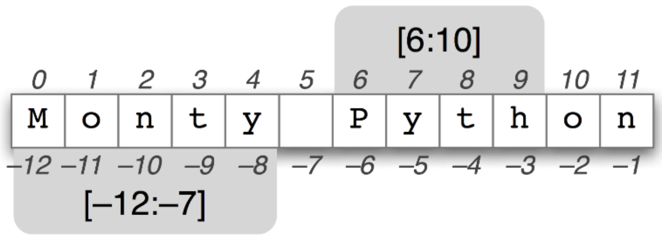
Slicing Exercises



Warm-up Excercises:

1. Create program that asks the user for a string of any length and then prints out the first 3 characters of the string and then the last 3 characters of the string.

2. Create a program that asks the user to create a **list** of words that is at least 7 words long and then prints out the following words in the following order:

   1. Last 2 words of the list
   2. The first 3 words of the list
   3.The fourth word of the list.

3. Create a program that asks the user for a **list of numbers** and then reverses it. You can't use the `.reversed()` method. **You must do it with slicing**…important!...look it up if you have to…easy!

Slice and dice:

4. Use the range method to create a list of number from 1 to 100 and then use slicing to print out the numbers from100 back to 50 but only every second number example: 100,98,96,94,9,…..

5. Use the range method to create a list of number from 1 to 100 and then use slicing to print out the numbers from 20 to 80 but only every 4th letter example: 20,24,28,32,36,40,……

Strip Method:

6. Create two strings:

```
s1 = "   Hey buddy, what's up?  "    # spaces are part of string!
s2 = "         Not much Bro!     "
```

   Create a program that will remove the any whitespace at the beginning or the end of each string. Then add them together but include the two spaces before the `N in s2`)

   Final product: `Hey buddy, what's up?  Not much Bro!`

Hint: Use the **`.strip()`** method bro!... and then concatenate the stings.

7. Create a program that:
   a) takes a list of high scores (in a video game) – input from a user.
   b) sorts the list highest to lowest using the `sort()` method
   c) and prints the top three scores. Must use slicing.

8. The next iteration of Mario Kart will feature an extra-infuriating new item, the *Purple Shell*. When used, it warps the last place racer into first place and the first place racer into last place. Create a program that has a user enter the name of 3 (or more) Mario Kart players in order of who is leading the race. Then swaps the first place and last place names and reprint the list. (use slicing)

9. We're using lists to record people who attended a cool grad party and what order they arrived in. For example, the following list represents a party with 7 guests, in which Adela showed up first and Ford was the last to arrive:

   ```
   party_attendees = ['Adela', 'Fleda', 'Owen', 'May', 'Mona', 'Gilbert', 'Ford']
   ```

   A guest is considered 'fashionably late' if they arrived **after at least half of the party's guests**. However**, they must not be the very last guest** (that's taking it too far bro!). In the above example, Mona and Gilbert are the only guests who were **fashionably late**.

   Create a **function** which takes in two arguments:
   a) a list of party attendees (more than 5)
   b) the name of one of the attendees

   Have the function output if the attendee selected in the list is:
   a) **cool** (they arrived on time)
   b) **super cool** (they arrived **fashionably late**)
   c) **not cool** (they were the last person to arrive)

10. Write a **function** that accepts two **arguments**:
    a) a list called: (list1)
    b) and a positive integer called: (chop)

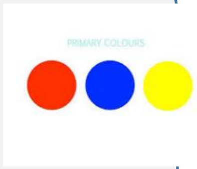
    the function will divides list1 into new lists of lengths of "chop" and puts them into a new list called: (list2)….creating a "*list of lists*". For example,

    ```
    [1,2,3,4,5,6,7,8], 4 => [[1,2,3,4], [5,6,7,8]]
    [1,2,3,4,5,6,7,8], 3 => [[1,2,3], [4,5,6], [7,8]]
    [1,2,3,4], 1         =>  [[1],[2],[3],[4]]
    ```

Color Coded Used Car Lot Game!

