise 1: Creating a list

Created a list of cities containing "Glasgow", "London", and "Edinburgh."

```
city_list = ["Glasgow", "London", "Edinburgh"]
```

Exercise 2: Accessing a list

Code prints the third item within the list then uses slicing to print the first two seperately

```
capital = city_list[2]
others = city_list[0:2]

print(capital)
print(others)
```

Output

```
Edinburgh
['Glasgow', 'London']
```

Exercise 3: Modifying a list

Added "Manchester" to the list and replaced "London" with Birmingham

```
city_list.append("Manchester")
city_list[1] = "Birmingham"

print(city_list)
```

Output

```
['Glasgow', 'Birmingham', 'Edinburgh', 'Manchester']
```

Exercise 4: Summary

Created list "colours" containing 3 colours as strings.

List is printed, then second colour is printed using separate variable "red_colour"

First colour ("blue") is changed to "orange."

Length of list is printed.

Conditional if statement used to check whether "red" is in the list" and outputs accordingly.

Used slicing to create a new list called "selected_colours" containing only the second and third colours, then printed it.

```
colour_list = ["blue", "red", "white"]
print(colour_list)

red_colour = colour_list[1]
print(red_colour)

colour_list[0] = "orange"
print(colour_list)

colour_list_length = len(colour_list)
print(colour_list_length)

if "red" in colour_list :
    print("Red is in the list")
else:
    print("Not in the list")

selected_colours = colour_list[1:3]
print(selected_colours)
```

Output

```
['blue', 'red', 'white']
red
['orange', 'red', 'white']
3
Red is in the list
['red', 'white']
```

Section 3: Python Loops

Exercise 1: While Loops

Used W3Schools to learn about and start using while loops.

Exercise 2: For Loops

Used city_list from earlier and printed each city using a for loop

```
for city in city_list:  
    print(city)
```

Output

```
Glasgow  
Birmingham  
Edinburgh  
Manchester
```

Exercise 3: Loop Keywords: Range, break and continue.

Used for loop to print numbers 0 through 4, but stops when the loop reaches 3.

```
for i in range(5):  
    print(i)  
    if i == 3:  
        break
```

Output

```
0  
1  
2  
3
```

Exercise 4: Summary Tasks

Task 1: Even Numbers

Created a list "numbers" which contains numbers 1-10. Used a for loop to only print even numbers

```
numbers = list(range(1, 11))  
  
for num in numbers:  
    if num % 2 == 0:  
        print(num)
```

Output

```
2  
4  
6  
8  
10
```

Task 2: Sum of Squares

Created variable "sum_of_squares" and set it to 0.

Used a for loop to iterate through numbers 1-5.

Added the square of each number.

Printed the final value of "sum_of_squares."

```
sum_of_squares = 0  
  
for num in range(1, 6):  
    sum_of_squares += num ** 2  
print(sum_of_squares)
```

Output

```
55
```

Task 3: Countdown

Created variable "countdown" and set it to 10.

Used a while loop to iterate and print a countdown to the number 1.

Once the countdown = 0, prints "Liftoff!"

```
countdown = 10  
  
while countdown > 0:  
    print(countdown)  
    countdown -= 1  
  
print("Liftoff!")
```

Output

```
10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
Liftoff!
```

Section 4: Obtaining User Input

Exercise 1: User Input

Task 1: User Input and Conditional Statements

Used input to create value "age" and made it an integer.

Used if and elif statements to output a different statement dependent upon the age input

```
age = input("How old are you? ")  
  
age = int(age)  
  
if age < 18:  
    print("You are a minor")  
elif age > 18:  
    print("You are an adult")  
elif age > 65:  
    ("You are a senior citizen")
```

Output

```
How old are you? 15  
You are a minor
```

Task 2: Temperature Convertor

Used previously created temperature convertor and modified it to take user input.

User inputs a temperature in celsius and allows them to chose which temperature to convert to (Fahrenheit or Kelvin.)

```
celsius_input = input("Enter a Temperature in Celsius: ")
celsius_float = float(celsius_input)

temp_converter = input("What would you like to convert to? Please enter F or K: ")

print("Welcome to the Temperature Converter")
print("The temperature you have entered is ", celsius_input, " degree Celsius.")
print("Converted Temperatures")

if temp_converter == "F":
    degree_f = celsius_float * 9/5 + 32
    degree_f_decimal = "{:.2f}".format(degree_f)
    print("You have chosen Farenheit.")
    print(celsius_input, "degree Celsius is equal to ", degree_f_decimal, " Fahrenheit.")

if temp_converter == "K":
    degree_k = celsius_float + 273.15
    print("You have chosen Kelvin.")
    print(celsius_input, "degree Celsius is equal to ", degree_k, " Kelvin.")

print("Thank you for using the Temperature Converter!")
```

Output

```
Enter a Temperature in Celsius: 15
What would you like to convert to? Please enter F or K: F
Welcome to the Temperature Converter
The temperature you have entered is 15 degree Celsius.
Converted Temperatures
You have chosen Farenheit.
15 degree Celsius is equal to 59.00 Farenheit.
Thank you for using the Temperature Converter!
```