

## EC362 Lab #2

### MIPS Programming

The purpose of this lab is to give you experience writing a complete MIPS program that includes I/O, function calls and returns (with stack manipulation), and several common coding elements (loops, conditional statements, arithmetic, etc).

**Lab part 1:** write two MIPS functions, one for each of the following C functions (i.e. one MIPS function for each C function):

```
int find(int A[], int n, int x, int p) { // find the first occurrence of x in A[p..n-1]
    int i;
    for (i = p; i < n; i++) {
        if (A[i] == x) return i; // x is found in position i
    }
    return -1; // only if x is not found
}
```

```
int count(int A[], int n, int x) { // count the number of times x appears in A
    int i, counter = 0;
    for (i = 0; i < n; i++) {
        if (A[i] == x) counter++; // x is found, so increment counter
    }
    return counter;
}
```

**Lab part 2:** write a main program in MIPS that does the following:

- 1) Statically allocates an array A of length 20 (all integers). Fill the array with the following values (in this order) {2,4,6,8,10,1,3,5,7,9,5,4,3,2,1,1,2,3,4,5}.
- 2) Prompts for an integer x to be input via the keyboard.
- 3) Makes the following function calls and prints the answer to each one immediately following the return from the function (print "not found" for any x value that isn't found in A):
  - a. count(A,20,x);
  - b. find(A,20,x,0);
  - c. find(A,20,x,3);
  - d. find(A,20,x,8);
  - e. find(A,20,x,15);
- 4) Exits properly.

Test your program for the following x values: 2, 5, 7, 11