

ECS 30

Practice Midterm

The questions in this document may have appeared in midterms in previous years when this class was taught by different instructors.

1. UNIX commands
 - a. (10 points) You just printed something to printer **hexus**, and find that it's printing a bunch of garbage. What are the steps you take to cancel the print job?
 - b. (5 points) What UNIX command would you type to see a list of all of the files (including the hidden files) in directory **hw1**?
 - c. (5 points) You just wrote and saved the file **test2.c**. Now you want to make sure that only you can read and write it. What UNIX command would you type to make **test.c** only readable and writeable by you?
 - d. (5 points) You want to move all of your C source files (ending in **.c**) and header files (ending in **.h**) from your **hw1** subdirectory to your **mid1** subdirectory. What UNIX command should you type?
 - e. (5 points) You want to view the file **test3.c** a screen at a time. What UNIX command would you type?
2. (50 points) Write a complete, warning-free, C program that lists all of the common factors of two positive integers. The program will prompt the user for the two numbers, and then list on one line all the factors that the numbers have in common. A factor of a number divides into that number with a remainder of zero. The program will continue to ask the user for more pairs of numbers until the first number entered is zero. Your prompts and formats should match that shown. User input is in **bold**.

```
Please enter two positive integers: 20 12  
1 2 4
```

```
Please enter two positive integers: 60 120  
1 2 3 4 5 6 10 12 15 20 30 60
```

```
Please enter two positive integers: 8 9  
1
```

```
Please enter two positive integers: 0 230  
Done.
```

3. (15 points) Consider the following recursive function. What does the function do as whole? (Do not describe what each line does.)

```
void pb(int n) {
    if (n != 0) {
        pb(n / 2);
        putchar('0' + n % 2);
    }
}
```

4. (20 points) Assuming that **a**, **b**, **c**, and **ans** are **ints**, and **a** is **2**, **b** is **4**, and **c** is **7** at the beginning of each statement, write on the line the value of **ans**. There are no syntax errors in these statements.

```
___ans = 2 * 4 / 7 - 2 + 3 - 4 % 7;
___ans = (++a == --b) + 3 * c++;
___ans = (7 / 4 + 4 / 7) * 3 / 4.0 * 8 ;
___ans = 7 < 8 && 8 > 6 || 4 == 4 && !(6 < 5);
___ans = (4 == 4) + ((7 > 7) * 3 || 6 % 3) * 5 + !(6 < 5) * 7;
```

5. (25 points) Given the following series of if statements, provide the outputs for each X. Note that more than one printf can be executed for each X.

```
if (X > 20)
    printf("First ");
else
    if (X < 5)
        printf("Second ");
    else
        printf("Third ");
if (X == 20)
    printf("Fourth ");
else
    if (X < 19 || X > 25)
        printf("Fifth ");
if (X > 5 && X < 22)
    printf("Sixth ");
```

- a.) (5 points) X = 0 _____
b.) (5 points) X = 5 _____
c.) (5 points) X = 17 _____
d.) (5 points) X = 20 _____
e.) (5 points) X = 28 _____
6. (10 points) Given the following **makefile**. After I edit **two.h**, when I type **make**, which files will be changed by **gcc**?

```
whole.out : one.o, two.o, three.o
    gcc -o whole.out one.o two.o three.o

one.o : one.c whole.h one.h two.h
```

```
gcc -c one.c
```

```
two.o : two.c two.h whole.h  
gcc -c two.c
```

```
three.o : three.c three.h  
gcc -c three.c
```

7. (22 points) Data representation

a.) (8 points) Provide the hexadecimal representation for the following int that is presented as a binary number:

```
1100 1010 0101 1111 1000 1110 0111 1011
```

b.) (8 points) Provide the binary representation for the following int that is presented as a hexadecimal number (to help the graders place a space between every four digits):

```
D9AC3E6B
```

c.) (6 points) Provide the decimal equivalent of the following unsigned char that is presented as a binary number:

```
10101011
```