Computer Science and Engineering 2031.03

Sample Final Test
Aug. 1st 2007

Answer all questions in the space provided

Make sure that you have 9 pages

Student Last Name: ____________________________

Student Given Name: ___________________________

Student Id. No: __________________________________

Question	Value	Score
A	36	
B	24	
C	75	

Question 1. [50 points]

1. [3 points] What is the value of a after the execution of

```
int x;
x = 3;
a = ( ++x ) + ( x-- );
```

2. [3 points] What is the type of x-y in the following piece of code

```
int *x, *y;
/* some more code */
x-y;
```

3. [3 points] What is the typical case of a segmentation violation

4. [3 points] Write a simple example of an enumerated type

5. [3 points] Write an example of using typedef to define a pointer to a structure

6. [3 points] What do square brackets ([and]) signify in a typical manual page on a Unix/Linux system.

7. [3 points] What is the main difference between a union and a struct.

8. [3 points] What are the positional parameters in a shell like bash

9. [3 points] How big is the typical `awk` program

10. [3 points] What is the most suitable tool to print the first 10 lines of a file

11. [3 points] What is *true* in `bash`

12. [3 points] Name two Linux/Unix programs (which we covered in class) that understand regular expressions

Question 2.

[24 points]

1. [3 points] What happens if we export a shell variable in `bash`

2. [3 points] What is the use of back quotes in bash.

3. [3 points] Write a very simple script (you can use any program we covered in class) that prints any line in a file that exceeds three words.

4. [3 points] What type does `malloc` return.

5. [3 points] How do we refer to the parent of the current directory.

6. [3 points] What is a memory leak?

7. [3 points] What does `[ -f bank.c ]` do?

8. [3 points] How do we find the return status of the previous command we executed.

Question 3.

[75 points]

1. [15 points] Fill in the missing spaces in the table below. The first column contains various C constants. Write the type of these constants in the second column and the value (in either decimal or binary, whatever comes easier) in the third. If the constant is not valid, just write ERROR.

Constant	Type	Value
0x1e1f		
1e1f		
0x10FUL		
0.F		
´\123´		
!3		

2. [15 points] Write 3-4 lines of C code to allocate space and assign it to pointer `p`. The pointer to character inside the structure is also allocated space, enough for a standard character string of length 5 (like the word *minas*). You should call only `malloc`.

```
struct tst
{
  int v;
  char *s; /* Needs to store a length 5 char string */
} *p;
```

3. [15 points] Fill the following table with the output of the commands. The first column contains the commands. Write the output of these commands in the second column assuming that variable `x` is set to string `blah`. Write the output of the same commands in the third column assuming `x` is set to string `ls`. If there is an error, just write ERROR. The directory inside which you execute the command contains files `f1` and `f2`.

Command	x=blah	x=ls
echo $x	blah	ls
echo "\$x"	$x	$x
echo ´$x´	$x	$x
echo ‘$x‘	ERROR	f1 f2
echo ‘"$x f1"‘	ERROR	f1
echo "$x *"	blah *	ls *
echo ´$x *´	$x *	$x *

4. [15 points] For the following code fragment, indicate where is the error (line number or line numbers), the nature of the error and how it should be fixed. The error is substantial.

```
1. #include <stdio.h>
2.
3. typedef struct d d;
4. struct d {
5.   d *g;
6.   d *h;
7. } g, *h;
8.
9. int main(){
10.  h = &g;
11.  *h.h = NULL;
12.}
```

5. [15 points] Write a short `bash` script that executes a program named `prog` with standard input redirected from a set of files whose names is of the form `tXX.in` where `XX` can be anything. The output of each file should be redirected to a corresponding file `tXX.out`.