



Christopher Harrison | Content Developer Susan Ibach | Technical Evangelist Sometimes we need to perform an action more than once

- Pour a cup of coffee for each guest
- Wash the dishes until they are all clean
- Make a name card for each guest attending a party



Loop an unknown number of times



For loops allow us to execute code a fixed number of times

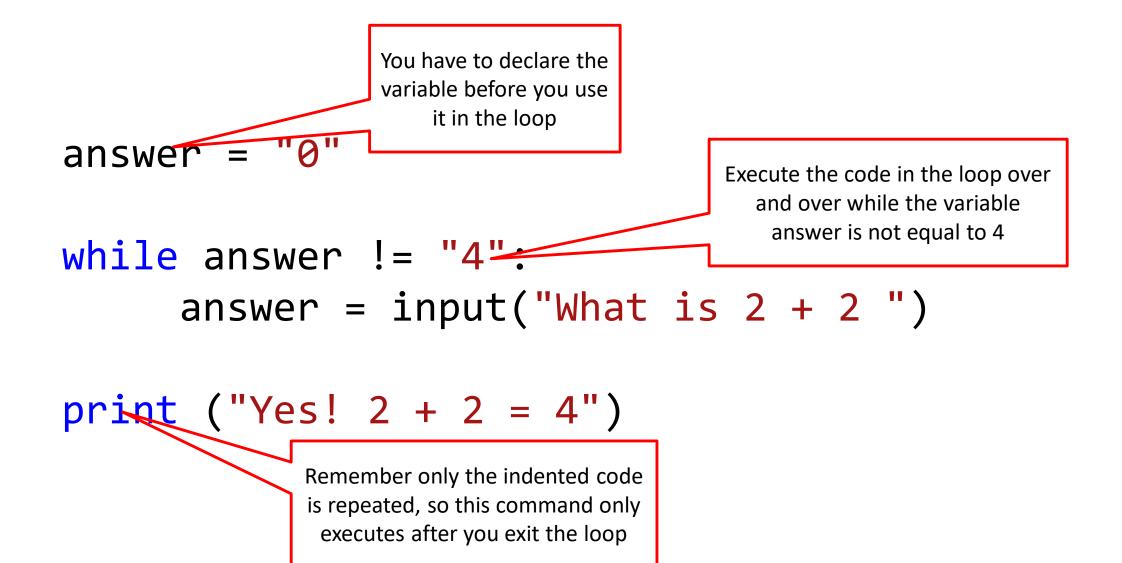
 So if we know there are twenty guests we can print twenty name cards

for steps in range(20):

What if we don't know how exactly how many times to repeat an event

- Wash the dishes until they are all clean
- Keep guessing until you get the right answer
- Read all the values in a file or in a database

While Loops allow you to execute until a particular condition is true





DEMO

While loop

Can you figure out what this code will do?

```
import turtle
counter = 0
while counter < 4:
    turtle.forward(100)
    turtle.right(90)
    counter = counter+1</pre>
```

Yes, it will draw a square

While loops can be used instead of for loops

```
import turtle
for steps in range(4):
    turtle.forward(100)
    turtle.right(90)

    turtle.right(90)
    counter = counter+1
```

• Both loops have the same end result

How many lines will this loop draw?

```
import turtle
counter = 0
while counter <= 4:
    turtle.forward(100)
    turtle.right(90)
    counter = counter+1</pre>
```

• It will actually draw 5 lines! Not 4!

How many lines will this loop draw?

```
import turtle
counter = 1
while counter < 4:
    turtle.forward(100)
    turtle.right(90)
    counter = counter+1</pre>
```

• It will draw only 3 lines! Not 4!



Looping issues



How many lines will this loop draw?

```
import turtle
counter = 0
while counter < 3:
    turtle.forward(100)
    turtle.right(90)</pre>
```

• Trick question! It will execute forever! Because the value of counter is never updated! How can the counter ever become greater than 3? This is called an endless loop and sometimes we get one by mistake.



DEMO

How to get out of an endless loop in Visual Studio

It's easier to make a mistake with a while loop than a for loop

• Use for loops whenever possible

Don't fear the while loop

- You will encounter problems where a while loop is the only way to solve a problem
- They are often used when reading data (read until no more data)

Your challenge

- Create an etch a sketch program
- Have the user enter a pen color, a line length, and an angle
- Use turtle to draw a line based on their specifications
- Let them specify new lines over and over until they enter a line length of 0.
- When the user specifies a line length of 0 stop drawing.

Congratulations

 You can manage problems which require repeating the same task and end when a specific condition occurs





©2013 Microsoft Corporation. All rights reserved. Microsoft, Windows, Office, Azure, System Center, Dynamics and other product names are or may be registered trademarks and/or trademarks in the U.S. and/or other countries. The information herein is for informational purposes only and represents the current view of Microsoft Corporation as of the date of this presentation. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information provided after the date of this presentation. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS PRESENTATION.