

EECE 315

Project/Assignment #3

This is a **group assignment**. All group members must equally contribute, cooperate and coordinate.

Deliverable: Submit to **Connect** one **zip file** that includes the final version of all your files. Please find the guidelines for the submission and on the project report on the next page.

Any one of your group members may submit for the group (i.e. all group members will see the same submission dropbox), please coordinate. You may submit up to two times before the deadline; we will mark the last submission.

Github: As before, every group member must use github to collaborate. You are to record reasonably regular snapshots of your progress (at least three time) to github. Create the folder PA3 and save your files in that directory.

Due date: Friday Feb 13, 2015 by 3:00 PM

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Submission: Submit one .zip file that includes **three .pdf files** and **two directories**.

- The first .pdf file includes the solutions to questions 1 to 2.
- The second .pdf file is your project report for Project 1, and the third .pdf is your project report for Project 2 (see below).
- The two directories include the c file(s) and the related files for the two projects.
- Please only use the formats specified. That is .zip for the main file (should easily be opened in Ubuntu or Windows), .pdf (or html, to be portable, there are many free pdf creator software), and the .c file formats. Please name the zip file G_groupNum.zip where groupNum is *your group number*.
- All .c code files should include sufficient comments, and the projects should compile and work correctly according to the specification.
- Some marks will be dedicated to following the guidelines.

Project report: The project is explained in a formal report that has the following sections:

Front page - names and student numbers of all members in your group, title, date submitted, ...

Contribution page - Clearly state the contribution of each group member in the project.

This info page should be in percentage, as well as in words specifying which tasks, design, coding, debugging, etc each group member contributed to.

Introduction - A brief description of the introductory and required information related to the project, such as the problem statement, high-level flowchart and the project benefits.

Solution - A complete description of your approach to solving the problem, such as the implementation, techniques, and explanation of your code (the code itself is submitted by the .c files; see submission guidelines).

Debugging - An outline of any problems you ran into, any test sets used to check the correctness of the code, ...

The report should include relevant figures, comments, test cases, conclusion, and any appendixes needed. Do not include the complete code with the report, though including small code segments that are necessary for your explanations is fine.

The length of the report is up to you. It should be just long enough to sufficiently explain the project as outlined above. Use an 11pt font size (Times New Roman). It should not be longer than 4 pages (excluding the front page, contribution page and any possible appendixes).

You may be invited later on to defend/present your project.

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Question 1) Operating systems and sustainability: outline two methods, concepts, or practices that if applied to or used in operating systems, they will help us achieve better **sustainable development** or green computing. Explain the problem and solutions clearly.

Question 2) Linux source code

A) State the reason(s) mentioned in the main Linux Makefile on why make's built-in rules and variable are not used. (See <http://lxr.linux.no/linux+v3.6.3/Makefile> or <http://lxr.free-electrons.com/source/Makefile>)

B) Briefly state the reason(s) given in linux's mutex-design.txt file on why mutex is defined, in addition to semaphores.

(See <http://lxr.free-electrons.com/source/Documentation/mutex-design.txt?v=3.17> or <http://lxr.linux.no/linux+v3.6.3/Documentation/mutex-design.txt>)

3) Project1: Sudoku Solution Validator

- The description of this programming project is on pages 197 to 198 of the textbook.
- You need to solve the problem using **Pthreads** only.
- As usual, use Ubuntu and include a make file. The make file should include all dependencies that build your program. See the guideline.

We will use this project to also evaluate your tool identification and tool assessment skills. Use the very **same headings** as below in the project report. You must clearly explain:

Tool Identification and Application: Identify the current tools for design of and testing the validity and completeness of the solutions to this project.

Tool Assessment: Verify the credibility of results achieved using these tools. Appreciate the accuracy and explain the limitations of the tools and the assumptions inherent in their use.

4) Project2: Dining Philosophers Problem

- The description of this programming project is on page 252 of the textbook.
- You need to solve the problem using **Pthreads** only.
- As usual, use Ubuntu and include a make file. The make file should include all dependencies that build your program. See the guideline.
- Submit separate project reports for projects 1 and 2. See the submission guidelines.

We will use this project to also evaluation your problem analysis skills. Use the very **same headings** as below in the project report. You must clearly explain:

Problem Identification: Identify known and unknown information, uncertainties, and biases when presented with the problem.

Process Planning: Create process for solving problem, including forming justified approximations and assumptions.

Model Selection and Application: Select and apply appropriate quantitative models and analysis to solve problems.

Solution Evaluation: Evaluate validity of results and model for error and uncertainty.