INFORMATICS INSTITUTE OF TECHNOLOGY

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In collaboration with

UNIVERSITY OF WESTMINSTER

6SENG001W: Reasoning About Programs Coursework

Structured Diagrams Description

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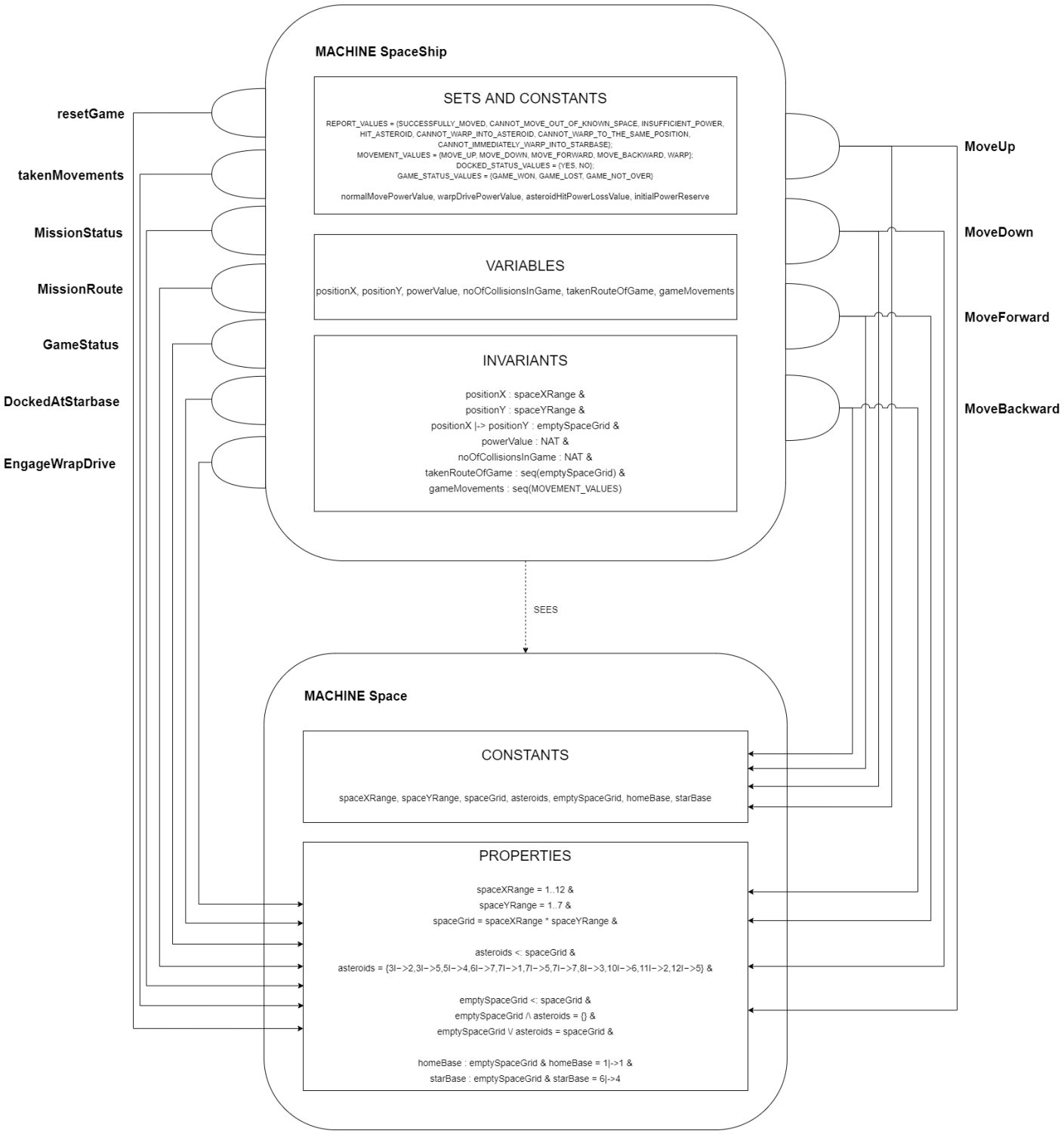
Structured Diagram for Space and Spaceship

Following diagram shows the structured diagram for the Spaceship & Asteroids Game which was built using the B tools Atelier B & ProB.



INVARIANTS in Plain English

- **`positionX : spaceXRange`**

  The type of the positionX is natural numbers which starts from number 1 to 12 in order to incorporate with the width of the space which the spaceship can move.

- **`positionY : spaceYRange`**

  The type of the positionY is natural numbers which starts from number 1 to 7 in order to incorporate with the height of the space which the spaceship can move.

- **`positionX |-> positionY : emptySpaceGrid`**

  To avoid confusion, the spaceship's location should not match or be a part of any asteroid locations.

- **`powerValue : NAT`**

  Power is needed for the spaceship to move from one region to another region. Without power spaceship cannot move to another region of space.

- **`noOfCollisionsInGame : NAT &`**

  noOfCollisionsInGame is a variable which maintains the count of the asteroid hits by the spaceship.

- **`takenRouteOfGame : seq(emptySpaceGrid)`**

  trackRouteOfGame is where the spaceship routes are recorded which has a valid move.

- **`gameMovements : seq(MOVEMENT_VALUES)`**

  gameMovements is where the spaceship routes are recorded which has a valid move.