CS 2750	**System Programming and Tools**	Test 3
Name:	Spring 2012	Maximum Points: 70

Important: This is an open book test. You can use any books, notes, or paper but no electronic device. *Do not log into the computer during the test, or use any electronic or communications device. Switch off your cell phones. Any device with an* ON-OFF *switch should have its switch in the* OFF *position*. Any calculations and rough work can be done on the back side of the test pages. If there is a syntax error in any program segment, just point it out and you will get full credit for the problem. You will lose five points for not writing your name.

1. [6 pt] In my Korn shell `.profile`, I have created an alias as

   ```
   alias rm='/bin/rm -i'
   ```

   This helps me to avoid accidentally deleting a file. However, I need to delete about 2000 files that I generated to look at some video frames. The files are accessed by the expression `file_????.jpg`. Specify a command so that my alias is overridden just for the duration of that command?

2. [6 pt] I want to count the number of `for` statements in a C source file. There is never more than one `for` statement in a line. However, the problem is that there are some comments that may contain words like `former` and `perform` which may throw my count off. Give me a way to count the number of `for` statements in a correct way. You can use a shell tool of your choice.

3. [10 pt] Write a function in Korn shell that will take one argument and print true if the number in argument is even and false if the number is odd. You do not have to do any data validation. Call the function `even`.

4. [10 pt] You are working on a project that has the file containing the function `main()` always checked into RCS by the team lead or the person responsible for the project. Of course, all the code is being developed in C. Over the course of the project, the team lead may get reassigned. How can you find out the version of the code you are running, and the person responsible for it by using RCS keywords in your C source? Write the code fragment that will achieve this. You need to just define the variables/statements that will be used to print the required information.

5. [6 pt] What is the difference between static and dynamic linking? When you create an executable with dynamic linking, what do you need to do prior to executing that executable so that the libraries can be found.

6. [10 pt] Write code to split an input string (variable `name`) into two output strings (variables `first` and `last`). Assume that the user provides input containing only lowercase and uppercase English alphabets. Assume that there are exactly two capital letters in the input, one at the beginning of the first name and the other at the beginning of the last name. For example, given the input `JoeSmith`, your code should split it into `Joe` and `Smith`. Your code should use the following lines:

```
char name[50], first[25], last[25];
printf ( "What is your name? " );
scanf ( "%s", name );
```

7. [6 pt] What is the output of the following code fragment?

```
unsigned char x, y, z;
x = 15;
y = 35;
z = 133;
x |= 64;
y &= 3;
z = ~z;
printf ( "%d %d %d\n", x, y, z );
```

8. [6 pt] Write a C macro to compute the average of two numbers.

9. [10 pt] Consider the variable declaration below. Write code that opens a file, named `outfile`, for output and uses a single line of code to write the entire inventory to the file.

```
#define      num_items 75
typedef struct
{
    char     name[30];
    int      count;
    float    price;
} inventory_t;

inventory_t inventory[num_items];
```