Perspectives in Mathematical Sciences IV/II (Fall 2023)
Report for Part 3

Report delivery and deadline

Send you report to `garrigue@math.nagoya-u.ac.jp` by Tuesday 2024/01/30.

You can write your report either in English or Japanese, but English is prefered.
You should solve **both** problems A and B.

Problem A

1. Compute the normal form of $c_2 \, c_2$ (as untyped Church Numeral).

2. Find T such that $\Lambda X.c_2[T] \, (c_2[X])$ is well typed (using Church Numerals in System F), and compute the normal form.

Problem B

1. Write the typing derivation of

$$\lambda f : A \to B \to C.\lambda g : A \to B.\lambda x : A.(f \, x) \, (g \, x)$$

   in the simply-typed lambda-calculus.

2. Write the corresponding proof in propositional logic.