

Program Verification - Assignment 7

Your Name(s)

November 12, 2025

1 T21: Warmup: Predicates and entailment

- 1.1 (a) Define the predicate tree(x)
- 1.2 (b) Implement the method client
- 1.3 (c) Implement left_leaf and right_leaf functions
- 1.4 (d) Prove the entailment

2 T22: Tree Rotations

- 2.1 (a) Implement rotateRight
- 2.2 (b) Call rotateRight with tree t
- 2.3 (c) Show memory-safety
- 2.4 (d) Show height changes by at most 1
- 2.5 (e) Show in-order traversal preservation
- 2.6 (f) Show in-order traversal is (1, 5, 2)

3 T23: Separation Logic

- 3.1 (a) Prove soundness of frame rule
- 3.2 (b)-(h) Prove or disprove triples

4 T24: Partial Permissions

- 4.1 (a) Update operational semantics
- 4.2 (b)-(e) Prove or disprove triples