Project Submission:

You are requested to submit both hardcopy and softcopy. Hardcopy should contain your source code only. Softcopy (source code only) will be submitted through WebCT also.

Project Rules:

1. You are given 3 grace days throughout the semester to submit your projects. You can divide these days between project1 and project2 as you wish. So if you submit Project1 late by 1 day, you will have only 2 grace days left for Project2.
2. Any cheating in the project will result in ZERO mark.
3. THERE WILL BE NO DIFFERENTIATION BETWEEN THE PERSON WHO COPIES AND THE PERSON WHO LETS OTHERS COPY. Both will have the same penalty.

Project Question:

1. You will implement two programs in this project that are closely related. The first program is called ALU. This program accepts three arguments from the command line. Two arguments are numbers while one argument is one of the operations from '+', '-', '/',' x'. Your main function should read these arguments, if the number of arguments is not 3, then your program should return the value -9999 and exit. If number of arguments is 3, then your program should perform the operation between the two numbers and return the result of the operation.

2. The second program is called CPU. This program will take 1 argument from the command line which will be a filename. Your program should open this file and read mathematical operations from each line. Each line of the file will have one number followed by an operation and then a second number. A sample file is given below.

   3 + 6

   12 – 4

   3 x 10

   4 24

3. For each line in the file, your program should fork a child process, in the child process execute the program ALU and pass it the three values that you read from this line as arguments. Once all lines have been executed, you will wait for the child ALU processes to finish execution and read the return values sent by these processes. You will output the result of the operations in a file called math.txt in the following format

   3 + 6 = 9

   12 – 4 = 8

3 x 10 = 30

4 24 = not enough arguments

Keep in mind that an operation might produce a floating point exception. For example the following is not possible mathematically

6 / 0

For operations like this, your program should report the following in the math.txt file

6 / 0 = illegal operation

You should NOT check for the numbers to be zero. You should get the exit status from the "wait" call and check if the program terminated due to an exception.