CS264 Spring 2018 Project 4
Total points: 100

(no late submissions accepted for any reason)

Submission Instruction:
You must run the assembly program using the SPIM simulator. Please zip the following files:

The assembly program(s) (using file extension .asm) and log files showing the state of SPIM at program completion and the console. Make sure to include the template file contents at the top of your code,

Readme.txt (you should explain how to run your program.)

You need to provide log files. After your program terminates, click on [File->Save log File] and select all of the checkboxes. This will save your console output, registers, and memory on one log file.

You can work in teams if you'd like. The team can be no more than two people (no exceptions). Each team member must equally contribute and fully understand the work.

Only one team member should submit the lab. Be sure that both team member's names are in the README.

Submit your **zip** file via Blackboard.

Project Specifications:
Use the program that you had written in project 3, Be sure it works properly,
Write a subroutine that performs a binary search on the data entered by the user.

Run these 4 experiments on your code. The experiment details are:

Input 8 integers. Do not enter them in order, they should be put in order by the stack-control routine from project 3. You must save a separate log file for experiment.

1. search for the smallest integer that you had entered
2. search for the largest integer that you had entered
3. search for an integer near the median of the list entered
4. search for an integer that doesn't exist

Note: These searches can be done in separate runs, you do not have to write code to run all four tests in a single run.

- Your main routine must read from input the value to be searched and pass value to the search subroutine using an $a register. Of course this will happen after inputting the 8 ints.
- The search subroutine should return 0 if the integer was not found and 1 if it was This value must be returned on $v0 register.

- The main method only needs to report whether or not the integer was found based on the return value of the subroutine.
- Remember, your *search* subroutine will need to store data on the stack before it calls itself recursively

Pseudo code for binary Search:

val is the int to be searched
low is the lowest index of the portion of the array (stack) to be searched
high is the highest index of the portion of the array to be searched

```
int binSearchRec(int val, uint &s, int low, int high) {
  if (low > high)
       return 0;

  int mid = (low + high) / 2;

   if (s[mid] == val)
       return 1;

   else if (s[mid] < val)
      return binSearchRec(val, s, mid + 1, high);

   else
      return binSearchRec(val, s, low, mid - 1);
}
```