Homework 1 : CMPS 499 003 Embedded Software Systems

Date Assigned: Tuesday Aug 28, 2007
Date Due: Thursday Sept 06, 2007

Note: For this homework, please refer to the first chapter of the book by Frank Vahid & Tony Givargis (a copy of the book is available in the reference section of the Doupre' Library)

Q1. Explain in your own words what an embedded system is and give 10 examples of everyday appliances/usage in which embedded systems are used.

Q2. Explain the following terms briefly:

i) NRE Cost
ii) Unit Cost
iii) Time-to-prototype
iv) Time-to-market
v) Maintainability
vi) Market Window

Q3. For a particular product, you determine the NRE cost and unit cost to be the following for the three listed IC technologies: FPGA: ($10,000, $50); ASIC: ($50,000, $10), VLSI: ($200,000, $5). Determine precise volumes for which each technology yields the lowest total cost.

Q4. Draw the general architectures and briefly discuss differences among the following types of embedded processors: i) General purpose processor ii) Application-specific processor, and iii) Single purpose processor.

Q5. Refer to Figure 1.4b which is a simplified revenue model for computing revenue loss from delayed entry of an embedded processor. Assuming a product lifetime of 200 weeks how much revenue loss will be incurred due to a delayed entry of the product by 6 weeks?

Objective of this homework

The objective of this homework is to refresh the concepts learned during the first 3 lectures. The definitions, terminologies, and market impact asked through these questions are central to gaining a basic understanding of embedded systems.