CS 126L

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Lab 4 - Banners

1. Problem statement

We needed to implement a function called "print_banner" that takes a string input for what to print and a second input to signify if the banner is horizontal or vertical. We used a dictionary to store the characters needed to print the dictionary. The banner has to be a minimum height of 4 characters.

2. Planning

Step 1.

Requirements:

1. Create a function with 2 parameters, one that takes in a character list of some type and the other one instructs the function how to print the return function (vertical or horizontal).
2. The banner must be at least 4 characters' high.

Assumptions:

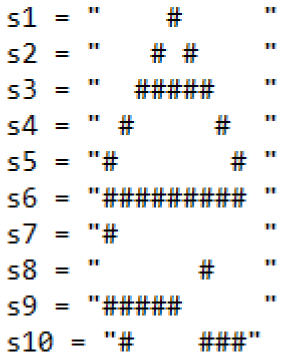
1. The input is not user defined, we inputted the 'string' by calling the function inside the code.
2. The inputted string will be written in English.

Constraints:

1. The banner needed to be at least 4 characters tall. We used a banner that was 5 characters tall.
2. The code must be pep8 compliant.

Step 2 - Pseudo code:

1. Design the characters to be used in the banner, We decided to use the '#' as the building block character for our Banner. We created the entire alphabet using the '#' character, each letter was 5 characters high and 5 characters wide.
2. Use a dictionary, let_dict = { } to store all the data, and the keys for each value would be the respective letter e.g {'a' :[ ],[ ], [ ], [ ],[]}…etc
3. We created a shorthand way to represent the characters to be used in the banners, so that we could create the dictionary faster and with less errors, so we could represent 'a' by calling on the variables s1,s2, s3, s4 ,s5 that represented a set of strings.
   "a": [s1, s2, s3, s4, s5],



```
s1 = "    #     "
s2 = "   # #    "
s3 = "  #####   "
s4 = " #     #  "
s5 = "#       # "
s6 = "######### "
s7 = "#         "
s8 = "      #   "
s9 = "#####     "
s10 = "#    ###"
```

4. To control the way the output is printed we will use conditional statements, if “vertical” then do this, elif “horizontal”, then do this.
5. Inside each conditional statement create 2 nested for loops to iterate through all the elements, for i in range(5), for j in range(5), range is 5 as this is the length and width of the list.
6. Vertical loop – To print vertically we iterate through every element of each letter. The outside loops through value of the ‘key’ and the inside loops through the value of the ‘value’. The code below shows the elements which the dictionary loops through each time.

   x = let_dict['a'][0] ,we will print this line out
   x = let_dict['a'][1] , we will print this line out
   x = let_dict['a'][2] , we will print this line out

7. Horizontal loop – to print horizontal the outside loops through value of the ‘value’ and the inside loops through the value of the ‘key’ on each iteration. We cannot print on each iteration as we want to print the entire first element of every letter on the same line. So we store the values of each iteration in a string and print the string on completion of the inside loop.
   We create store_value = ‘ ‘ outside the loop
   x = let_dict['a'][0] , we will store this value in ‘store_value’
   x = let_dict['b'][0] , we will store this value in ‘store_value’
   x = let_dict['c'][0] , we will store this value in ‘store_value’
   x = let_dict['d'][0] , we will store this value in ‘store_value’
   x = let_dict['e'][0] , we will store this value in ‘store_value’

We will now print ‘store_value’. We also need to empty ‘store_value’ after each iteration, so store_value = ‘ ‘ inside the inside loop

3. Implementation

When we called the function we inputted every letter of the alphabet to make sure that it printed out each letter legibility. We also tested the position parameter, to check that the banner was printed both horizontal and vertical.

4. Reflection

Refactor

I believe that I could print the banner both horizontally and vertically using one nested ‘for’ loop instead of 2. By using the end= ‘ ‘ in the print function. The default setting for the print() function is \n. By using the print(‘something’, end= ‘ ‘), we could override the default all contents would be printed horizontally. We would still need a conditional statement to control this.

Reflection

We achieved the objectives of the lab and successfully printed both vertically and horizontally in banner form. I don’t know it the shorthand method we created saved us much time. It is possible that if the project scope was bigger it would have saved us time, but in this project the time savings were negligible. It did remove clutter from the code and make it more readable.