
Task 6: Game Playing Interface

Abstract: In this task I finished the other half of the interface to allow two players to play a game. The focus was on allowing a human player to play against a machine opponent.

Note: Didn't add an option to condense the output yet. Also, I did not add more heuristics to play against.

Demo:

[3]> (demo--task6)

Game 1

>>> Demo for task 6 <<<

Name of human player? hu

Name of machine? m1

>>>----- Round: 1 -----<<<

--- Prize Card = (4 . HEART)

Your move, HU: 100

Sorry, illegal pick! Your move, HU: 1

--- HU's Card = (ACE . SPADE)

---Card: (ACE . SPADE)

---Card: (ACE . SPADE)

--- M1's Card = (5 . CLUB)

--- M1 won ---

--- HU Score is: 0.0

--- M1 Score is: 4.0

>>>----- Round: 2 -----<<<

--- Prize Card = (9 . HEART)

Your move, HU: 2

--- HU's Card = (2 . SPADE)

---Card: (2 . SPADE)

--- M1's Card = (JACK . CLUB)

--- M1 won ---

--- HU Score is: 0.0

--- M1 Score is: 13.0

>>>----- Round: 3 -----<<<

--- Prize Card = (QUEEN . HEART)

Your move, HU: 3

--- HU's Card = (3 . SPADE)

---Card: (3 . SPADE)

--- M1's Card = (7 . CLUB)

--- M1 won ---

--- HU Score is: 0.0

--- M1 Score is: 25.0

>>>----- Round: 4 -----<<<

--- Prize Card = (2 . HEART)

Your move, HU: 4

--- HU's Card = (4 . SPADE)

---Card: (4 . SPADE)

--- M1's Card = (4 . CLUB)

--- The round ended in a draw ---

--- HU Score is: 1.0

--- M1 Score is: 26.0

>>>----- Round: 5 -----<<<

--- Prize Card = (7 . HEART)

Your move, HU: 5

--- HU's Card = (5 . SPADE)

---Card: (5 . SPADE)

--- M1's Card = (KING . CLUB)

--- M1 won ---

--- HU Score is: 1.0

--- M1 Score is: 33.0

>>>----- Round: 6 -----<<<

--- Prize Card = (JACK . HEART)

Your move, HU: 100

Sorry, illegal pick! Your move, HU: 6

--- HU's Card = (6 . SPADE)

---Card: (6 . SPADE)

---Card: (6 . SPADE)

--- M1's Card = (ACE . CLUB)

--- HU won ---

--- HU Score is: 12.0

--- M1 Score is: 33.0

>>>----- Round: 7 -----<<<

--- Prize Card = (3 . HEART)

Your move, HU: 7

--- HU's Card = (7 . SPADE)

---Card: (7 . SPADE)

--- M1's Card = (QUEEN . CLUB)

--- M1 won ---

--- HU Score is: 12.0

--- M1 Score is: 36.0

>>>----- Round: 8 -----<<<

--- Prize Card = (10 . HEART)

Your move, HU: 8

--- HU's Card = (8 . SPADE)

---Card: (8 . SPADE)

--- M1's Card = (10 . CLUB)

--- M1 won ---

--- HU Score is: 12.0

--- M1 Score is: 46.0

>>>----- Round: 9 -----<<<

--- Prize Card = (5 . HEART)

Your move, HU: 9

--- HU's Card = (9 . SPADE)

---Card: (9 . SPADE)

--- M1's Card = (6 . CLUB)

--- HU won ---

--- HU Score is: 17.0

--- M1 Score is: 46.0

>>>----- Round: 10 -----<<<

--- Prize Card = (6 . HEART)

Your move, HU: 0

Sorry, illegal pick! Your move, HU: 10

--- HU's Card = (10 . SPADE)

---Card: (10 . SPADE)

---Card: (10 . SPADE)

--- M1's Card = (3 . CLUB)

--- HU won ---

--- HU Score is: 23.0

--- M1 Score is: 46.0

>>>----- Round: 11 -----<<<

--- Prize Card = (ACE . HEART)

Your move, HU: 11

--- HU's Card = (JACK . SPADE)

---Card: (JACK . SPADE)

--- M1's Card = (2 . CLUB)

--- HU won ---

--- HU Score is: 24.0

--- M1 Score is: 46.0

>>>----- Round: 12 -----<<<

--- Prize Card = (KING . HEART)

Your move, HU: 12

--- HU's Card = (QUEEN . SPADE)

---Card: (QUEEN . SPADE)

--- M1's Card = (8 . CLUB)

--- HU won ---

--- HU Score is: 37.0

--- M1 Score is: 46.0

>>>----- Round: 13 -----<<<

--- Prize Card = (8 . HEART)

Your move, HU: 13

--- HU's Card = (KING . SPADE)

---Card: (KING . SPADE)

--- M1's Card = (9 . CLUB)

--- HU won ---

--- HU Score is: 45.0

--- M1 Score is: 46.0

--- M1 won the game! ---

Game 2

Name of human player? Hu

Name of machine? m1

>>>----- Round: 1 -----<<<

--- Prize Card = (KING . HEART)

