INFORMATICS INSTITUTE OF TECHNOLOGY

UNIVERSITY OF WESTMINSTER

INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER (UOW)

BEng. (Hons) in Software Engineering

Reasoning About Programs

6SENG003C

CW 1

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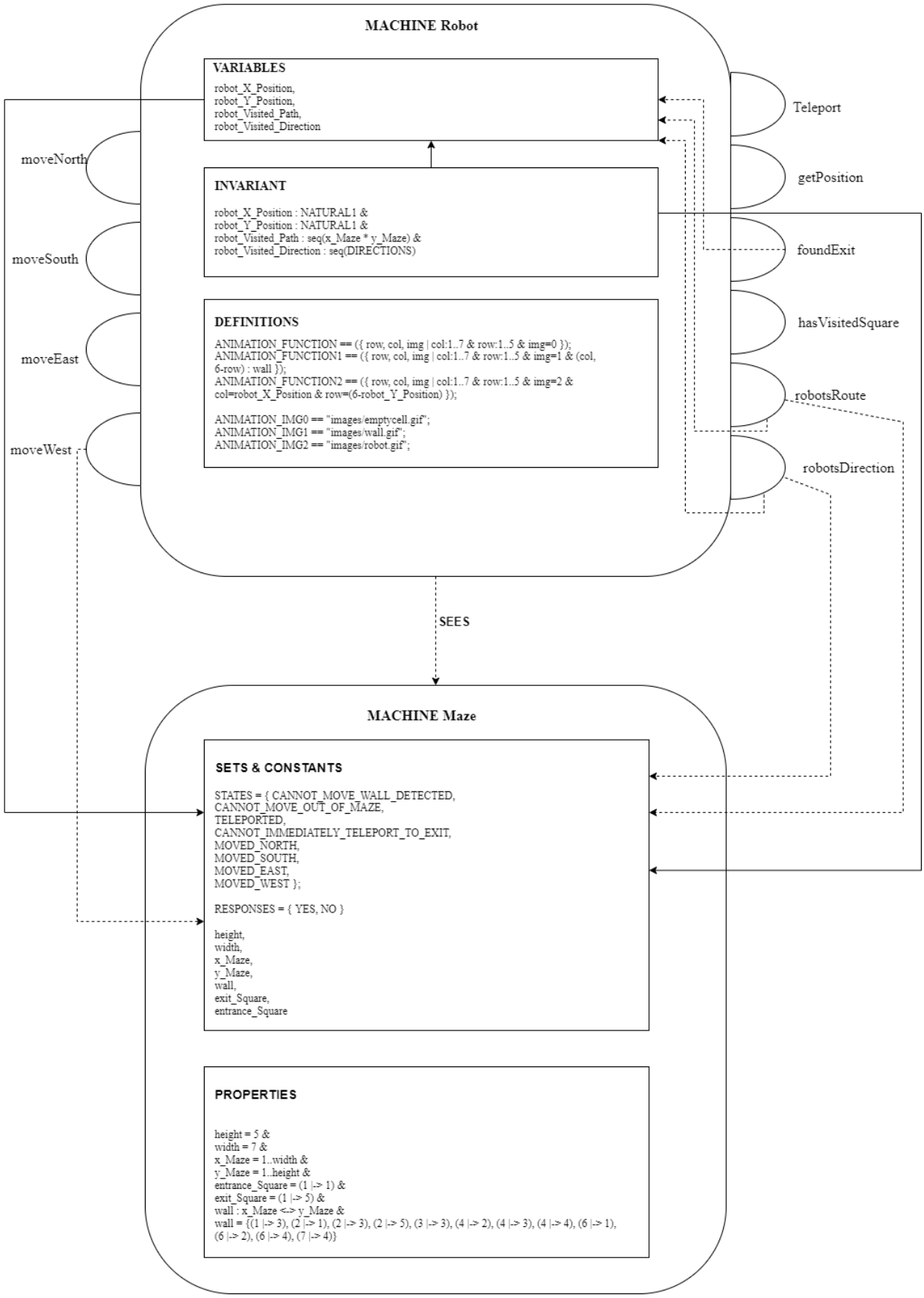

Figure 01 – Structure Diagram of Robot and Maze Machines

Machine Robot

INVARIANT

robot_X_Position: NATURAL1 - Robot's current x position and can only have Natural numbers starting from 1.
robot_Y_Position: NATURAL1 - Robot's current y position and can only have Natural numbers starting from 1.
robot_Visited_Path: seq(x_Maze * y_Maze) - To keep a track of Robot's moved paths as a sequence and it contains two integer values.
robot_Visited_Direction: seq(DIRECTIONS) – Sequence of directions of the SET DIRECTIONS. This will contain a sequence of visited directions which will get updated for every move that robot takes in the maze.

Machine Maze

CONSTANTS

height - This is an integer value and it define the number of rows in this Maze.
width - This is an integer value and it define the number of columns in this Maze.
x_Maze - This is the range of x values starting from 1 to 7.
y_Maze - This is the range of y values starting from 1 to 5.
Wall - This holds a set of x and y coordinates of the blocked cell in this Maze.
exit_Square, - This holds the exit position's x and y values.
entrance_Square – This holds the entrance position's x and y values.