README for RISK in OCaml

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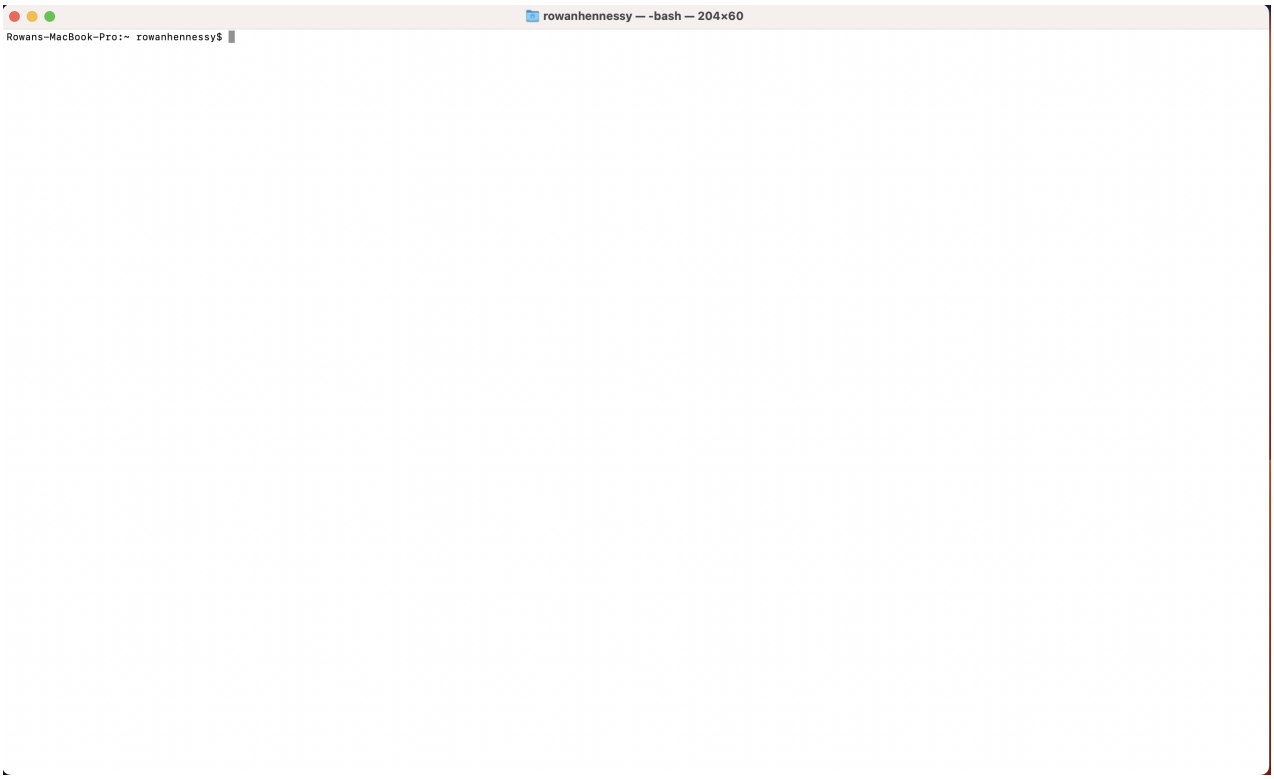
1. To begin, open a new Terminal shell and expand it to fill your screen



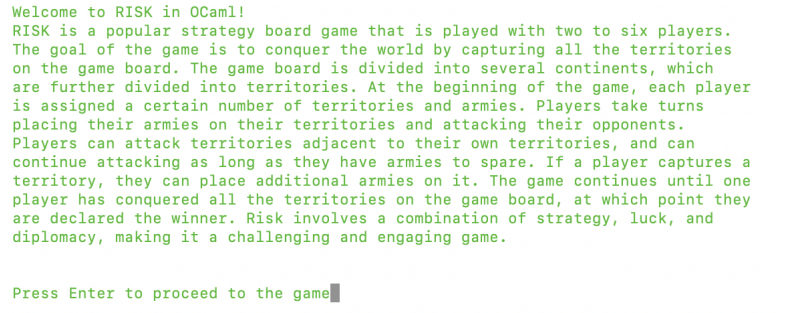
2. CD into the correct directory, as with any other project requiring make commands

```
Rowans-MacBook-Pro:~ rowanhennessy$ cd Cornell/"SP '23"/3110/"Final Project"/3110-final-project
Rowans-MacBook-Pro:3110-final-project rowanhennessy$
```

3. Run 'make play' to begin the game

```
Rowans-MacBook-Pro:3110-final-project rowanhennessy$ make play
```

4. You will be prompted with the following message giving some background on RISK:

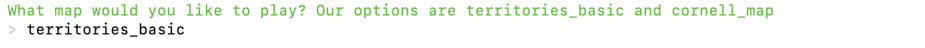


5. Hit Enter to proceed to the game! You'll see a message asking how many players you are playing with, as well as telling you to enter 'quit' at any point to quit the game.

