

CMPSCI 521/621
Homework #1
September 15, 2006
Due: October 4, 2006

- 1) Discuss the advantages and disadvantages to:
 - a) The "waterfall" (with feedback) process model (15 pts)
 - b) The "extreme programming" process model (15 pts)
- 2) In terms of budget, schedule, requirements and risk, describe when the Boehm spiral model essentially mimics the waterfall, agile, and prototyping processes. (20 pts)
- 3) Compare "agile," "plan-driven" and risk-driven" process models. (20 pts)
- 4) Inspections, walkthroughs and code reading are forms of reviews. (6 pts each)
 - a) Distinguish among these three techniques in terms of focus, number and type of persons involved, formality, and any other characteristic you feel is pertinent.
 - b) What are the primary advantages and disadvantages of reviews?
 - c) What are the two most important features of an effective inspection? Why?
 - d) Where might automation be possible and/or appropriate?
 - e) Describe the form of review used in the Cleanroom process and contrast with Fagan inspections.
- 5) **[621 only]** What does it mean when we say an analysis technique is **conservative**? Give an example using (syntactic) control dependence analysis and another example using (syntactic) data dependence. (10 pts)
- 6) **[621 only]** It might seem counter-intuitive that a model of the program that over-approximates the executable behavior would be smaller than a model that is more precise. Using a computation tree and a CFG, present an example that illustrates this point and explain. (10 pts)

Submitting Homework, you may:

- Email your homework to Anna Grishkan (agrishka@cs.umass.edu) or me (adrion@cs.umass.edu) in text, MSWord, PDF or some other format that we can print. Homework submitted via email must have a postmark before 4 pm on the date the homework is due.
- Turn in written/printed solutions to the CMPSCI front office on or before 4 pm on the due date to Pauline Hollister
- FAX your homework (**definitely not recommended**) to 413-545-3729 before 4 pm on the due date.
- **Do not drop off homework** in my or Anna Grishkan's mailbox nor at our or Wendy Cooper's offices. **We cannot guarantee receipt if you do not email the solutions or drop them off with Pauline.**
- **Unless you have obtained prior approval for an extension, 5 pts/day (or part thereof) will be deducted from your score.**
- I expect you to do **independent work** unless specifically indicated. **Failure to do this will result in penalties.**