**Binary Search Algorithm**

1. **Write descriptive comments above each line of code. Binary Search algorithm requires nums[] array to be sorted. The “check” variable is the target to be found in the array nums[].**

int hi = nums.length - 1; //Make high equal to length of array

int lo = 0, guess = 0; //Make low and guess equal to zero

while(hi >= lo){ //While the high is still greater than low run

guess = lo + ((hi - lo) / 2); //Guess a random index

if(nums[guess] > check){ //Check if the number guessed is //greater than the number being searched for

hi = guess - 1; //If it is, make the new high //equal guess -1

}else if(nums[guess] < check){ //Check if the number //guessed is less than the number being searched for

lo = guess + 1; //If it is, make the new low guess //+1

}else{

return guess; //If this runs the index is found

}

//PASS LINE

}

return -1;

1. **Run the search on the list of numbers and write the value of “guess”, “lo” and “hi” at each pass**

int nums [] = {6, 11, 22, 23, 25, 51, 56, 64, 84, 85, 96};

check = 25;

|  |  |  |
| --- | --- | --- |
| guess | lo | hi |
| 0 | 0 | 10 |
| 5 2 3 4 | 3 4 | 4 |
|  |  |  |
|  |  |  |

|  |  |
| --- | --- |
| hi | 10 7 |
| lo | 0 6 |
| guess | 0 5 8 6 |
| check | 56 |

nums

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 11 | 22 | 23 | 25 | 51 | 56 | 64 | 84 | 85 | 96 |