Mars Rover Design Document

# Introduction

The purpose of this document is to outline the technical design of the mars rover application and provide an overview for the implementation

# Languages and Tools Used:

This application is implemented in core Java (version 1.8). For unit testing, Junit is being used.

and it is based on Apache maven tool for build.

# Class Diagram:

|  |  |
| --- | --- |
| ICommand | |
|  |  |
| + | run(rover : Rover) |

|  |  |
| --- | --- |
| LeftCommand | |
|  |  |
| + | run(rover : Rover) |

|  |  |
| --- | --- |
| RightCommand | |
|  |  |
| + | run(rover : Rover) |

|  |  |
| --- | --- |
| MoveCommand | |
|  |  |
| + | run(rover : Rover) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | Rover | | | - | coordinates: Coordinates | | - | direction: DirectionType | | + | upperCoordinates : Coordinates | | + | lowerCoordinates: Coordinates | | + | getCoordinates() : Coordinates | | + | setCoordinates(Coordinates) | | + | getDirection() : DirectionType | | + | setDirection(DirectionType) | | + | explore(): void | | + | toString() : String | | |  |  | | --- | --- | | Coordinates | | | - | xCordinate : int | | - | yCordinate: int | | + | getters() | | + | setters() | | + | isWithinBounds(lower: Coordinates, upper: Coordinates) : boolean | |

|  |  |
| --- | --- |
| DirectionType | |
| - | xStep: int |
| - | yStep: int |
| + | getLeft():DirectionType |
| + | getRight() : DirectionType |

|  |  |
| --- | --- |
| MarsRover | |
|  |  |
| + | landRover(initialPosition : String, commands : String) : String |
| + | Main : void |

|  |  |
| --- | --- |
| MarsRoverException | |
| - | errorCode : ErrorCodes |
| + | getErrorCode() : ErrorCodes |
| + | MarsRoverException (errorCode : ErrorCodes) |
| + | MarsRoverException (errorCode : ErrorCodes, cause : Exception) |
| + | MarsRoverException (errorCode : ErrorCodes, cause : Exception, message:String) |

|  |  |
| --- | --- |
| ErrorCodes | |
| - | errorMessage |
| + | getErrorMessage : String |

# Design Patterns:

### Command Pattern:

Command pattern is used to identify the command to execute based on type of command (L, R or M).

Type of command is wrapped under an object. E.g. L is wrapped under object of LeftCommand class and so on.

### Factory Pattern:

Factory pattern is used to create command object based on the given letter. Factory class encapsulates the object creation logic without exposing it to the Rover.

# Assumptions:

* All numbers in input are positive and within the max range of integer.
* All rovers in input have single line containing initial position and single line containing commands.