

# Program Verification - Assignment 7

Your Name(s)

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## 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