

pseudo-code algorithm for binary search:

```
-----  
set low = lowest-possible index  
set high = highest possible index  
LOOP:  
    if low is ever greater than high, item not here  
        (done, return -1 to indicate not found)  
    calculate middle index = (low + high)/2  
    if item is at middle index (done, found it! return middle index)  
    elif item is < middle item,  
        set high to middle index - 1  
    elif item is > middle item,  
        set low to middle index + 1
```

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

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

```
x = "Amanda"
L = ["Andrew", "Ben", "Chris", "Jocelyn", "Joshua", "Kevin", "Lauri", "Lila", "Lisa", "Tia", "Zach"]
index: 0      1      2      3      4      5      6      7      8      9      10

                                     low  high  mid
                                     -----
```

```
x = "Lisa"
L = ["Andrew", "Ben", "Chris", "Jocelyn", "Joshua", "Kevin", "Lauri", "Lila", "Lisa", "Tia", "Zach"]
index: 0      1      2      3      4      5      6      7      8      9      10

                                     low  high  mid
                                     -----
```