11. For this project you may choose to work in pairs or a group and divide up the task into smaller functions then reassemble them. You can also work on your own.

Crazy Jim at Crazy Jim's Used Car Lot likes to have his car's displayed in specific sections (organized by color). After a day of customers test driving his cars they are always out of order and that drives Jim….well….**Crazy!**



Create a game that asks a user to sort a group of colors (as fast as they can).

The car's can simply be randomly generated list of colors that ***only*** include:
3 – red (cars), 3- yellow(cars), and **4 – blues(cars) (the order will be random).**

```
[‘red’,‘yellow’,’blue’,’blue’,’blue’,’red’blue’,’yellow,’yellow’,’red’]
```

You may also show the list graphically if you wish (using turtle or other methods)

Now remember, the game is for the user to sort the list as **fast as they can**! So you will have to create some sort of timer.

The new sorted list **must** have: all the **reds first**, then the **blue's**, then the **yellow's** Users will select sections of the list and place them in a new position until the list is sorted. Please use slicing for this! Here is an example

Example:

```
a) Start of game: displayed using turtle graphics or just a list as shown
   below:

[‘red’,‘yellow’,’blue’,’blue’,’blue’,’red’,’blue’,’yellow,’red’,’red’]

b) Computer: Go!...what section do you want to move?!

c) User:   9-10

d) Move where?

e) User: 2

f) Computer: Your new list is now:

[‘red’,‘red,‘red’,‘yellow’,’blue’,’blue’,’blue’,’red’blue’,’yellow,’]

Computer: Go!...what section do you want to move now?!
```

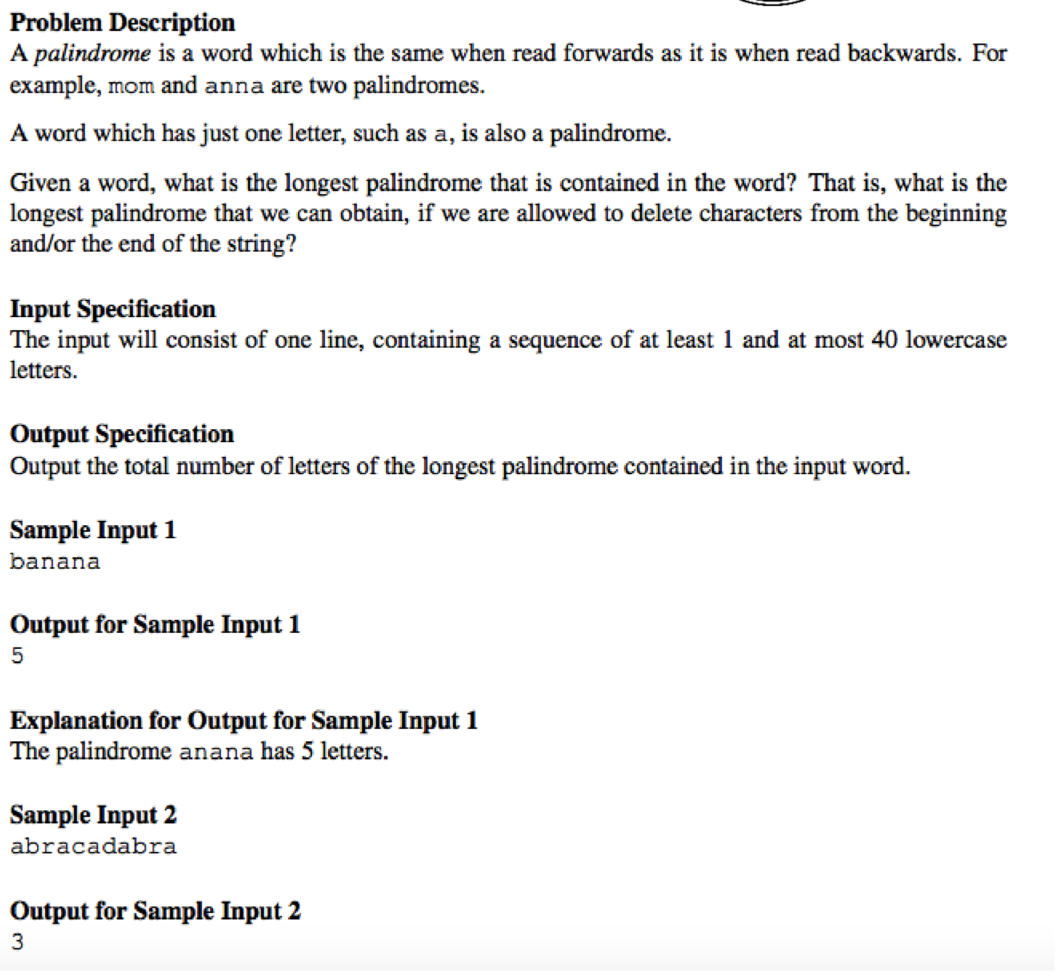
Note: the "`move where?`" position they pick will place the **first element of their selection** in that position, then the rest of the list will be shifted to the right. (See Bonus activity on next page)!

