Chapter 4.3: Arrays Refresh

Objectives

- **Reinforce 1D array knowledge**
- **Understand the term 2D & 3D Array**
- **Show how 2D and 3D arrays are indexed**

Key Terms

- **Array (1D, 2D, 3D)**
- **Append**
- **Index**
- **Static**
- **Dynamic**

Progression Pathways

Below you can see which skills you may be able to tick off during this block of work. Remember to open up your spreadsheet and update your personal skills log.

Computer Progression Pathways Codes

Algorithms	Programming & Development	Data & Data Representation	Hardware & Processing	Communication & Networks	Information Technology
A1	P1	D1	H1	C1	I1
A2	P2	D2	H2	C2	I2
A3	P3			C3	I3
	P4				I4
A4	P5	D3	H3	C4	I5
A5	P6	D4	H4	C5	I6
A6	P7	D5	H5		I7
A7					I8
					I9
A8	P8	D6	H6	C6	I10
A9	P9	D7	H7	C7	I11
A10	P10	D8		C8	I12
A11	P11	D9	H8	C9	I13
A12	P12	D10	H9	C10	I14:
A13	P13		H10	C11	I15
	P14				I16
A14	P15	D11	H11	C12.	I17
A15	P16	D12	H12	C13	I18
A16	P17	D13	H13	C14	I19
A17	P18	D14			
		D15			
		D16			
A18	P19	D17	H14	C15	I20
A19	P20	D18	H15	C16	I21
A20	P21	D19			I22
	P21	D20			I23
	P22				
	P23				
A21	P24	D21	H16	C17	I24
A22	P25	D22		C18	I25
A23	P26	D23		C19	I26
A24	P27				I27
A25					I28
A26	P28	D24	H17:	C20	I29
A27	P29	D25	H18		
	P30	D26	H19		

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Theory Quiz

1. What does CASTING mean?

Casting is basically converting one data type to another.

2. What does INDEX mean?

The index is the number that identifies an element of an array. Starts at 0.

3. What does STATIC ARRAY mean?

A static array is an array that has a fixed size and when it's declared, the number of items it can hold must be stated. Basically immutable like a tuple

4. WHAT does DYNAMIC ARRAY mean?

If an array is declared as a dynamic array in a programming language, then an item cannot be inserted at a particular index position as there aren't any index positions until items have already been inserted. You can use append to add items into it. Basically a dynamic array is able to be changed.

Practical (Ensure your code is fully commented)

5. Show below in Python how you would output the length of an array.

```
def q5():
  list = ["dog", "cat", "banana"]
  length = len(list)
  print(length)
q5()
```

6. Show below in Python how you would append an item to an array.

```
def q6():
  list = ["milk", "cheese", "cereal"]
  print(list)
  list.append("bread")
  print(list)
q6()
```

```
['milk', 'cheese', 'cereal']
['milk', 'cheese', 'cereal', 'bread']
```

7. Show below in Python how you would create a loop to see if an item existed in an array.

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```
def q7():
  list = [1, 17, 76, -5]
  for i in list:
    if i == 1:
      print("true")

q7()
```

```
true
```

8. Show below in Python how you would SLICE an array (output some of the items in the array).

```
# Slice list
def q8():
  list = [1, 2, 3, 4, 5, 6, 7, 8]
  splitList = list[1:5]
  print(splitList)
q8()
```

```
[2, 3, 4, 5]
```

9. Show below in Python how you would change one item for another in an array. (eg find the word Ford and replace it with Kia)

```
# Find and replace something in list
def q9():
  myArray = ["Ford", "BMW", "Mercedes", "Mitsubishi", "Suzuki"]
  myArray = [w.replace("Ford", "Kia") for w in myArray]
  print(myArray)
q9()
```

```
['Kia', 'BMW', 'Mercedes', 'Mitsubishi', 'Suzuki']
```

10.
The arrays you have been working with are called 1D or One Dimensional Arrays. You can have multidimensional arrays which are 2D or even 3D. Explain what they are and describe the difference between a 1D, 2D and 3D array. Use diagrams to show how elements in a 2D and 3D array are indexed.

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