

Lab 9 · Binary Search*Lecturer: Philippos Mordohai, Shudong Hao**Date: November 2*

1 Objective

- Implement binary search and handle all possible outcomes.

2 Binary Search

Integrate **your** selection sort code from Programming Project 1 as a function to sort an input array of double words. If your selection sort code does not work, use a pre-sorted array for the following steps. There will be a 10% penalty in this case.

Your code should accept a double word query from the keyboard using `scanf`.

Then, binary search should be used to find the query in the array. Use `gdb` to confirm that your algorithm works correctly, when:

- (1) the query is not in the array,
- (2) the query is the first element of the array,
- (3) the query is the last element of the array,
- (4) the query is some position in the array.

3 Requirements

- (1) The array of doublewords and its length should be in the **data** segment of your program.
- (2) Your program must print whether the query was found or not, and the index of the corresponding element in the sorted array, if the query was found.

4 What to Submit

Your source code in a `.s` file and a pdf file including screenshots of `gdb` for each of the four cases above, along with a description of what happens in each case.