**Software Requirements and Design Document**

**For**

**Group “Riskier”**

Version 3.0

**Authors**:

Bradley Hodson

Michael Styron

Antonio Vidal

Grayson Wagstaff

Wesley Watkins

# Overview (5 points)

Riskier is a 2-D turn-based command and control game. It acts an improved edition of the classic Risk boardgame, replacing the random elements of combat in the original with a more in-depth turned based combat system which has more emphasis on player skill rather than player luck. Riskier is a standalone game that implements a central board that is sectioned off into multiple regions. Players compete with one another to control these regions by placing and moving soldiers onto the board. When two players come into conflict over a region, play switches over to a turned based combat system. Here, players can select soldiers and issue orders in order to defeat their opponent. Once a battle is resolved, play returns to the main board. The game ends when either player loses their home region.

# Functional Requirements (10 points)

Blue – High priority

Black – Medium priority

Red – Low priority

1. Title Screen:
   1. When the game is launched, the main title screen must be displayed
   2. New Game:
      1. A “New Game” button must be present on the main title screen
      2. When the button is pressed, a new game of Riskier must begin and the scene must transition to the game board
   3. Options:
      1. An “Options” button must be present on the main title screen
      2. When the button is pressed, a new options menu must be displayed to the player
      3. Difficulty:
         1. Within options, a difficulty menu must be present
         2. The difficulty menu must allow the player to choose between “easy”, “novice”, and “hard” difficulties
            1. The difficulty choice should be made via clicking buttons labelled “easy, “novice”, and “hard”
   4. Quit:
      1. A “quit game” button must be present on the main title screen
      2. When the button is pressed, the game must successfully close itself
   5. Music must play on the title screen
2. Game:
   1. Game board:
      1. When “new game” is selected from the title screen, a new game instance is created
         1. The player must be prompted to select a starting region
         2. The AI must choose a starting region after the player
            1. Starting regions must be easily identified and be displayed differently from other controlled regions
            2. If one side captures their opponent’s starting region, that side must win the game
            3. If one side loses their starting region, that side must lose the game
      2. When the player is on the game board screen, the game board must be visibly present
         1. The game board must be presented at the center of the screen
      3. The game board must consist of multiple, separate “regions”
         1. Regions must be easily distinguished from one another with clearly defined shapes and borders
         2. All regions must be connected and accessible
            1. Every region must be connected to at least one other region
            2. Regional connections must be defined as either sharing a border or having a connecting line between them
         3. Any region that has soldiers present on it must display which player owns it via a colored marking
            1. The player’s colored markings must incorporate the color green into them
            2. The AI’s colored markings must incorporate the color red into them
         4. Any region with soldiers present on it must display the number of soldiers present
            1. This numerical display must be on the colored ownership marker
   2. UI:
      1. The game board must have certain UI elements present and visible on the game board screen
      2. A “Reserve Troops” counter must be present in the upper left corner of the screen
         1. The counter is to display the number of soldiers available to the player that can be placed on the board during that turn
         2. The counter must update itself as soldiers are placed on the board during that turn
         3. The counter must update itself at the beginning of every player turn
      3. A “Moves Left” counter must be present in the upper right corner of the game board screen
         1. The counter is to display the number of move orders available to the player during their turn
         2. The counter must update itself as move orders are given during that turn
         3. The counter must update itself at the beginning of every player turn
      4. A “Place Troops” button must be present in the bottom left corner of the game board screen
         1. When pushed, the player should be allowed to place soldiers on any player-controlled region
         2. The player should only be able to place at most as many soldiers as they have available in reserve
      5. A “Move Troops” button must be present in the bottom middle of the game board screen
         1. When pushed, the player should be allowed to move a soldier from a player-controlled region into any adjacent region
         2. The player should only be allowed to make at most as many move orders as they have available in the “Moves Left” counter
      6. An “End Turn” button must be present in the bottom right corner of the game board screen
         1. When pushed, the player’s turn should end, and the AI’s turn should begin
      7. A text display must be present in the upper middle of the game board screen
         1. The text display should accurately reflect what is currently happening during a turn
            1. During the player’s turn, the text display should prompt the user for specific actions
            2. During the AI’s turn, the text display should state what the AI is currently doing
         2. The text display should change its contents when appropriate
   3. Music must play on the game board scene
3. Battle Scene:
   1. When a conflict arises on the game board, the game must transition over to the battle scene
      1. A conflict must arise on the game board when soldiers from opposing sides are present on the same region
   2. UI:
      1. The battle scene must display certain UI elements during a battle
         1. A player troop counter must be displayed in the top left corner
         2. An opponent troop counter must be displayed in the top right corner
         3. An attack button must be displayed in the bottom left corner
            1. If pressed, the player should be able to issue an attack order to one of their soldiers
         4. A defend button must be displayed close to the bottom middle
            1. If pressed, the player should be able to issue a defend order to one of their soldiers
         5. A Move troops button must be displayed in the bottom middle
            1. If pressed, the player should be able to issue a move order to one of their soldiers
         6. An end turn button must be displayed close to the bottom middle
            1. If pressed, the player’s turn must end, and the opponent’s turn begin
         7. A flee button must be displayed in the bottom right
            1. If pressed, the battle ends prematurely as the player flees
            2. If the AI attacked the player, the player should not be able to flee
   3. The battle should consist of three zones for each side
      1. Soldiers should be able to occupy the three zones
      2. The central “attack zone” must always have a soldier inside of it during the entire battle
      3. The central “attack zone” should place offensive boosts and defensive penalties to the soldier occupying it
      4. The two “support zones” should offer defensive boosts and offensive penalties to the soldier occupying it
   4. Three types of soldiers must be available to both the player and AI to use during a battle sequence
      1. A “standard soldier” must be available to use during a battle
         1. The standard soldier should have average attack, defense, and health statistics and no special abilities
      2. A “medic” must be available to use during a battle
         1. The medic should have low attack, defense, and health statistics
         2. The medic should heal itself after every turn
         3. If given the defend order, the medic should heal itself and its allies in the battle
      3. A “sniper” must be available to use during a battle
         1. The sniper should have high attack, low defense and health, and gain a bonus to attack power when in the attack position
   5. Music must play during the battle
4. Victory/Defeat
   1. When a game if finished, the player must be notified if they won or lost
      1. A player must receive the Victory screen if they achieve the game’s win conditions
      2. A player must receive the Defeat screen if the opponent achieves the win conditions
   2. A “Close game” button must be present on both Victory and Defeat screens
      1. When the button is pressed, the game window must close
5. AI:
   1. The AI must be able to take actions on the game board
      1. The AI must be able to select a starting region
      2. The AI must be able to place soldiers on the board
      3. The AI must be able to move soldiers between regions
      4. The AI must be able to end its turn
   2. The AI must be able to take actions on the battle scene
      1. The AI must be able to issue attack orders to its soldiers
      2. The AI must be able to bring in new soldiers from their reserves

