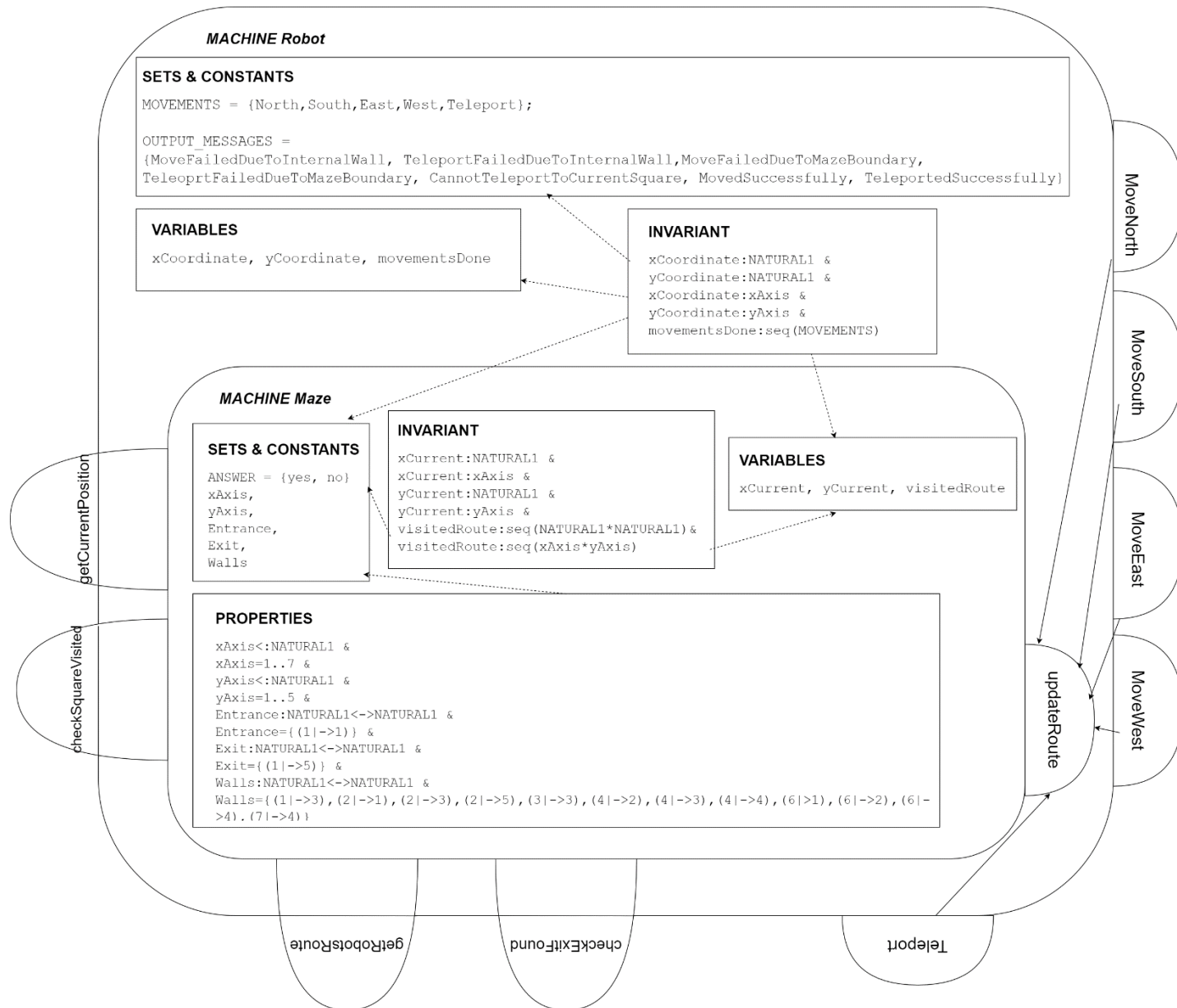


# Structure Diagram



## Explanation of the state invariants

### Machine Robot

**xCoordinate:NATURAL1** - This invariant remark that the x coordinate of the square where the robot is currently in, should always be a value in the range of natural numbers starting from 1.

**yCoordinate:NATURAL1** - This invariant remark that the y coordinate of the square where the robot is currently in, should always be a value in the range of natural numbers starting from 1.

**xCoordinate:xAxis** - This invariant remark that the x coordinate of the square where the robot is currently in, should only be in the width values range of the maze.

**yCoordinate:yAxis** - This invariant remark that the y coordinate of the square where the robot is currently in, should only be in the width values range of the maze.

**movementsDone:seq(MOVEMENTS)** - This invariant remark that the list of movements that are done by the robot, are in the form of a sequence, where the values should only be a name of a MOVEMENT. MOVEMENTS is an enumerated set.

### Machine Maze

**xCurrent:NATURAL1** - This invariant remark that the x coordinate of the square where the robot is currently in, should always be a value in the range of natural numbers starting from 1.

**xCurrent:xAxis** - This invariant remark that the x coordinate of the square where the robot is currently in, should only be in the width values range of the maze.

**yCurrent:NATURAL1** - This invariant remark that the y coordinate of the square where the robot is currently in, should always be a value in the range of natural numbers starting from 1.

**yCurrent:yAxis** - This invariant remark that the y coordinate of the square where the robot is currently in, should only be in the width values range of the maze.

**visitedRoute:seq(NATURAL1\*NATURAL1)** - This invariant remark that the path of the robot on the maze, is in the form of a sequence, where it's values are in the form of a mapping of two numbers that are in the range of natural numbers starting from 1.

**visitedRoute:seq(xAxis\*yAxis)** - This invariant remark that the path of the robot on the maze should be in a form of a sequence where it's values are in the form of a mapping of two numbers that are only in the range of the maze's width and height. In other words, visited route values should only be within the area of the maze.