

To print from the command-line: `lpr worksheet.pdf`

pseudo-code algorithm for binary search:

```
-----  
set low = lowest-possible index  
set high = highest possible index
```

```
LOOP while low <= high:  
  1. set mid = (low + high)//2  
  2. if item is equal to item at mid:  
     found! return mid  
     elif item is less than item at mid:  
         set high = (mid - 1)  
     else:  
         set low = (mid + 1)
```

If we made it out of the loop, we didn't find it so return -1

```
-----  
x = 99  
L = [-20, -12, -4, 1, 7, 44, 45, 46, 58, 67, 99, 145]  
index: 0  1  2  3  4  5  6  7  8  9  10  11
```

```
low  mid  high  
-----
```

1. For each value of x and L shown on the worksheet, trace the values of low, mid and high (to the right) assuming you called the function

```
result = binary_search(x, L).
```

2. Show the value of result after each search

```
x = -10  
L = [-20, -12, -4, 1, 7, 44, 45, 46, 58, 67, 99, 145]  
index: 0  1  2  3  4  5  6  7  8  9  10  11
```

```
low  mid  high  
-----
```

```
x = "Sukrit"
L = ['Andy', 'Joshua', 'Kevin', 'Lauri', 'Lila', 'Lisa', 'Rich', 'Sukrit', 'Tia', 'Vasanta', 'Zach']
index: 0      1      2      3      4      5      6      7      8      9      10

                                         low  mid  high
                                         -----
```

```
x = "Jeff"
L = ['Andy', 'Joshua', 'Kevin', 'Lauri', 'Lila', 'Lisa', 'Rich', 'Sukrit', 'Tia', 'Vasanta', 'Zach']
index: 0      1      2      3      4      5      6      7      8      9      10

                                         low  mid  high
                                         -----
```