# Non-functional Requirements (10 points)

1. The game must be able to run on Windows
2. The game must be stable and not crash randomly

# Use Case Diagram (10 points)

1. A player opens the game, selects New Game, and a game starts.
2. A player clicks on Options, then selects the difficulty they would like to play at.
3. At the beginning of their turn, the player gains a certain number of soldiers. They then place those soldiers on the map in any region they control.
4. During their turn, the player moves their soldiers from one of their controlled regions into an adjacent region.
5. During their turn, the player decides they want to initiate a battle with their opponent. The player moves their soldiers into an enemy-held region, then a battle begins.
6. During a battle, the player selects their own soldier and tells them to attack an enemy soldier. The enemy soldier’s HP reaches 0, and the soldier is removed from the battle.
7. During a game, the player is able to take control of the enemy’s home region. Because the player achieved their victory condition, they win and are presented with the Victory screen.

*.*

# Class Diagram and/or Sequence Diagrams (15 points)



*.*

# Operating Environment (5 points)

The game is designed to run on a Windows operating system. In order to run the game, your machine requires both python 3.7 and pip3. Once those are downloaded and installed, run “pip install -r requirements.txt”. Pip will install the dependencies. Then if you are on Windows, simply open the start.bat file. While unsupported, it is still possible to run the game on MacOS or Linux through “python main.py”.

# Assumptions and Dependencies (5 points)

1. Python 3.7
2. Pygame 1.9.6