Math 29: Computability Theory **Spring 2024**

PSET 2 — 04/12/2024

Prof. Miller ***Student: Amittai Siavava***

Problem 1.

Show that the Fibonacci function, where $f(0) = f(1) = 1$ and $f(n+2) = f(n+1) + f(n)$ is computable by building a register machine.

Problem 2.

Show that the set of powers of 2 is computable by building a Turing machine.

Problem 3.

Show that the set of multiples of 4 is computable by building a Turing machine.

Problem 4.

Give a numerical code for the Division register machine provided in Monday's class according to the coding scheme established Friday. *(Do NOT multiply it out into decimal!)*

Problem 5.

Describe informally what process you would use to determine if the register machine coded by n contains a subtraction node. You may assume that the n you are given is a valid code for a register machine. *You do not need to provide a machine which runs your process.*