CS232-Jan21

Mini Assignment: Lambda Calculus

(Due on 16th April 2021, 11:59 PM)

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Instructions:

- Answers should be typeset in Latex. There will be points for good typesetting using latex. (Poorly typeset documents will get less points.)
- Report your finding in a .pdf format. Name the file as <roll_number.pdf> (For example, CS19BTECH11000.pdf).
- You are allowed to implement helper functions for the functions requested.

1. Exercise#9 (Page 10), Exercise#10 (Page 16)

2. Exercise#13 (Page 15) and #14 (Page 15).

3. Define NAND, NOR and XOR functions using lambda expressions.

4. Exercise#15 (Page 20)

5. Exercise 17 (Page#18)

6. Exercise 19 (Page#19)

7. Exercise 22 and Exercise 23 (Page#22)

8. Exercise 34 (Page#41)

9. Define the following using lambda expressions:
    a. Y combinator
    b. Theta combinator
    c. ω combinator
    d. Factorial function using the combinators from previous parts

References:

- The references are to Mike Gordon's Lecture Notes on Functional programming that we studied in the class. The local copy is the following Mike_Gordon_Functional_Programming_Notes.pdf
- Functional Programming Lambda Calculus
- lambda-calculus-Combinators_CollectedLambdas.pdf