COMPSCI 111 / 111G

Mastering Cyberspace:
An introduction to practical computing

Programming with Python

Loops

Loops

```
while <condition>:
     statements to execute while the condition is true
```

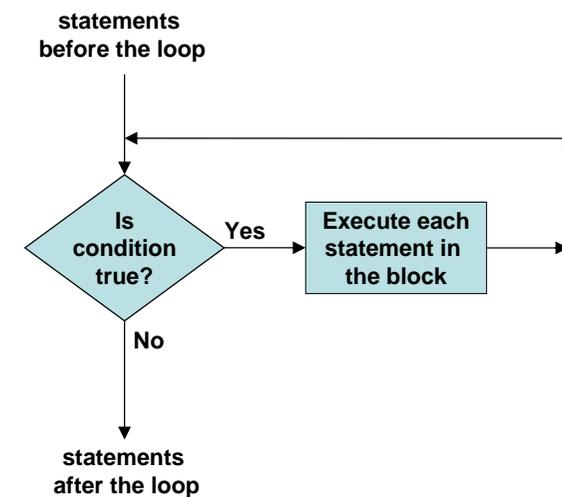### Loops are extremely common in programming

- If the condition is true, then the statements in the block are executed
- After the block of statements is executed, we return to the while keyword and check condition again
- If the condition is true, then the statements in the block are executed
- …
- The process continues until the condition is false
- When the condition is false, the statements in the block are skipped and execution continues with any statements that follow the loop

---

Revision

What is the output of the following program when the user enters the number 6 at the prompt?

```
#Author: Andrew Luxton-Reilly
#Date: 7/05/06
#Revision question

number = input("Please enter a number ")

if (number % 2 == 0):
        print "A"
        if (number < 10):
                print "B"
        else:
                print "C"
else:
        print "D"
print "E"
```

Flow Diagram

statements
before the loop

Is condition true?　Yes　Execute each statement in the block

No

statements
after the loop

Example

Keep asking the user to enter a number bigger than 0 until they enter a number bigger than 0.

```
#Author: Andrew Luxton-Reilly
#Date: 7/05/06

#Set the number to be -1 to start
number = -1

while (number <= 0):
    number = input("Please enter a positive number: ")

print "Well done"
```

Exercise

Using a loop to count

Extremely common in programming

- Loop a specified number of times
- Use the same pattern of code

```
#Loop from start to end
start = 10
end = 20

#Use a variable to keep track of the loop
count = start

while (count <= end):
    #do something
    print count, "*", count, "=", count ** 2
    #increase value of count
    count = count + 1
```

Example

Print out all the numbers between 1 and 10

- Use a variable to keep track of the numbers
- Start the loop with number = 1
- Stop the loop after the number reaches 10

```
#Author: Andrew Luxton-Reilly
#Date: 7/05/06

#Use a variable to keep track of the loop
count = 1

#Keep doing the loop until we have reached 10
while (count <= 10):
    print count
    count = count + 1
```

Exercise

Exercise