H2 Computing Practical Worksheet – T1W1

1a Write the code for an interface to input and save NRIC numbers into a text file.

Program requirements:

- Your program is to utilise a text-based interface to repeated prompt the user to input NRIC numbers.
- Each NRIC number entered should be validated to ensure that it conforms to the Structure of the NRIC number/FIN – refer to: https://en.wikipedia.org/wiki/National_Registration_Identity_Card#Structure_of_the_NRIC_number/FIN
- Each NRIC that is input should be saved to the file: NRIC_DATA.TXT

1b Design a set of tests (as a script) to evaluate the program you wrote in **1a**. You should between 4 and 10 test cases. Use these (i.e., the valid cases) to populate the file NRIC_DATA.TXT.

1c Write a script to randomly populate the file NRIC_DATA2.TXT with 20 NRIC numbers (these numbers should conform to the rules governing acceptable NRIC numbers).

1d Write the code to perform a sort over all the NRIC numbers stored in NRIC_DATA2.TXT (in ascending order). You should use the insertion sort algorithm to perform this sort.

1e Design and implement an object oriented BST. It should include the following methods:

- Initialisation – initialises an empty BST
- Insertion – inserts a new element of the object being stored in the BST
- Find – returns TRUE if the target object exists in the BST, or else returns FALSE
- Print Pre-order – utilises pre-order traversal to print the contents of the BST
- Print In-order – utilises in-order traversal to print the contents of the BST
- Print Post-order – utilises post-order traversal to print the contents of the BST

1f Write a script that populates an instance of your BST with the contents of both NRIC_DATA.TXT and NRIC_DATA2.TXT. Your script should also print the contents of your BST in pre-order, in-order and post-order.