

# Kick-off on Risky game

## MAD - Decision Under Uncertainty

The second series of tutorials is based on a simple two players turn based strategic game **Risky**. The goal of this game is to take the control over a maximum of position, and to destroy the opponent armies.



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## Apply Q-Learning

The followed script provide a first implementation to use Q-Learning on Risky game.

- [Risky 1st Learner](#)

However, this basic implementation is slow to converge on an acceptable playing policy.

To try it, open 3 terminals, and from the hackagames directory start the server and 2 AI:

```
cd /path/to/hackagames
game-risky/hg-risky-hidden 100
```

Will wait for two players to seat on the game (connect to the server), and then run 100 games.

So in a different terminal:

```
python3 game-risky/simplePlayer.py
```

and finally in the third terminal

```
python3 gameRisky-playerQ.py
```

### To notice that:

- A Control-C in the game-server terminal would stop the game and the AIs\*\*
- The arrows on the keyboard permit users to retrieve old commands.

## Objectives

The goal of this last and open exercise is to autonomously learn the best game-policy possible by using some heuristics to drive the learning process.

At the end the students would return between 2 and 3 text file:

- A grpName-player.py in python with the code learning by playing to Risky game.
- A README.md in [Mardown syntax](#), with a sort explanation of the student strategy to converge to this grpName-player.py solution. Do not forget the developers' names at the beginning of the file.
- A qvalues.json (optional) with an export of the qvalue dictionary.

The export of the qvalue dictionary in a file allows the player to be initialized with the last learning qvalues, in order to capitalize from one learning phase to another.

```
# save a dictionary on a file:
f= open( 'qvalue.json', 'w' )
f.write( json.dump(qvalue) )
f.close()

# get a dictionary from a file:
f= open( 'qvalue.json', 'r' )
qvalue= json.loads( f.read() )
f.close()
```

**Good Luck** (and hard work)