

ESO207A: Data Structures and Algorithms

Theoretical Assignment 1

Deadline: 17th Jan, 2018

January 10, 2018

Problem 1. (15 marks) Design ADT for the universe of n (constant) digit natural number with operations (constant, succ, addition multiplication, etc.) to support arithmetics involving n digit natural numbers using arrays and linked list ADTs. Define exceptions if any.

Problem 2. (10 marks) Design ADT for Queues and sequence.

Problem 3. (15 marks) Give a RAM Program for computing n^k , using squaring each time.

Problem 4. (10 marks) Write a TM program for doubling of an input consisting of k consecutive 1s. Replace the input with $2k$ consecutive 1s.

Problem 5. (10 marks) Write a TM program that accepts a binary number if it is divisible by 3.