# GCSE

Practical programming skills in Python

#### **Using lists**

Topic 5





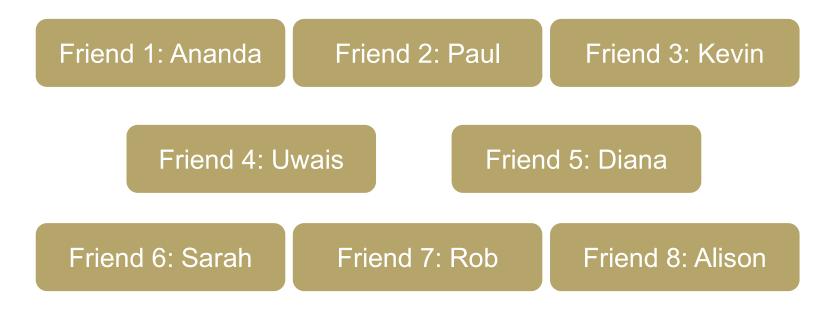
#### Objectives

- Understand why lists and arrays are useful
- Be able to read and edit data in a list
- Know how to declare and append to a list



#### Starter

 How many variables do we need to store these names?





#### Using lists Practical programming skills in Python

### Starter

- How many variables do we need?
- You could use eight variables...
  - ...or you could use just one list



#### Using lists Practical programming skills in Python

### Lists

- A list is just what it sounds like a single variable with a list of values
  - e.g. A list called friends with four elements:

friends[0] = "John"

- friends[1] = "Paul"
- friends[2] = "Fred"

friends[3] = "Ringo"





#### Lists

• Try this code:

friends = ["John","Paul","Fred","Ringo"]
print(friends)



#### Using lists Practical programming skills in Python

### Lists

- You can print an entire list: print(friends)
- Or you can print just one value: print(friends[0])
- Note that we start counting from **0**, so if there are 4 values they will be numbered 0,1, 2 and 3



# Changing a value

- As well as reading just one value, you can also change one value at a time
- Add this code:

```
print(friends)
friends[2] = "George"
print(friends)
```



# Creating a blank list

- Sometimes you might want to create an empty list and fill in the values later
- Try this code:

food = [None]\*5
print(food)
food[0] = "Pizza"
print(food)



### Worksheet 5a

• Now try the questions in Task 1



# Appending a new list element

• Try this code:

friends = ["John", "Paul", "Fred", "Ringo"]
print(friends)
friends[4] = "Stuart"
print(friends)

• You should find you get an error!



# The append() list method

• Now try this code:

```
friends = ["John", "Paul", "Fred", "Ringo"]
print(friends)
friends.append("Stuart")
print(friends)
```

• It should work! Why?



# Appending to a list

- A list is a fixed size this one has four values:
  - friends[0]
  - friends[1]
  - friends[2]
  - friends[3]
- To add an extra one you need to append (add) a new value to the end



### **Other list methods**

• city= ["P", "a", "r", "i", "d", "s"]

Method	Description
append(value)	Add a new value to the end of a list
<pre>insert(index,value)</pre>	Inserts a value at a point in the list and moves other items along one
<pre>pop(index)</pre>	Removes a particular index value from a list
remove(value)	Removes a given value from a list

- city.pop(4) removes item 4 from the list and returns the value "d"
- city.pop() without a parameter would remove and return the last item "s"



# **Reading list methods**

• What word will be printed?

```
word =["c","b","e","g","h","d"]
word[0] = "e"
word.pop(2)
word.remove("g")
word.insert(0,"z")
word.pop(3)
word.insert(3,"r")
word.pop()
word.append("a")
print(word)
```





#### Worksheet 5a

Now try Task 2





# **Stepping through lists**

Remember FOR loops?

Try this code:

for loop in range(4):
 print(loop)



# **Stepping through lists**

Try this code:

```
friends = ["John","Paul","Fred","Ringo"]
for loop in range(4):
    print(friends[loop])
```

You can use the loop counter to step through each value. First friends[0], then friends[1] and so on...



# Interrogating lists

- You can search lists line by line, or you can use a simpler shortcut
- Try this code:

```
friends = ["John", "Paul", "Fred", "Ringo"]
if "Paul" in friends:
    print("Found him")
else:
    print("Not there")
```



# Interrogating lists

- And if you know a value is in the list, you can find out where
- Try this code:

friends = ["John","Paul","Fred","Ringo"]
print(friends.index("Paul"))



### Worksheet 5b

• Now try the questions on the worksheet



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