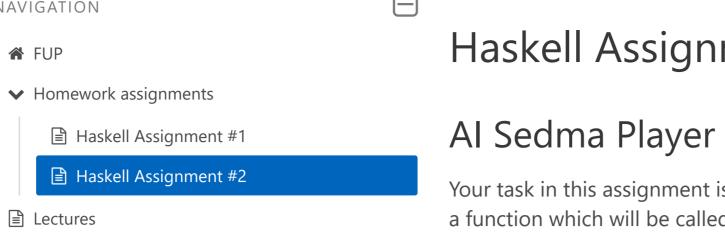


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Summer 2017 / 2018



Haskell Assignment #2

and simulating the game, is provided below.

Testing Your task in this assignment is to program a strategy for a player of Sedma. Your strategy shall be represented by **Evaluation system** a function which will be called at every round. The function should select a card to play from player's hand based on the cards which are on the current trick. Additionally, your player is allowed to maintain its inner state, where you can remember any information you like (current cards in hand, previously played cards, current score, player name, ...). In order to maintain the state, you have to provide an update function which shall be called at the end of every round. Your strategy will be used for the two players in your team (A+C or B+D) and it will be tested against other strategies. A generic Sedma engine, capable of dealing the cards

Representation

The state of a player can be an arbitrary type you design. You **must**, however, make it an instance of the following type class.

```
data Player = A | B | C | D deriving (Eq, Show)
type Trick = [Card]
class PlayerState s where
  initState :: Player -> Hand -> s
   updateState :: Trick -> Player -> Card -> Maybe Card -> s -> s
```

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Function initState will be called at the beginning of the game with the player name (A,B,C, or D) and with the initial cards in hand (always 4 cards). It should create an initial state. Function updateState will be called at the end of each round with the following arguments:

- 1. the current trick (an ordered list of 4 cards)
- 2. the leader of the current trick (the one who played the first card in this trick)
- 3. the card played by this player in this trick
- 4. the new card obtained at the end of this round (if any)
- 5. current player state.

The function should return an updated state.

A player is represented by a function of the following type AIPlayer

```
type AIPlayer s = Trick -> s -> Card
```

It takes the following arguments: (1) the current incomplete trick (from 0 to 3 cards), and (2) current player's state. It must return one of the cards currently in the hand. As the cards currently in hand are not given to your Al player, you need to remember them in your state and maintain this information via updateState.

Call your function player .

```
player :: AIPlayer YourState {- YourState implementing PlayerState -}
```

An example of a *cheating* player which always plays Heart 7 can be written as follows:

```
cheater :: AIPlayer s
cheater _ _ = Card Heart R7
```

This player is of course not a valid player and will be detected by the game engine.

Implementation

The following modules are provided and must be used unchanged.

- SedmaBase.hs contains Sedma basic types (cards, players, ..), some common functions you might use, and the above type class.
- SedmaReplay.hs is basically the solution of the previous Haskell assignment used to evaluate the winner.
- SedmaGamble.hs contains the game engine that you can use to test your player.

The most important function in SedmaGamble.hs is

```
gamble :: (PlayerState s, PlayerState t) =>
         AIPlayer s -> AIPlayer t -> Cards -> Cards
```

which takes two AI player strategies used by teams A+C and B+D. Additionally it takes an ordered (shuffled) deck of 32 cards. It simulates the game with the four players on this deck and returns the list of cards as they were played. This list can be then evaluated by function replay from the previous assignment.

Testing

For testing, you should develop a silly player, which always plays the first card from his hand. The state for this player needs only to remember the current cards in hand. Then you should develop a better player, for example, based on a simple decision tree (or a set of rules). Your player should be able to beat silly by at least n/2 points in n consecutive games with random (shuffled) decks. A player with such a performance shall be enough to reach 6 points from this assignment. For more points, you might need a better performing player.

You can download the above Haskell modules and a set of 20 testing decks in module SedmaDecks.hs. Do not submit the downloaded modules. Submit just the file implementing the function player and your state.

Evaluation system

You will be able to upload your solution to the evaluation system soon. However, the evaluation scripts will be most likely running after the weekend, when they are finished. We are sorry for the inconvenience.