York University
Faculty Science and Engineering
Fall 2008

CSE2031	**Final**	**Software Tools**

Friday, Feb..26th, 2008 08:30 –10:30am

Last Name _____ First name _____

ID _____

Instructions to students:

Answer all questions.
Marks are shown in front of each question number.
Be neat and clean while drawing your logic, block, or state diagrams.

This examination consists of **FIVE** questions

Problem	Points
1	/4
2	/8
3	/4
4	/4
5	/11
Lab test 1	/13
Lab test 2	/16
Total	/60

Question 1 (4 points)

What is the value of the following expression? Give two digits after the decimal point for real numbers.

int a = 3; float b = 1.2; double c = 0.4; float x=1.5;

b = 25 % a – b; Answer: b =

b = a = 3.2 / c - 2.5; Answer: a = b =

c = (int) 2.8 / 0.5 + 12; Answer: c =

x= 1/1+x/1+x*x; Answer: x=

Question 2 (8 points)
Write what each command does in Linux

ls

cd abc

mkdir new

gcc –o code code.c

diff file1 file2

od file1

Assume that myprogram is an executable file that uses
`main(int argc, char** argv).`
For the command
`myprogram input1.txt input2.txt output.txt`

what would be the values of argc and argv[2] respectively:
a. 3 and input1.txt b. 3 and input2.txt
c. 4 and input1.txt d. d. 4 and input2.txt

Question 3 (4 points)

These are four valid C declarations (all related to pointers). Each declaration is followed by a description of what the expression means (in parentheses). Which one of the descriptions is **not** accurate?

a. FILE *fp; (fp is a pointer to a file named FILE.)
b. char *word; (word is a string, or an array of characters.)
c. char *words[ ]; (words is an array of strings.)
d. char **words; (words is an array of strings.)

The following program reads the students' score and calculates the number of students who scored more than 90%. The program also prints a message stating if the student is an A+ or not.
There are some syntax errors, correct it.

```
if(score >=0.9)
    printf("An A+ students \n");
    Aplus = Aplus+1;
else
    printf ("Not an A+ student);
```

Question 4 (4 points)

Consider the following two input files

file1

```
This is line one
Line two
Shorter
However, it could be
Long essay
```

file2

```
C is a very powerful
Programming language
Much faster than awk though
But it may be a
Little tricky
```

And the awk program file

file3

```
{if (NR >2) print NR, $0}
```

What is the output of the following?

awk –f file3 file2 file1

Question 5 (11 points)

Given the variable declarations below:

```
char c, *cp;
int n=2, a[100], *ip;
```

Explain whether the following expressions are legal or illegal. For those that are legal, what are their effect? (or what do they do?)

cp = c;	□Legal	□Illegal
cp = &c;	□Legal	□Illegal
*cp = &c;	□Legal	□Illegal
cp = &a;	□Legal	□Illegal
&cp = c;	□Legal	□Illegal
&cp = &c;	□Legal	□Illegal
ip = &a;	□Legal	□Illegal
ip = a;	□Legal	□Illegal
ip = &a[0];	□Legal	□Illegal
(ip = a) + n;	□Legal	□Illegal
*((ip=a)+n) = 5;	□Legal	□Illegal

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CSE2031 Final Exam (Lab test part)
Fall 2008

LABTEST PART

In this part, you have to write two programs.
Choose one program from programs 1 and 2, and another from programs 3,4

Program 1:

Write a program that reads an integer and writes the digit values in English
The input is one integer; ignore any spaces, or any input after the integer
For example if the input is 1256
The output is:
one two five six
Just one space between 2 words. No spaces before the first word. No spaces or newlines after the last word.

Submit as f1

Program 2:

The numbers from 1 to 100 are placed in a square array of size 10x10 as shown.
Write a program that reads 2 numbers between 1 to a 100 and calculate the area of the rectangle whose diagonal vertices are these 2 numbers.
For example if the two input numbers are 13 56 the output should be
20

1	2	3	4	5	6	7	8	9	10
11	12	13							20
21	..	..							
31									
..									
51	52	53	54	55	56				
91	92	92	..	..					100

If the input is 14 54 the output should be 5

1	2	3	4	5	6	7	8	9	10
11	12	13	14						20
21	..	..							
31									
..									
51	52	53	54	55	56				
91	92	92	..	..					100

Keep in mind the numbers could be entered in any order, for example 13 56 are the same as 56 13

The input

2 numbers at the same line separated by one or more space.

The output

is one integer followed by a new line.

Submit as f2

Program 3:

Write a program that reads some integers from the standard input and expand them
For examples

Input	Output
1 2 3 4 5	1 2 3 4 5
4-9	4 5 6 7 8 9
1 2-6 8 9	1 2 3 4 5 6 8 9
1-3 6 8-12	1 2 3 6 8 9 10 11 12
8-8	8
8-7	

The input is a sequence of integers may be separated by dashes. The integers are separated by one or more space. If we have a dash, then there is no separation between the dash and the two integers it is joining.

The output is a sequence of integers separated by a single space ended by a new line (no space before the new line).

Submit as f3

Program 4:

Write a program that adds two integer numbers of arbitrary length.

The two numbers have a maximum length of 50 digits.
the input is on the form of one number per line, the output is one number followed by a new line.
The two numbers to be added may have leading 0's. The output should not have a zero in the most significant digit position

For example
Input
12345678765891245678190
6541320143451434554341 1

The output is
77758880200405591221601

Submit as f4