1. Explain Binary search algorithm

We first need to find the beginning and the end of our search field  
The beginning is the start of the first index of the array   
The end of the search field is going to be the last index of the array  
  
We then enter a while loop. The while loop is going to execute until the initial start index is lower than the end index.  
First thing in the while loop, and this will repeat ever time the loop is executed, we will calculate the middle of the search field. The middle is calculated by finding the sum of the start and the end and dividing it by 2. The output is the middle of the array.   
  
Next we evaluate the number we are looking for with the number that sits in on the middle index in the array. If the number we are looking for is bigger than the number on the middle index we move the start position of to the next available position after the middle. This means that we are shortening the range of our search. All the other numbers to the left of the middle index are lower than the number we are looking for and there is no need to search for our number there.   
But if the number on the middle index is not bigger than the number we are looking for, we move the end index to the middle. This means that the number we are looking for is to the left of the middle index and we are again discarding half of the array.  
  
We then repeat these steps until we finally find the number. Eventually the end index and the start index will point to the same index and this will force the while loop condition to be false and will exit out of the loop.

As a final step we are checking to see if the number we are looking for is equal to the number of the start index. (We can also check for equality with the number in index End, they are both pointing to the same index). If the number and the number on index i are equal then we output the value of, otherwise we don’t