

Final Exam Study Guide Open book/notes

Time: Monday May 10, 9:45 -- 11:45 am

Location: 40 SH (our classroom)

Major topics (comprehensive):

- induction and recursion (chap 3 of Grassmann & Tremblay)
- sets, relations & functions (chaps 5 & 6 of Grassmann & Tremblay)
- graphs & trees (chap 7 of Grassmann & Tremblay)
- propositional & predicate logic (chaps 1-4 of Grassmann & Tremblay)

The final exam will be comprehensive, but will emphasize material since the second in-class exam. Approximately one hour of the exam will cover the last segment of the course, and the other hour will emphasize all parts of the course approximately equally. Since the final exam is comprehensive, it will be useful to reconsider the previous study guides (and the exams themselves). Also, make sure any difficulties on homework problems have been resolved.

You are welcome to examine your final exam, and since you may well have left campus before grading is complete, I will retain them until the beginning of next fall. However, all homework that is not retrieved by the end of exam week will be discarded. For picking up homework or any final questions about homework scores, you can contact the TAs at the following times:

W. He — 10-11 AM Thursday 5/13

S. Pandit — 11-12 AM Tuesday 5/11

Study Questions on Logic

Two functions f & g of the Boolean variables P , Q , and R are defined in the table below. Provide a propositional formula that expresses each of them and explain your answers.

P	Q	R	f	g
T	T	T	F	T
T	T	F	F	T
T	F	T	T	T
T	F	F	F	T
F	T	T	F	F
F	T	F	F	T
F	F	T	F	T
F	F	F	F	T

Are the two propositional formulas $P \wedge (Q \wedge R)$ and $(P \wedge Q) \wedge R$ logically equivalent? Justify your answer.

Show that the predicate logic formula $(\exists x P(x) \wedge \exists x Q(x)) \wedge \exists x (P(x) \wedge Q(x))$ is invalid.

Problem 2, page 91 of Grassmann & Tremblay.

Write a Prolog predicate definition for 'beginningOf(List, Count, Begins)' that succeeds when Begins is a list of the first Count items in List, e.g., the query

?- beginningOf([a,b,c,d,e],3,Xs).

succeeds with Xs=[a,b,c]. You may use any of the predicate definitions discussed in class, and the outcome when List has fewer than Count items can be chosen at your discretion. Explain why your definition is a valid solution.