Homework #2:First Order Systems and PSoC Prep

Due Thursday, 9/3/15 hardcopy in lecture and softcopy in Canvas

Where applicable, use the Homework Template file (<http://www.engr.sjsu.edu/bjfurman/courses/ME190/HW_related/HW_template.docx>) for your homework responses. Don’t forget to fill out the cover sheet completely. Include a summary of what the assignment was about, and what you learned in doing it. Where written responses are requested, please type them. Make sure that you show how you arrive at any answers involving numerical calculations. Answers that do not show intermediate steps will likely not earn many, if any points. Remember that you must turn in a softcopy of your work in Canvas in order to receive any credit for this assignment. Hand written solutions can be included by scanning them or by including a *clear* picture of them in the softcopy submission. (Be aware that if the scan or picture is not legible for the grader, you will likely not receive credit for your submission!) Copy and paste additional table cells as needed. For answers completed using Matlab, use the Publish feature to create your output. These can be included in your submission as separate files, if desired, and indicated as such in the homework template (e.g., “See published result for Problem XYZ attached separately”), but don't forget to attach the files to your submission!!!!

1. (2 pts) Download and install PSoC Creator. See: <http://www.cypress.com/products/psoc-creator> . Show evidence that you successfully installed the software.
2. (2 pts) Get your CY8CKIT-044 PSoC® 4 M-Series Pioneer Kit, and show evidence that you were able to successfully connect to the board. There are multiple sources for the kit:

<http://www.cypress.com/documentation/development-kitsboards/cy8ckit-044-psoc-4-m-series-pioneer-kit>

<http://www.digikey.com/en/product-highlight/c/cypress/cy8ckit-044-psoc-4-m-series-pioneer-kit>

1. Watch the PSoC Creator 101 videos. There are eight of them. See: <http://www.cypress.com/documentation/other-resources/psoc-creator-training>
2. (2 pts) From [Lesson 1: Introduction to PSoC Creator 101](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-1-introduction-0/108116), which PSoC kit were the videos in the series designed for? Can the concepts be applied for the other kits?
3. (2 pts) From [Lesson 2: Introduction to PSoC](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-2-introduction-psoc/108121), when was the PSoC developed? What was the major goal for the development of the PSoC?
4. (2 pts) From [Lesson 3: Getting to Know PSoC Creator](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-3-getting-know-psoc-creator/108126), how does Alan Hawse typically start a PSoC design? How many components does Creator have for you to choose from?
5. (2 pts) From [Lesson 4: Let's Get an LED to Blink Part 1](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-4-let-s-get-led-blink-part-1/108131), which Creator component is used in this lesson? Which view in Creator allows you to assign components to pins on the PSoC chip?
6. (2 pts) From [Lesson 5: Let's Get an LED to Blink Part 2](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-5-let-s-get-led-blink-part-2/108136), what is the difference in how the LED is blinked in this lesson compared with Lesson 4? What feature of Creator is used to allow you to show an entire schematic, not just what is contained the PSoC?
7. (2 pts) From [Lesson 6: Let's Get CapSense Working](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-6-let-s-get-capsense-working/108141), why is capacitive sensing used now? What is the default setting for a linear slider?
8. (1 pt) From [Lesson 7: IDE Export](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-7-ide-export/108146), if you wanted to use a different Integrated Development Environment, which menu choice is needed to get the Creator project over to another IDE?
9. (2 pts) From [Lesson 8: PSoC Resources](http://www.cypress.com/video-library/PSoC-Software/psoc-creator-101-lesson-8-psoc-resources/108151), explain how Creator facilitates documenting your design using the PSoC.

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**Exercise 4) Reading from the textbook - Read Chapter 5 – Linear Systems in the Astrom and Murray text (**[**http://www.cds.caltech.edu/~murray/amwiki/index.php/Main\_Page**](http://www.cds.caltech.edu/~murray/amwiki/index.php/Main_Page)**)**

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4a) (5 pts) Do Problem 5.7 from the Astrom-Murray text.