

# ECE270 Final Exam

April 24, 1998

Closed Book

Honor code in effect

1. (50) Write a program that will read in a series of character strings from the command line. Each string is to be converted to lower case and printed out. Please use the name prog1.c for this file.

2. (50) Write a function that will calculate the roots of the quadratic and return the answer in a two-element array. If complex roots are found, indicate this and stop the program. The function prototype is:

```
void quad_root(double a, double b, double c, double roots[]);
```

Demonstrate that the function works properly by calling it from main in your program using values for a, b, and c given on the command line. Hint: Roots of the quadratic can be found using the formula:

$$\text{root} = (-b \pm \sqrt{b^2 - 4ac}) / (2a)$$

Please use the name prog2.c for this file.

3. (50) Write a C program that will calculate the average of a set of numbers read from a file using the function calc\_average written by you. The file name will be given on the command line. The following code fragment is an example of how the function is to be used and may be used in your code if you wish:

```
double average, array[50];
int num;
/* Code goes here to read in data from the file (numpts, pt1, pt2, etc) */
average = calc_average(num, array);
```

Here calc\_average finds the average of the num data points contained in array[]. Note that your program should consist of main and calc\_average. Also, main is to print the average value after calling the function. Please use the name prog3.c for this file.

4. Answer the following questions briefly. **Please put your answers at the end of prog3.c as comments.**

a. (10) Write a function prototype for the function calc\_average in problem 3.

b. (10) How should variables be named to make the program self documenting?

c. (10) Why is the use of global variables discouraged?

d. (10) When can a variable be declared in a C program?

e. (10) Explain the significance of argv[0] in

```
void main(int argc, char *argv[])
```

**Note: You may only use the floppy disk that has been provided for this test.** Also, please call your first program prog1.c, your second program prog2.c and your third program prog3.c. It would be a good idea to save backup copies of your programs using file names like prog1bu.c and prog2bu.c. Please return this sheet with your name on it when you return your tests and floppies. **Be sure to include your name as a comment in each program and sign the honor code and write your name on the floppy disk.**

Print your name: \_\_\_\_\_

I have neither given nor received aid on this graded examination: \_\_\_\_\_