INFORMATICS INSTITUTE OF TECHNOLOGY

UNIVERSITY OF WESTMINSTER

INFORMATICS INSTITUTE OF TECHNOLOGY

In Collaboration with

UNIVERSITY OF WESTMINSTER

6SENG005W Formal Methods Coursework

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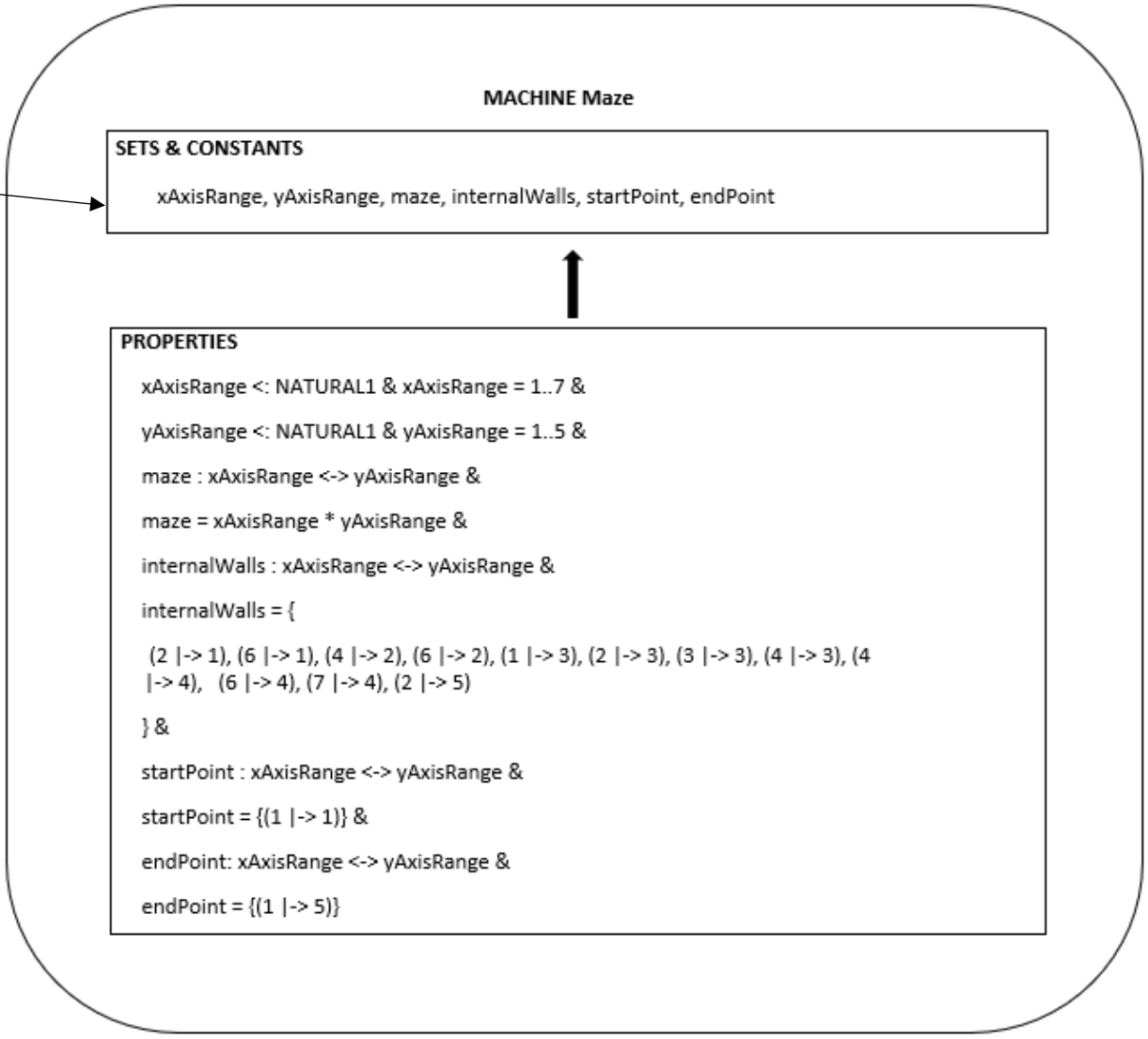
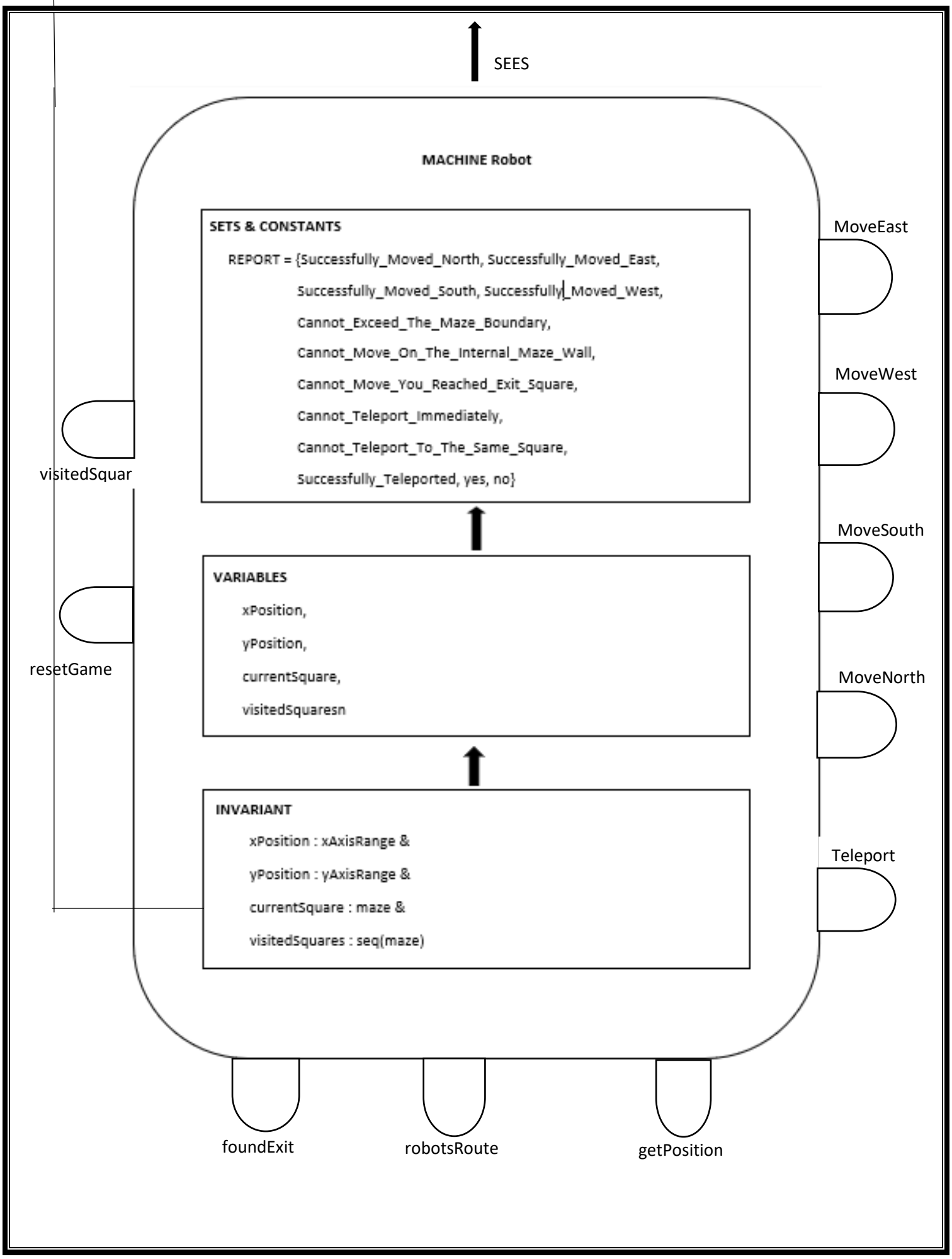
The Structure Diagram




