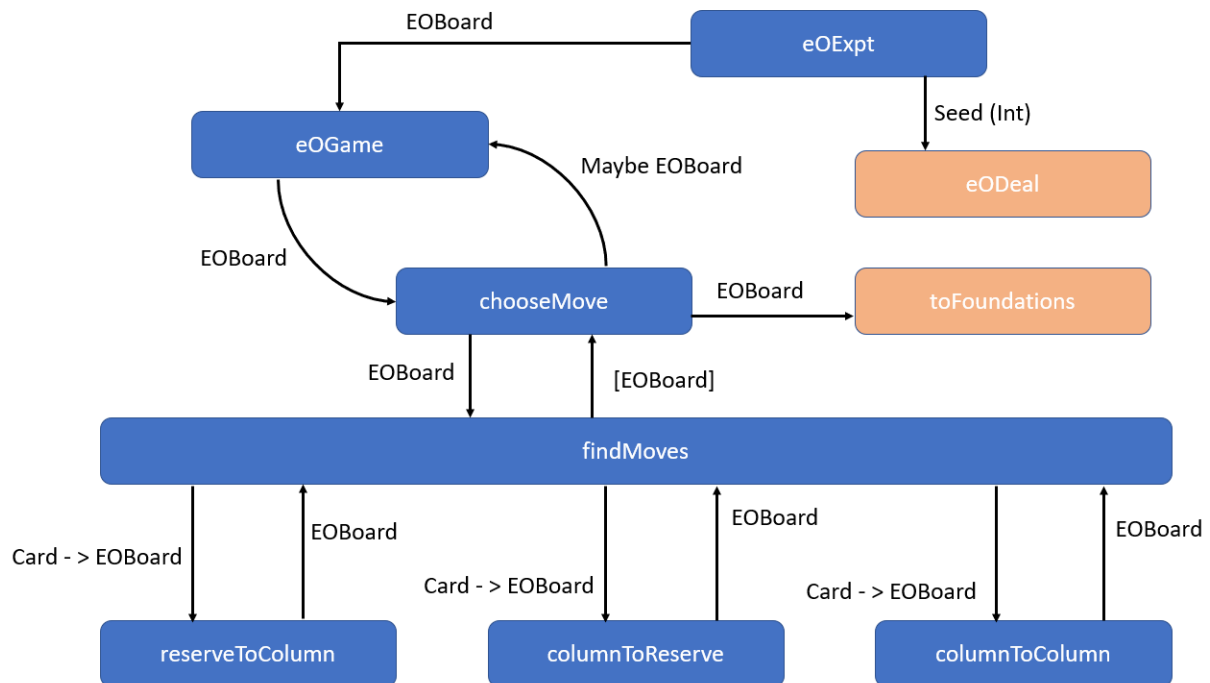


Test Results

Design



Test Results

Below is the output of findMoves when supplied with a random seed of 13 to eODeal:

```

*EOIO> displayEOBList (findMoves (toFoundations(eODeal 13)))
EOBoard
Foundations []
Columns
  [(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
  [(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
  [(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
  [(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
  [(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
  [(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
  [(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
  [(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]

Reserve [(Seven,Diamonds),(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]

-----
EOBoard
Foundations []
Columns
  [(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
  [(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
  [(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
  [(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
  [(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
  [(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
  [(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
  [(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]
  
