

CMSC330 Practice Problems 9

1. Operational semantics

Use operational semantics to determine the values of the following OCaml codes:

- a. 1
- b. $3 + 7$
- c. $1 + (2 + 3)$
- d. $(\text{fun } x \rightarrow 4) 5$
- e. $(\text{fun } x \rightarrow x + 6) 7$
- f. $(\text{fun } x \rightarrow (\text{fun } y \rightarrow y + x)) 8 9$
- g. $\text{let } x = 5 \text{ in let } y = 7 \text{ in } x + y$
- h. $\text{let } x = \text{let } x = 5 \text{ in } x + 2 \text{ in } x + 4$
- i. $\text{let } f = \text{fun } x \rightarrow x + 5 \text{ in } f 7$
- j. $\text{let } y = 5 \text{ in let } f = \text{fun } x \rightarrow x + y \text{ in let } y = 6 \text{ in } f 7$ (for static scoping)
- k. $\text{let } y = 5 \text{ in let } f = \text{fun } x \rightarrow x + y \text{ in let } y = 6 \text{ in } f 7$ (for dynamic scoping)