SEES
MACHINE Robot
SETS & CONSTANTS
REPORT = {Successfully_Moved_North, Successfully_Moved_East,
Successfully_Moved_South, Successfully_Moved_West,
Cannot_Exceed_The_Maze_Boundary,
Cannot_Move_On_The_Internal_Maze_Wall,
Cannot_Move_You_Reached_Exit_Square,
Cannot_Teleport_Immediately,
Cannot_Teleport_To_The_Same_Square,
Successfully_Teleported, yes, no}
VARIABLES
xPosition,
yPosition,
currentSquare,
visitedSquaresn
INVARIANT
xPosition : xAxisRange &
yPosition : yAxisRange &
currentSquare : maze &
visitedSquares : seq(maze)
MoveEast
MoveWest
MoveSouth
MoveNorth
Teleport
visitedSquar
resetGame
foundExit
robotsRoute
getPosition

- **xAxisRange:** It is a set used to save the x-axis range 1 to 7, as well as a subset of natural numbers.
- **yAxisRange:** It is a set used to save the y-axis range 1 to 5, as well as a subset of natural numbers.
- **maze:** maze is an element of the relation between x axis range and the y axis range (x |-> y)
- **internalWalls:** this constant used to save the internal walls and it's also blowing to relation between x axis and y axis
- **REPORT:** this a predefined set which contain all the message which are return by the operation
- **xPosition:** it is a variable which is belongs to the xAxisRange set and this variable is used to save the robot x axis position
- **yPosition:** it is a variable which is belongs to the yAxisRange set and this variable is used to save the robot y axis position
- **currentSquare:** it is a variable which is belongs to the maze set and this variable is used to save the robot current positions
- **visitedSquares:** this variable is a sequence which is use to save all the visited squares