Tutorial II

Intermediate Python Programming

4 – Iteration.

Resources created by Andy Colley (@MrAColley)

Learning Goals/Objectives

Be able to read, comprehend, trace, adapt and create Python code using selection that:

- Uses **conditional iteration** (while loops)
- **Validates** user input
- **Repeats whilst** the user does not input the desired data.

repl.it

Validation With **Conditional** Iteration

Validation

Checking whether data entered is **reasonable, sensible** and **allowable.**

Sometimes you only want to allow the user to input certain numbers.

We have used selection and Boolean conditions to produce error messages if they don't.

Now we are going to use iteration (loops) to keep getting input until the data is allowable.

repl.it

Validation - The Algorithm

1. Get the input & store in a variable.
2. Start the loop, set the condition to repeat whilst the input is not the same as the desired data.
3. Output an error message.
4. Get the input again, store in the same variable as before.
5. End the loop
6. Output a success message

Validation with text - how to code

1. Get the input.

2. Start a while loop with conditions that check for **un-desirable** input. The loop should keep running while the input is NOT what you want.

```
password = "pa55w0rD"
userPW = input("Enter your password")

while userPW != password:
    userPW = input("Password incorrect, try again")

print("Password accepted")
```

3. Get the input AGAIN INSIDE THE LOOP.

4. Success message once the loop has ended. It will only display this once the loop has stopped.

Validation with a range - how to code

Using iteration will allow you to make the user try again if the data entered is not allowable.

1. Get the input.

```
num1 = input("Enter a number between 1 and 10")



while num1 < 1 or num1 > 10:
      Num1 = input("Number not in range, try
   again please")

print("Thank you")
```

2. Start a while loop with conditions that check for **undesirable** input. The loop should keep running while the input is NOT what you want.

3. Success message once the loop has ended. It will only display this once the loop has stopped.

MrAColley)

Task - Predict & Run

```
1   # Task - Predict Run
2
3   # Add comments to the code to explain how it will work.
4   # Run the code to check your predictions.
5
6
7   #Example 1
8
9   correctUserName = "Dave"
10
11  userName = input.lower(("Please enter your username"))
12
13  while userName != correctUserName:
14    userName = input("Username incorrect, please try again.")
15
16  print("Username accepted.")
17
18  # Example 2
19
20  num1 = input("Enter a number between 1 and 10")
21
22  while num1 < 1 or num1 > 10:
23    num1 = input("Invalid number, please try again")
24
25  print("Input accepted.")
```

repl.it

Resources created by Andy Colley (@MrAColley)

Task - Investigate

```
1   # Task - Investigate 1
2
3   # Answer the questions about the code
4
5   num1 = input("Enter a number between 50 and 100")
6
7   while num1 < 50 or num1 > 100:
8
9     if num1 < 50:
10     print("Invalid number, too small, try again.")
11
12    num1 = input("Enter a number between 50 and 100")
13
14
15  # Where is the iteration in the code?
16
17  # How many conditions are there in the code?  What are they?
18
19  # Where is the nesting in the code?
20
21  # Why are lines 10 and 12 indented?
22
23  # Why is line 10 indented twice?
24
25  # What would be the impact of swapping the 'or' on line 7 for an 'and'?
26
```

repl.it

Resources created by Andy Colley (@MrAColley)

Task - Modify

```
28  # Task - Modify
29
30  # Copy the code and adapt it so that:
31
32  # It asks the user to enter a the number of the month they were born (eg input 1 for
    January.)
33
34  # It validates the input against a sensible range and gives the user a chance to try
    again.
35
36  # It outputs a suitable error message if the user inputs a number that is too large.
37
38  # It outputs a suitable error message if the user inputs a number that is too small.
39
```

repl.it

Task - Make 1

```
1   # Task - Make 1
2
3   # Write a program that:
4
5   # Asks the user to choose a new password and input it twice.
6   # Validates the inputs and loops until they match
7   # Outputs a success message when they do match.
8
```

repl.it

Task - Make 2

```
1   # Task - Make 2
2
3   # Write a program that:
4
5   # Asks the user to choose a new password and input it twice.
6   # Validates each input so that the length has to be at least 8 characters.
7   # Validates the inputs to make ssure that they match.
8   # Outputs a success message when they do match.
9
```

repl.it