GCSE

Practical
programming
skills in Python

Using lists

Topic 5

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5
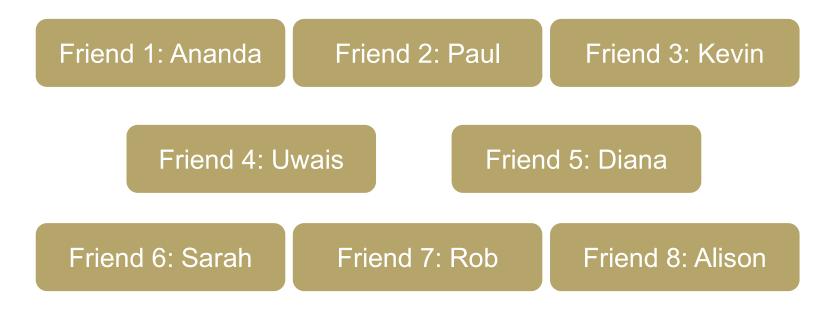
Objectives

- 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

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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)
```

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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

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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)
```

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Creating a blank list

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

- Try this code:

```python
food = [None]*5

print(food)

food[0] = "Pizza"

print(food)
```

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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:

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

- It should work! Why?

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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

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Other list methods

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

Method	Description
append(value)	Add a new value to the end of a list
insert(index,value)	Inserts a value at a point in the list and moves other items along one
pop(index)	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"

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Reading list methods

- What word will be printed?

```python
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)
```

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Worksheet 5a

- Now try **Task 2**

Stepping through lists

Remember FOR loops?

Try this code:

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

Stepping through lists

Try this code:

```python
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…

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Interrogating lists

- You can search lists line by line, or you can use a simpler shortcut

- Try this code:

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

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Interrogating lists

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

- Try this code:

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

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Worksheet 5b

- Now try the questions on the worksheet

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