

Project 2— Multithread Programming (in Java)
(Due date: 10/22/2009/Thursday)

Your name:	Date:
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=====How To Submit—Read Carefully, Please!=====

1. Create a directory “**project3_YourLastName**” (you must use this format for the directory name for this project; **Use Your Last Name. For example, if your last name is Smith, you should create directory with the name of “project2_Smith”**)
2. Create “**project31src**”, “and “**project32src**”, and **project33src**” subdirectories under “project2_YourLastName” directory.
3. When having finished your project, copy the **source files (*.java, or *.c)** to these subdirectories, respectively—you should keep this folders clean: *only source code* files included.
4. A “readme” file is required for the project write-up that tells how to compile/run the programs and result screenshots ... keep this readme simple!
5. Compress the “**project3_YourLastName**” directory and its contents into a **zip or rar** file with same name.
6. Submit the compressed file to the instructor by email.
7. **Penalty** for NOT following these submission instructions (10% ~100%).

1. **(35 points)** Write a Java thread program that creates 2 threads: 1) one for summation (i.e., given a positive integer N , to calculate $sum = 1 + 2 + 3 + \dots + N$); 2) another for multiplication (i.e., given a positive integer N , to calculate $product = 1 * 2 * 3 * \dots * N$).
 - The sample code (Figure 4.11 on page 164 of the textbook) is a good source to an easy start-up (I have inserted this Figure in our lecture slides for Chapter 4, slide number 25, on the course website).
 - The program will display the results with brief explanation (for example, “thread one: for the summation of 1 through N, the result is ...”).
2. **(65 points)** Complete the Matrix Multiplication Project as described in the textbook (pages 178—181).
 - You need first read through the text for this project. Pay attention to those parts for Java programming. They (together with the Figure 4.11) provide enough know-how to writing a Java program for this project.
 - You need to create **M x N** threads (refer to the text for what are **M** and **N**).
 - Java GUI is not required. Standard input/output are enough.
 - The output (on a command line/terminal) should be formatted like a matrix shown in the following (a 3x3 matrix) (using “\t”, and spaces in the standard output):


```

7   8  99
64  88 12
70  13 77
          
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3. **(Bonus, 50 points)** Redo the Matrix Multiplication Project in Ubuntu (on the VMware player) in C with Pthread (you should use “cc project33.c -lpthread” to generate the executable file).