

Today: Preliminaries. § 0.*.

Next class: Introduction; recursion theorem (informal). §§ 0.*, 6.1.

Reminder: Read the syllabus. Read the book. Use the newsgroup. Do not fall behind.

1. List the members of your group below. Underline your name.

2. Use the scheme described on p. 247 of the textbook to generate a concrete implementation of the *self* program.

Ask questions and use group discussions to clarify ideas.

Explain how your program works by detailing the correspondence between its elements and those in the description.

3. Let $A = \{1, 2, 4, 8, 16, \dots, 1024\}$ and $B = \{n \in \mathbb{Z} \mid 0 < n \leq 100 \wedge \sqrt{n} \in \mathbb{Z}\}$.
- (a) Provide a compact implicit definition of A .
 - (b) Enumerate the elements of B .
 - (c) Enumerate each of the following. You may abbreviate if the result is clear and unambiguous.
 - i. $A \cup B$
 - ii. $A \cap B$
 - iii. $A \setminus B$
 - iv. $A \times B$
 - v. $\mathcal{P}(B)$

4. With all variables ranging over the set \mathbb{Z} , for each of the following logical sentences, (1) provide a brief but precise English equivalent, (2) provide a prenex normal form equivalent, and (3) either prove or disprove it.

- (a) $\forall y \exists x [\nexists w [w = x^2] \wedge \exists z [x < y < z]]$
- (b) $\exists x \forall y [\nexists w [w = x^2] \wedge \exists z [x < y < z]]$