```

```
Reserve [(Three, Clubs), (Six, Hearts), (Five, Hearts), (Ten, Spades), (Six, Clubs)]
```

```
EOBoard
Foundations  []
Columns
[(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
[(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
[(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
[(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
[(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
[(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
[(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
[(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]
```

```
Reserve [(Three,Hearts),(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]
```

```
E0Board
Foundations  []
Columns

[(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
[(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
[(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
[(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
[(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
[(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
[(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
[(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]
```

```
Reserve [(Four, Clubs), (Six, Hearts), (Five, Hearts), (Ten, Spades), (Six, Clubs)]
```

```
EOBoard
Foundations  []
Columns

[(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
[(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
[(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
[(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
[(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
[(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
[(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
[(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]
```

```
Reserve [(Two,Hearts),(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]
```

```
EOBoard
Foundations  []
Columns

[(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
[(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
[(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
[(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
[(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
[(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
[(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
[(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]
```

```
Reserve [(Six,Diamonds),(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]
```

```
EOBoard
Foundations  [ ]
Columns

[ (Seven,Diamonds), (Nine,Hearts), (Jack,Diamonds), (Jack,Spades), (Nine,Clubs), (Nine,Diamonds) ]
[ (Two,Diamonds), (Nine,Spades), (Three,Diamonds), (Eight,Diamonds), (Four,Spades), (Eight,Hearts) ]
[ (Eight,Spades), (Jack,Clubs), (Queen,Hearts), (Queen,Spades), (Five,Clubs) ]
[ (Three,Hearts), (Three,Spades), (King,Hearts), (Queen,Clubs), (Four,Hearts), (Ten,Diamonds) ]
[ (King,Diamonds), (Jack,Hearts), (Ace,Clubs), (Ten,Hearts), (King,Spades), (Five,Diamonds) ]
[ (Four,Clubs), (Eight,Clubs), (Seven,Spades), (Seven,Clubs), (Two,Spades), (Four,Diamonds) ]
[ (Two,Hearts), (Queen,Diamonds), (Seven,Hearts), (Five,Spades), (Two,Clubs), (Six,Spades) ]
[ (Six,Diamonds), (Ace,Diamonds), (King,Clubs), (Ace,Hearts), (Ten,Clubs), (Ace,Spades) ]
```

```
Reserve [(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]
```

```
EOBoard
Foundations []
Columns
    [(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
    [(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
```

```

    [(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
    [(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
    [(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
    [(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
    [(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
    [(Six,Diamonds),(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]

Reserve      [(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]

-----
EOBoard
Foundations  []
Columns
    [(Seven,Diamonds),(Nine,Hearts),(Jack,Diamonds),(Jack,Spades),(Nine,Clubs),(Nine,Diamonds)]
    [(Two,Diamonds),(Nine,Spades),(Three,Diamonds),(Eight,Diamonds),(Four,Spades),(Eight,Hearts)]
    [(Three,Clubs),(Eight,Spades),(Jack,Clubs),(Queen,Hearts),(Queen,Spades),(Five,Clubs)]
    [(Three,Hearts),(Three,Spades),(King,Hearts),(Queen,Clubs),(Four,Hearts),(Ten,Diamonds)]
    [(King,Diamonds),(Jack,Hearts),(Ace,Clubs),(Ten,Hearts),(King,Spades),(Five,Diamonds)]
    [(Four,Clubs),(Eight,Clubs),(Seven,Spades),(Seven,Clubs),(Two,Spades),(Four,Diamonds)]
    [(Two,Hearts),(Queen,Diamonds),(Seven,Hearts),(Five,Spades),(Two,Clubs),(Six,Spades)]
    [(Ace,Diamonds),(King,Clubs),(Ace,Hearts),(Ten,Clubs),(Ace,Spades)]

Reserve      [(Six,Hearts),(Five,Hearts),(Ten,Spades),(Six,Clubs)]

```

I have highlighted the cards which move during this process. As you can see, after initially starting with 4 cards in the reserves, a fifth one is appended from one of the columns. There is also some swapping between column cards. This output demonstrates that **reserveToColumn**, **columnToColumn**, **columnToReserve** and **consecCards** functions are working correctly.

Below is the output of an EOGame when supplied with a random seed of 13 to eODeal:

```

*EOIO> displayEOGame (eODeal 19)
EOBoard
Foundations  []
Columns
    [(Eight,Hearts),(Five,Diamonds),(Eight,Clubs),(Three,Hearts),(Seven,Diamonds),(Two,Diamonds)]
    [(Eight,Diamonds),(Queen,Diamonds),(Six,Clubs),(Jack,Clubs),(Seven,Hearts),(Two,Hearts)]
    [(Four,Diamonds),(Ace,Spades),(Four,Spades),(Eight,Spades),(Jack,Hearts),(King,Spades)]
    [(Queen,Clubs),(Jack,Diamonds),(Nine,Diamonds),(Three,Spades),(King,Hearts),(Seven,Spades)]
    [(King,Clubs),(Ten,Diamonds),(Three,Diamonds),(Three,Clubs),(Nine,Spades),(Seven,Clubs)]
    [(Ace,Diamonds),(Five,Spades),(Four,Hearts),(Five,Hearts),(Two,Clubs),(King,Diamonds)]
    [(Two,Spades),(Ace,Clubs),(Six,Hearts),(Ace,Hearts),(Five,Clubs),(Ten,Clubs)]
    [(Six,Spades),(Queen,Spades),(Ten,Spades),(Nine,Clubs),(Ten,Hearts),(Jack,Spades)]

Reserve      [(Queen,Hearts),(Nine,Hearts),(Four,Clubs),(Six,Diamonds)]

-----
EOBoard
Foundations  [(Ace,Diamonds)]
Columns
    [(Five,Diamonds),(Eight,Clubs),(Three,Hearts),(Seven,Diamonds),(Two,Diamonds)]
    [(Eight,Diamonds),(Queen,Diamonds),(Six,Clubs),(Jack,Clubs),(Seven,Hearts),(Two,Hearts)]
    [(Four,Diamonds),(Ace,Spades),(Four,Spades),(Eight,Spades),(Jack,Hearts),(King,Spades)]
    [(Queen,Clubs),(Jack,Diamonds),(Nine,Diamonds),(Three,Spades),(King,Hearts),(Seven,Spades)]
    [(King,Clubs),(Ten,Diamonds),(Three,Diamonds),(Three,Clubs),(Nine,Spades),(Seven,Clubs)]
    [(Five,Spades),(Four,Hearts),(Five,Hearts),(Two,Clubs),(King,Diamonds)]
    [(Two,Spades),(Ace,Clubs),(Six,Hearts),(Ace,Hearts),(Five,Clubs),(Ten,Clubs)]
    [(Six,Spades),(Queen,Spades),(Ten,Spades),(Nine,Clubs),(Ten,Hearts),(Jack,Spades)]

Reserve      [(Eight,Hearts),(Queen,Hearts),(Nine,Hearts),(Four,Clubs),(Six,Diamonds)]

-----
EOBoard
Foundations  [(Ace,Diamonds)]
Columns
    [(Five,Diamonds),(Eight,Clubs),(Three,Hearts),(Seven,Diamonds),(Two,Diamonds)]
    [(Eight,Diamonds),(Queen,Diamonds),(Six,Clubs),(Jack,Clubs),(Seven,Hearts),(Two,Hearts)]
    [(Four,Diamonds),(Ace,Spades),(Four,Spades),(Eight,Spades),(Jack,Hearts),(King,Spades)]
    [(Jack,Diamonds),(Nine,Diamonds),(Three,Spades),(King,Hearts),(Seven,Spades)]
    [(King,Clubs),(Ten,Diamonds),(Three,Diamonds),(Three,Clubs),(Nine,Spades),(Seven,Clubs)]
    [(Five,Spades),(Four,Hearts),(Five,Hearts),(Two,Clubs),(King,Diamonds)]
    [(Two,Spades),(Ace,Clubs),(Six,Hearts),(Ace,Hearts),(Five,Clubs),(Ten,Clubs)]
    [(Six,Spades),(Queen,Spades),(Ten,Spades),(Nine,Clubs),(Ten,Hearts),(Jack,Spades)]

Reserve      [(Eight,Hearts),(Queen,Hearts),(Nine,Hearts),(Four,Clubs),(Six,Diamonds)]

-----
EOBoard
Foundations  [(Ace,Diamonds)]

