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Year 10 Interleaved Homework 14

1. Python Functions

Within our Python unit, we have learned about some functions. Here is a quick recap:

- **ord()** returns the ASCII position of the letter. For example, ord("A") would return 65.
- **chr()** returns the letter in that position. For example, chr(65) would return "A".
- **len()** returns the number of characters in the string. For example, len("hello") will return 5 as there are five letters in the word.

Read this Python code and answer the following questions:

```
1. make = "FORD"
2. model = "MUSTANG"
3. x = ord(make[0])
4. y = x + len(model)
5. z = chr(y)
6.
7. print(x, y, z)
```

a. What is the value of x?

70

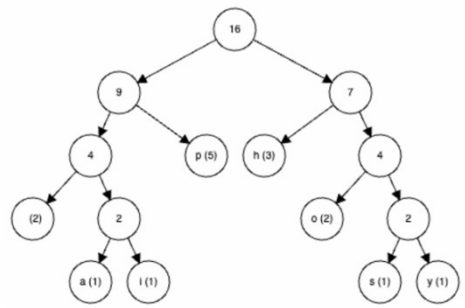
b. What would len(model) return?

77

c. What would the output of the code be?

70 77 M

2. Huffman Encoding



Here is a Huffman tree for the phra

"happy hippos hop"

a. Complete the table to encode some of the letters:

Letter	Huffman Encoding
a	0011 Whoever made this sheet is wrong its 0010
i	0011
p	01
h	10
o	110
s	1110
y	1111

b. Write the Huffman encoding for the word **"soapy"**:

1110 110 0010 01 1111

c. Calculate the number of bits saved for storing the word "soapy" in Huffman compared to ASCII:

5*7 = 35 35-17 = 18

3. Random Letter Selection in Python

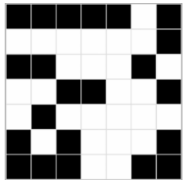
Complete the Python program that should:

- Generate a random number between 0 and the length of the word entered by the user.
- Find the letter in that position of the word.
- Output the randomly selected letter.

You will need to use the Python function random.randrange(a, b), which generates a random integer in the range a to b, starting at a but finishing one before b.

```
1. import random
2. word = input("Enter a word\n")
3. totalCharacters = len(word)
4. position = random.randrange(totalCharacters)
5. randomLetter = word[position]
6. print(randomLetter)
```

4. Image Encoding & Compression



Here is a 7 pixel by 7 pixel image:

a. Using 1 for black and 0 for white, write the binary code for the first line of this image:

1111101

b. Compress the first line using **Run Length Encoding (RLE)**:

(5, 1) (1, 0) (1,1)

5. Name Scoring Program

Write a Python program to calculate the score of someone's name.

Your program must:

- Get the user to input a name.
- Calculate the score of the name by multiplying the length of their name by 10.

- If the name starts with a vowel, an additional 50 points are added to their score.
- Output the final score.

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

```
1. name = input("enter name")
2. score = len(name) * 10
3. print(score + 50 if name[0].lower() in "aeiou" else score)
```