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Notebook: Computers and Programming I

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Author: Anonymous

- We often times have to write codes that performs the same task multiple times
 - This makes programming:
 - large
 - time consuming
- Repetition Structure
 - Makes computer repeated cose as necessary
- While Loop
 - While condition is true, do something
 - Two parts:
 - Condition Tested for true of false value
 - Statements repeated as long as statement is true
 - `x = 0`
 - `while x < 10:`
 - `print("Beckford")`
 - `x = x+1`
- In order for a look to stop executing, something has to happen inside the loop to make the condition false
- Iteration
 - one execution of the body of a look
- While Loop is know as a pretest loop
 - Tests conditions before performing an iteration
 - Will never execute if conditon is false to start with
 - Requires performing some steps in prior loop
- Algorithm For In Class Activity
 - `temp = float(input("Enter the current temperature of the chemical substance:"))`
 -
 - `while temp > 102.5:`
 - `print("Please turn down thermostat, wait five minutes and check again")`
 - `temp = float(input("Enter the current temperature of the chemical substance:"))`
 -
 - `print("You temperature is okay. Check again in 15 minutes")`
- Infinite Loop
 - Loops must always contain within themselves a way to terminate
 - Something inside a while loop must eventually be false to stop
- The For Loop or Count Control Loop:
 - iterates a specific numbers of times
 - Use a for statement to write count controlled loop
 - Designed to work with sequence of data items
 - Iterates once for each item in the sequence.
 - Target Variable
 - The variable which is the target of the assignment at the beginning of each iteration

- The range process simplifies the process of writing a for loop
 - range returns an iterable object
 - Iterable
 - contains a sequence of values that can be iterated over.
- Range Characteristics
 - One Argument: Used as ending limit
 - Two Arguments: Starting value and ending limit
 - Three Arguments: Third argument is a step value
- `print("Display numbers all even numbers from 1 to 100")`
- `for num in range(2,101,2):`
 - `print(num)`
- Purpose of a target variable is to reference each item in a sequence as the loop iterates
- Target variable can be used in calculations or tasks in the body of the loop
- Sometimes the programmer does not know exactly how many times the loop will execute
- Can receive range inputs from the user, place them in variables, and call the range function in the for clause using these variables.