while loop is used to perform a bunch of statements multiple times until a condition becomes false. This is commonly used to repeat something multiple times instead of copying code multiple times. The structure looks something like this where

while <condition>:

<statement>

...

<condition> is a placeholder for any boolean expression. e.g, i < 5, name == 'swetha', i < 5 and j > 6

<statement> could be any python code. e.g, print(name), total = i+j

e.g

i = 0 # initializes variable i to 0

while i < 2: # loop runs until i < 2

print(i) # prints the value in i every time it comes inside the loop

i = i+1 # increment i and store it in i

print("done")

Let's go through each iteration of the loop

* step 1: i = 0. Store 0 in i
* step 2: check if i < 2. It evaluates to True, so it goes inside the loop
* step 3: print the value in i, which is 0
* step 4: reads the value of i which is 0, increments it and stores it in i. So i is now 1
* step 5: check if i < 2. It evaluates to True, so it again goes inside the loop
* step 6: print the value in i, which is 1
* step 7: reads the value of i which is 1, increments it and stores it in i. So i is now 2
* step 8: check if i < 2. It evaluates to False, since 2 is not less than 2. It stops the loop.
* step 9: print "done" as that is the next line outside of the loop

Note that i is incremented in the loop. If it is not incremented, the loop condition can never evaluate to False and the loop will run forever.

Another e.g

num = 2

while num != 1024:

print(num)

num = num \* 2

Question: How many times does the above loop run? What is the Output?

from math import \*

degree = 0

while sin(radians(degree)) < 1:

print(degree)

degree = degree + 5

Try to visualize what is happening in the above loop. How many times does the loop run?