

CS 536 Activities for Lecture 1

Activity 1.1: Program Verification & Testing

A. Why?

- We'll be using active methods throughout the semester, so we should practice them.

B. Outcomes

At the end of this activity you should:

- Practice forming small groups, discussing questions, and forming answers.
- Have a list of topics you think this course might/should/could cover.
- Have a list of reasons why this course might help you someday (or could've helped in the past).

C. Form Teams

- Get together in groups of five.
- Agree on someone to be the speaker for the group; the speaker will communicate with the instructor and the rest of the class.

D. Questions

As a group, discuss the questions below. Write out your group's results so we can compare different groups' results. Note: Activities are not graded.

1. (Vocabulary Brainstorm) What words/phrases come to mind when you think of the topics "Program Verification" and "Program Testing"?
2. From the list for Question 1, pick any or all of the words/phrases that you think we should or might want to cover in the course. Assign rough priorities if you like: High/medium/optional.)
3. List one or more situations you've been in where it would've been helpful to know more about some of the items in your list.

Activity 1.2: Propositional Logic

A. Why?

- Reviewing/overviewing logic is necessary because we'll be using it in the course.

B. Outcomes

At the end of this activity you should:

- Be able to read and write propositional formulas.
- Be able to develop truth tables for propositional formulas.
- Have a bit of practice reading and doing logical manipulations on propositional formulas.

C. Questions

As before, get together in groups of five and agree on someone to be the speaker. As a group, discuss the questions below; write out your group's results.

1. What is the minimal parenthesization of
 - a. $\neg(p \wedge ((\neg q) \rightarrow r)) \vee (s \wedge (t \wedge v)) \rightarrow x$?
 - b. $(p \leftrightarrow q) \wedge (q \leftrightarrow r)$?
 - c. $(p \wedge q \wedge r) \vee (\neg p \wedge \neg q \wedge \neg r)$?
2. Which of $p \rightarrow q \rightarrow r$, $p \rightarrow (q \rightarrow r)$, and $(p \rightarrow q) \rightarrow r$ are syntactically equivalent (\equiv) ?
3. Write out truth tables for $p \leftrightarrow (q \leftrightarrow r)$ and $(p \leftrightarrow q) \wedge (q \leftrightarrow r)$. Are they semantically equivalent? (i.e., do they have the same truth table rows?)
4. Repeat the previous question on $(p \leftrightarrow q) \wedge (q \leftrightarrow r)$ and $(p \wedge q \wedge r) \vee (\neg p \wedge \neg q \wedge \neg r)$.