Year 10 Interleaved Homework 20

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.

Name: Ethan Armstrong

1. Array Questions

colours = ["Aqua", "Teal", "Crimson", "Orange"]

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

Strings

b. What would print(colours[2]) return?

Crimson

c. In Python, you can treat strings like an array. What would print(names[1][3]) return?

NameError: name 'names' is not defined

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

print(colours[2].lower())

e. Write the Python code needed to change the value **"Orange"** to **"Purple"**:

colours[3] = “Purple”

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 **"BALOON"**.

Character	**Huffman Code**
B	110
A	10
L	00
O	01
N	111

Show all your working out:

110 10 00 01 01 111

3+2+2+2+2+3 = 14

7*6=42

42-14 = 28 bits

3. Structured Programming

Using structured programming is a benefit for programmers.

Give one reason why using subroutines is beneficial:

Allow multiple people to work at the same time

4. Functions vs Procedures

State the difference between a **function** and a **procedure**:

Function returns the value to the code, procedure outputs it and cannot be used by the code later on

5. Record Data Structure

Figure 1: Record Structure

```
RECORD Employee
name: string
department: string
telExtension: int
Active: Boolean
ENDRECORD
```

Figure 2: Example Record

Amina = Employee("Amina", "Sales", 145, True)

a. Write the Python code needed to display Amina's **Name** and **Department**:

print(Amina.name, Amina.department)

b. Write the Python code needed to change Amina's **Active** status to False:

Amina.Active = False

c. Write the Python code to add a new Employee in the HR department called Liam. The HR's extension is 147:

newEmp = Employee(“Liam”, “HR”, 147, False)

6. Subroutine Practice: Library Visitors

Here is a Python program that calculates the average number of ice creams sold:

```
def icecreamsSold(days):
    print("Average customers per day")
    customers = int(input())
    sold = days * customers
    return sold
```

Using this as an example, write a subroutine to assist a library in estimating the number of visitors in a month.

The subroutine must:

1. Have the identifier trackVisitors
2. Accept the number of days the library was open in the last month as a parameter
3. Prompt the user to input the average number of visitors per day

4. Calculate the estimated visitors by multiplying the days open by average visitors
5. Return the estimated number of visitors

```
def trackVisitors(MonthlyOpenDays):
    daily = int(input())
    est = daily * MonthlyOpenDays
    return est
```