6. Now, you enter how many players you are playing with, in the form of an ASCII Integer. However, for grading purposes entering any number from 2-6 will suffice.

7. You will then be prompted with the following message:

What map would you like to play? Our options are territories_basic and cornell_map



8. Now, decide which map you would like to play (again, for grading purposes it is a moot point but I personally prefer territories_basic)

9. You then will receive a message giving brief instructions on what is about to occur. In more elaborate terms, in the board game RISK, players begin by going around in a circle, each picking a single territory they would like to start the game with and placing one troop there, and repeating until all territories are claimed. In our version of RISK, the computer assigns all the territories to players, as we decided as a group it would be tedious and not worth the code required to do it the way it's done on a physical board.

10. After entering any value, you will see the board in it's current state, with each territory being occupied by a single troop. The color of the territory's name corresponds to the player in control of it, and the number after the comma corresponds to how many troops that person has on it. So, in the picture below, Madagascar is colored Yellow, which is Player Three's color, and has a 1 after the comma. So, Player 3 controls Madagascar and has one troop on it.

11. At the bottom, you will see a prompt asking Player 1 to put troops on a territory. This is because in RISK, after the territories have all been divided evenly among the players, each player has a certain amount of troops that they can place at any of their territories, before the main game loop begins. Enter a value for how many troops you would like to place at a territory, and watch the map update.

Note how after the player entered "3" when prompted about Ural, the map updated to show they now have 4 troops on Ural, as well as took away 3 troops from the ones they have remaining to place

12. This process repeats, moving through each player, until all the territories have been updated. It's a somewhat tedious process, but necessary for the game of RISK. For grading purposes, you may enter "0" repeatedly until finished.

13. After that is complete, the game loop will begin. Each turn, players get more troops which they may place at any of their territories. The game prompts Player 1 to do so, giving instructions on the required formatting. Territories with spaces must be delimited with underlines, for example instead of entering "South Africa 5", you must enter "South_Africa 5".

14. After Player 1 has added the troops they received, it is their turn to Attack. Player 1 can attack FROM any territory they own, and they may attack any adjacent territory. Since this is optional, the game prompts a yes or no question asking if they would like to attack. If the player enters 'No', then the game moves on to the next step. If they enter 'Yes', then the game asks WHERE they intend to attack from. After they say where they intend to attack from, the game prompts them with where they would like to attack. Note that you may not attack from any place with 1 troop, and if a territory has n troops, you are only allowed to attack with $\leq n-1$ troops. After the player enters where they would like to attack, the game asks them how many troops they would like to attack with.

15. After the player enters how many troops they would like to attack with, the game asks them to roll $1, 2,$or3 dice. This is because attacking in RISK is not a guarantee- the attacker may roll up to three dice, and the defender may roll up to 2 dice, and then the attack outcome is based on the values of these die, in a complicated set of cases not worth including here. After the attacking player enters how many die they would like to roll with, the defending player is asked how many die they would like to roll with, and the attack outcome is printed to the map.

16. After attacking, the player may fortify any single location by moving $n-1$ troops from one territory to another. This, again, is optional and the game prompts the player with another yes or no question. If they say 'No', then their turn ends and the next player's begins. If they say 'Yes', then they are asked where they would like to move troops from. After they enter that, they are asked where they would like to move troops to. Finally, they are asked how many troops they would like to move, after they enter that value their turn ends and the next player's turn begins.

17. To win, a player must conquer the entire world. That is, they must eliminate every other player from the game. However, this takes a really long time on the normal maps! So, to see the win condition easily, we made a special hidden map just for the grader. To see the win condition, use control-C to terminate the game currently going on. Then, run make play again and enter the following values in each prompt

    (a) "2"

    (b) Enter

    (c) 39

    (d) 0

    (e) (Depending on whether the game assigned Player 1 the territory Winner or Loser, the next few will change. The next instructions are written assuming Player 1 has control of Winner, but if they have control of Loser, just swap any occurrence of the two words.) Winner 3

    (f) Yes

    (g) Winner

    (h) Loser

    (i) 42

    (j) 3

    (k) 2

    This will display the game completing when one player has control of the entire map!