Asif Bux
Lab 9

Question 2:

```
int binarySearch(int[] arr, int key) {
        int lo = 0, mid, hi = arr.length-1;    // Complexity = 3
        while (lo <= hi) {                     // Complexity = logn + 1
        mid = (lo + hi)/2;                     // Complexity = 3*logn
        if (key < arr[mid])                    // Complexity = 2*logn
                hi = mid - 1;                      // Complexity = 2*logn
        else if (arr[mid] < key)               // Complexity = 2*logn
                lo = mid + 1;                      // Complexity = 2*logn
        else
                return mid;                  // success: return the index of // Not counted
         } // the cell occupied by key;              // Complexity = 1
                  return -1;                     // failure: key is not in the array; // Not counted
        }
```

Final Complexity:

= 3 + (logn + 1)+ 3logn + 2logn + 2logn + 2logn + 1

= **10logn + 5**