Using the Binary Search Algorithm and trace table examples at the end of this document, complete the trace tables below for the Color Array. Upload this document to github and submit the link to your repository to the dropbox.

1st search: violet

First	Last	Middle	Comparison
aqua [0]	yellow[10]	indigo[5]	violet[9]>indigo[5]
lavender[6]	yellow[10]	red[8]	violet[9]>red[8]
violet[9]	yellow[10]	violet[9]	violet[9]=violet[9]
			return: True

2nd search: green

First	Last	Middle	Comparison
aqua [0]	yellow[10]	indigo[5]	green[4]<indigo[5]
aqua[0]	green[4]	chartreuse[2]	green[4]>chartreuse[2]
dark brown[3]	green[4]	dark brown[3]	green[4]>dark brown[3]
green[4]	green[4]	green[4]	green[4]=green[4]
			return: True

3rd search: yellow

First	Last	Middle	Comparison
aqua [0]	yellow[10]	indigo[5]	yellow[10]>indigo[5]
lavender[6]	yellow[10]	red[8]	yellow[10]>red[8]
violet[9]	yellow[10]	violet[9]	yellow[10]>violet[9]
yellow[10]	yellow[10]	yellow[10]	yellow[10]=yellow[10]
			return: True

Color array:

aqua	[0]
brown	[1]
chartreuse	[2]
dark brown	[3]
green	[4]
indigo	[5]
lavender	[6]
magenta	[7]
red	[8]
violet	[9]
yellow	[10]

Binary Search

```
Set first to 0
Set last to length-1
Set found to FALSE
WHILE (first <= last AND NOT found)
    Set middle to (first + last)/ 2
    IF (item equals data[middle]))
        Set found to TRUE
    ELSE
        IF (item < data[middle])
            Set last to middle – 1
    ELSE
        Set first to middle + 1
RETURN found
```

Above: Binary Search Algorithm

Binary Search

Length
11

Items	
ant	[0]
cat	[1]
chicken	[2]
cow	[3]
deer	[4]
dog	[5]
fish	[6]
goat	[7]
horse	[8]
rat	[9]
snake	[10]
. . .	

FIGURE 7.9 Binary search example

Searching for *cat*

First	Last	Middle	Comparison	
0	10	5	*cat* < *dog*	
0	4	2	*cat* < *chicken*	
0	1	0	*cat* > *ant*	
1	1	1	*cat* = *cat*	Return: true

Searching for *fish*

First	Last	Middle	Comparison	
0	10	5	*fish* > *dog*	
6	10	8	*fish* < *horse*	
6	7	6	*fish* = *fish*	Return: true

Searching for *zebra*

First	Last	Middle	Comparison	
0	10	5	*zebra* > *dog*	
6	10	8	*zebra* > *horse*	
9	10	9	*zebra* > *rat*	
10	10	10	*zebra* > *snake*	
11	10		*first* > *last*	Return: false

FIGURE 7.10 Trace of the binary search