```

```

Columns      [(Five,Diamonds),(Eight,Clubs),(Three,Hearts),(Seven,Diamonds),(Two,Diamonds)]
              [(Eight,Diamonds),(Queen,Diamonds),(Six,Clubs),(Jack,Clubs),(Seven,Hearts),(Two,Hearts)]
              [(Four,Diamonds),(Ace,Spades),(Four,Spades),(Eight,Spades),(Jack,Hearts),(King,Spades)]
              [(Jack,Diamonds),(Nine,Diamonds),(Three,Spades),(King,Hearts),(Seven,Spades)]
              [(King,Clubs),(Ten,Diamonds),(Three,Diamonds),(Three,Clubs),(Nine,Spades),(Seven,Clubs)]
              [(Four,Hearts),(Five,Hearts),(Two,Clubs),(King,Diamonds)]
              [(Two,Spades),(Ace,Clubs),(Six,Hearts),(Ace,Hearts),(Five,Clubs),(Ten,Clubs)]
              [(Six,Spades),(Queen,Spades),(Ten,Spades),(Nine,Clubs),(Ten,Hearts),(Jack,Spades)]

Reserve      [(Eight,Hearts),(Queen,Hearts),(Nine,Hearts),(Four,Clubs),(Six,Diamonds)]

-----
EOBoard
Foundations  [(Ace,Diamonds),(Two,Spades),(Ace,Clubs)]
Columns
              [(Five,Diamonds),(Eight,Clubs),(Three,Hearts),(Seven,Diamonds),(Two,Diamonds)]
              [(Eight,Diamonds),(Queen,Diamonds),(Six,Clubs),(Jack,Clubs),(Seven,Hearts),(Two,Hearts)]
              [(Four,Spades),(Eight,Spades),(Jack,Hearts),(King,Spades)]
              [(Jack,Diamonds),(Nine,Diamonds),(Three,Spades),(King,Hearts),(Seven,Spades)]
              [(King,Clubs),(Ten,Diamonds),(Three,Diamonds),(Three,Clubs),(Nine,Spades),(Seven,Clubs)]
              [(Four,Hearts),(Five,Hearts),(Two,Clubs),(King,Diamonds)]
              [(Six,Hearts),(Ace,Hearts),(Five,Clubs),(Ten,Clubs)]
              [(Six,Spades),(Queen,Spades),(Ten,Spades),(Nine,Clubs),(Ten,Hearts),(Jack,Spades)]

Reserve      [(Eight,Hearts),(Queen,Hearts),(Nine,Hearts),(Four,Clubs),(Six,Diamonds)]

-----
"A LOSS: SCORE  7"

```

I have highlighted the movement of the cards; following this, we can see that **chooseMove** is behaving as expected and choosing legitimate moves with some degree of intelligence (moving any cards that it can to the foundation piles). I was having a lot of trouble pinpointing an empty list exception error that was not enabling me to progress through a game when a column became empty. This evidently became an issue when experimenting with my move choice algorithm as **eOExpt** returns an empty list exception when called with a random seed. Had this issue been resolved I would have been able to continue with my results (**eOGame** and **eOExpt** have both been implemented nonetheless).