

Year 10 Interleaved Homework 18

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This task is not about how much you can remember; it may require you to use the course website to help you answer some questions.

1. Array Questions

```
names = ["Anna", "Bobby", "Charlie", "Daisy"]
```

a. What data type is being stored in the array?

string

b. What would print(names[3]) return?

"Daisy"

c. In Python, you can treat strings like an array, meaning you can access the letters in the words like a 2D array.

What would print(names[2][4:7]) return?

"lie"

d. Write the Python code needed to output the value "Anna":

print("Anna") OR print(names[0])

e. Write the Python code needed to change the value "Bobby" to "Billy":

names[1] == "Billy"

2. Huffman Coding vs ASCII

Calculate the difference in the number of bits saved between Huffman coding and ASCII coding for the characters in the word "SUCCESS".

Character Huffman Code

S	11
U	01
C	10
E	00

Show all your working out.

$\text{len("SUCCESS")} * 7 = 49\text{bits} - \text{ASCII}$

$2 * \text{len("SUCCESS")} = 14\text{bits} - \text{Huffman}$

$49 - 14 = 35\text{bits}$

3. Conversions

Complete the following conversions, showing all your working:

a. Convert **E4** from Hexadecimal into Binary

`11100100`

b. Convert **01001010** from Binary into Denary

`64+8+2 = 74`

4. Contact Records

Figure 1: Record Structure

```
RECORD Contact
name: string
phone: string
address: string
postcode: string
favourite: Boolean
ENDRECORD
```

Figure 2: Example Record

```
Mandy = Contact("Mandy", "07123456789", "Tracyes
Road", "CM18 6JH", True)
```

a. Write the Python code needed to display Mandy's phone number:

`print(Mandy.phone)`

b. Write the Python code needed to unfavourite Mandy as a contact:

`Mandy.favourite = False`

c. Write the Python code to add a contact for Joe whose phone number is 07987654321, he lives on Fake Street with a postcode of AB12 3CD, and he is **not** a favourite contact:

`Joe = Contact("Joe", "07987654321", "Fake Street", "AB12 3CD", False)`

5. Delivery Van Program

A business has received a large number of delivery orders. Their vans can carry **30 boxes each**.

Write a Python program that calculates the total number of vans needed to transport the deliveries.

An array of the number of boxes needed for each order is already provided:

```
boxes = [30, 10, 50, 20, 30]
```

The program should:

- Calculate the total number of boxes for delivery.

- Calculate the total number of vans needed for the delivery.
- Output the total number of vans as a whole number.

Ensure to apply proper indentation, use meaningful variable names, and adhere to Python syntax in your response.

<pre>total_boxes = 0 for boxcount in boxes: total_boxes += boxcount vanCount = total_boxes // 30 if total_boxes % 30 != 0: vanCount += 1 print(vanCount)</pre>	<pre>import math totbox = 0 for bc in boxes: totbox += bc print(math.ceil(totbox/30))</pre>
<pre>total_boxes = 0 for boxcount in boxes: total_boxes += boxcount vanCount = (total_boxes+29)//30 print(vanCount)</pre>	<pre>boxtot = sum(boxes) vans = (boxtot+29) // 30 print(vans)</pre>