

1. Given the following list:

```
L = ["blue", "green", "indigo", "mauve", "orange", "red", "violet",  
"yellow"]
```

(a) How many steps does it take to search for the value "orange" in the list using linear search? **Show your work.**

1. Compare against "blue" (False, continue to next item in list)
2. Compare against "green" (False, continue to next item in list)
3. Compare against "indigo" (False, continue to next item in list)
4. Compare against "mauve" (False, continue to next item in list)
5. Compare against "orange" (True, found)

(b) How many steps does it take to search for the value "orange" in the list using binary search? **Show your work.**

1. Look at halfway point  
("mauve")
  - a. Check if equal  
(False)
  - b. Check if it is  
greater/less than  
"mauve" (greater)
2. Look at halfway point of  
"orange" to "yellow"  
("red")
  - a. Check if equal  
(False)
  - b. Check if it is  
greater/less than  
"red" (less)
3. Orange is found (only  
remaining item)

- (c) Show the values for `low`, `high`, and `mid` for each comparison step in searching for the color "violet" in the list using binary search.

Step number	Low value, index	High value, index	Mid value, index
1	Blue, 0	Yellow, 7	Mauve, 3
2	Orange, 4	Yellow, 7	Red, 5
3	Violet, 6	Yellow, 7	voilet (found), 6