INFORMATICS INSTITUTE OF TECHNOLOGY

UNIVERSITY OF WESTMINSTER

INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

BEng. (Hons) in Software Engineering

6SENG005W : Formal Methods

Coursework

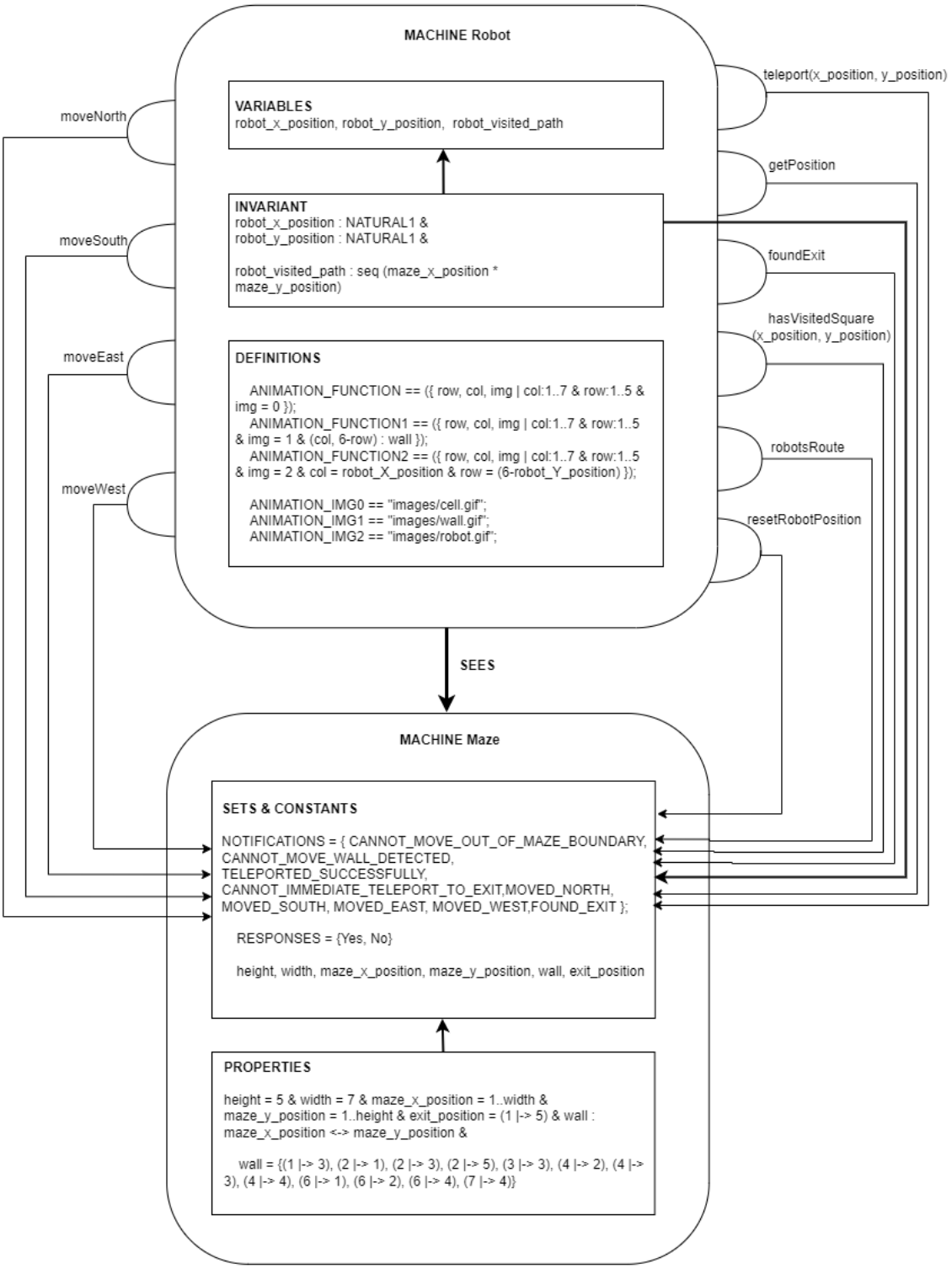
Student Name : I.A. Oshini Ilukkumbura

UOW No : w1790248

IIT No : 2019757

Group E

Structure Diagram



Explanation of Invariants

Invariants of Robot machine

robot_x_position: NATURAL1

Represents the current x axis position of the robot.

This only can have natural numbers starting from 1.

robot_y_position : NATURAL1

Represents the current y axis position of the robot.

This only can have natural numbers starting from 1.

robot_visited_path : seq(maze_x_position * maze_y_position)

This contains path of squares that the robot has moved as a sequence, and it includes two integer values which are the robot's current x coordinates and y coordinates respectively.

Explanation of Constants

height	Integer value which defines the height of the maze
width	Integer value which defines the width of the maze
maze_x_position	Range of x coordinates from 1 to 7
maze_y_position	Range of y coordinates from 1 to 5
wall	Set of x and y coordinates of the blocked cells where the robot cannot move
exit_position	x and y coordinates of the Exit position