CSN312 Tutorial 1 10.2.2025

I. Parse tree generation of lambda terms

1. $(\lambda x.x)\, y$

2. $\lambda x.(x\, y)$

3. $M\, N\, P$

4. first

5. sa sa

6. $\lambda x.\lambda y.\lambda z.x\, y\, z$

II. Correctly parenthesize a lambda term

1. $\lambda x.x\ \lambda y.\ y\, x$
2. $id\ id\ \lambda x.\ x\, id\, z$

III. Removal of parenthesis from a lambda term such that the meaning remains unchanged

Use the answers from II and then establish the terms given in II.

IV. Find the set of free variables and show the scope of the variables

1. $\lambda x.x\, y\ \lambda x.y\, x$
2. $\lambda x.\ (\lambda y.\lambda x.x\, y\ )\ x\, y$

V. Reduction of lambda terms (use CBN and CBV separately, if applicable)

1. $(\lambda g.\ g\, 5\ )\ (\lambda x.x + 3)$
2. $(\lambda x.x\, x\, x)\ (\lambda x.x\, x\, x)$