Bonus for Question #11

In reality, the number of cars that Jim has to organise at the end of the day can decrease (from 10)…this is when he sells a car. For bonus you can modify your program so that: the randomly generated list at the beginning of the game may be missing 1 or more colored "cars". In this case the max number of cars *sold* would be 4.

12. You can try this in partners too if you wish:

University of Waterloo Contest problem:



Problem Description
A *palindrome* is a word which is the same when read forwards as it is when read backwards. For example, `mom` and `anna` are two palindromes.

A word which has just one letter, such as `a`, is also a palindrome.

Given a word, what is the longest palindrome that is contained in the word? That is, what is the longest palindrome that we can obtain, if we are allowed to delete characters from the beginning and/or the end of the string?

Input Specification
The input will consist of one line, containing a sequence of at least 1 and at most 40 lowercase letters.

Output Specification
Output the total number of letters of the longest palindrome contained in the input word.

Sample Input 1

```
banana
```

Output for Sample Input 1

```
5
```

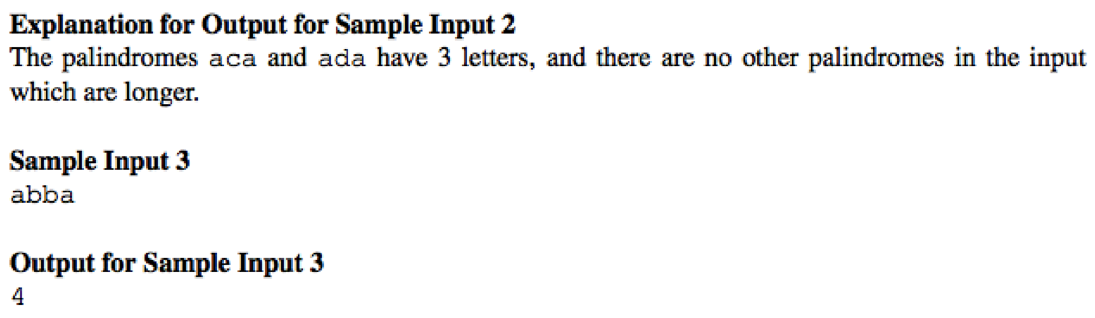
Explanation for Output for Sample Input 1
The palindrome `anana` has 5 letters.

Sample Input 2

```
abracadabra
```

Output for Sample Input 2

```
3
```



Explanation for Output for Sample Input 2
The palindromes `aca` and `ada` have 3 letters, and there are no other palindromes in the input which are longer.

Sample Input 3

```
abba
```

Output for Sample Input 3

```
4
```