

GCSE

Practical
programming
skills in Python

Using lists

Topic 5



PG ONLINE

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?

Friend 1: Ananda

Friend 2: Paul

Friend 3: Kevin

Friend 4: Uwais

Friend 5: Diana

Friend 6: Sarah

Friend 7: Rob

Friend 8: Alison

Starter

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

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)
```

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