Your move, HU: 1

--- HU's Card = (ACE . CLUB)

---Card: (ACE . CLUB)

--- M1's Card = (KING . DIAMOND)

--- M1 won ---

--- HU Score is: 0.0

--- M1 Score is: 13.0

>>>----- Round: 2 -----<<<

--- Prize Card = (8 . HEART)

Your move, HU: 9

--- HU's Card = (9 . CLUB)

---Card: (9 . CLUB)

--- M1's Card = (8 . DIAMOND)

--- HU won ---

--- HU Score is: 8.0

--- M1 Score is: 13.0

>>>----- Round: 3 -----<<<

--- Prize Card = (5 . HEART)

Your move, HU: 6

--- HU's Card = (6 . CLUB)

---Card: (6 . CLUB)

--- M1's Card = (5 . DIAMOND)

--- HU won ---

--- HU Score is: 13.0

--- M1 Score is: 13.0

>>>----- Round: 4 -----<<<

--- Prize Card = (10 . HEART)

Your move, HU: 11

--- HU's Card = (JACK . CLUB)

---Card: (JACK . CLUB)

--- M1's Card = (10 . DIAMOND)

--- HU won ---

--- HU Score is: 23.0

--- M1 Score is: 13.0

>>>----- Round: 5 -----<<<

--- Prize Card = (QUEEN . HEART)

Your move, HU: 13

--- HU's Card = (KING . CLUB)

---Card: (KING . CLUB)

--- M1's Card = (QUEEN . DIAMOND)

--- HU won ---

--- HU Score is: 35.0

--- M1 Score is: 13.0

>>>----- Round: 6 -----<<<

--- Prize Card = (2 . HEART)

Your move, HU: 3

--- HU's Card = (3 . CLUB)

---Card: (3 . CLUB)

--- M1's Card = (2 . DIAMOND)

--- HU won ---

--- HU Score is: 37.0

--- M1 Score is: 13.0

>>>----- Round: 7 -----<<<

--- Prize Card = (3 . HEART)

Your move, HU: 4

--- HU's Card = (4 . CLUB)

---Card: (4 . CLUB)

--- M1's Card = (3 . DIAMOND)

--- HU won ---

--- HU Score is: 40.0

--- M1 Score is: 13.0

>>>----- Round: 8 -----<<<

--- Prize Card = (9 . HEART)

Your move, HU: 10

--- HU's Card = (10 . CLUB)

---Card: (10 . CLUB)

--- M1's Card = (9 . DIAMOND)

--- HU won ---

--- HU Score is: 49.0

--- M1 Score is: 13.0

>>>----- Round: 9 -----<<<

--- Prize Card = (7 . HEART)

Your move, HU: 8

--- HU's Card = (8 . CLUB)

---Card: (8 . CLUB)

--- M1's Card = (7 . DIAMOND)

--- HU won ---

--- HU Score is: 56.0

--- M1 Score is: 13.0

>>>----- Round: 10 -----<<<

--- Prize Card = (6 . HEART)

Your move, HU: 7

--- HU's Card = (7 . CLUB)

---Card: (7 . CLUB)

--- M1's Card = (6 . DIAMOND)

--- HU won ---

--- HU Score is: 62.0

--- M1 Score is: 13.0

>>>----- Round: 11 -----<<<

--- Prize Card = (ACE . HEART)

Your move, HU: 2

--- HU's Card = (2 . CLUB)

---Card: (2 . CLUB)

--- M1's Card = (ACE . DIAMOND)

--- HU won ---

--- HU Score is: 63.0

--- M1 Score is: 13.0

>>>----- Round: 12 -----<<<

--- Prize Card = (4 . HEART)

Your move, HU: 5

--- HU's Card = (5 . CLUB)

---Card: (5 . CLUB)

--- M1's Card = (4 . DIAMOND)

--- HU won ---

--- HU Score is: 67.0

--- M1 Score is: 13.0

>>>----- Round: 13 -----<<<

--- Prize Card = (JACK . HEART)

Your move, HU: 12

--- HU's Card = (QUEEN . CLUB)

---Card: (QUEEN . CLUB)

--- M1's Card = (JACK . DIAMOND)

--- HU won ---

--- HU Score is: 78.0

--- M1 Score is: 13.0

--- HU won the game! ---

Game 3

Name of human player? Hu

Name of machine? m1

>>>----- Round: 1 -----<<<

--- Prize Card = (ACE . SPADE)

Your move, HU: 1

--- HU's Card = (ACE . CLUB)

---Card: (ACE . CLUB)

--- M1's Card = (ACE . HEART)

--- The round ended in a draw ---

--- HU Score is: 0.5

--- M1 Score is: 0.5

>>>----- Round: 2 -----<<<

--- Prize Card = (8 . SPADE)

Your move, HU: 8

--- HU's Card = (8 . CLUB)

---Card: (8 . CLUB)

--- M1's Card = (8 . HEART)

--- The round ended in a draw ---

--- HU Score is: 4.5

--- M1 Score is: 4.5

>>>----- Round: 3 -----<<<

--- Prize Card = (KING . SPADE)

Your move, HU: 13

--- HU's Card = (KING . CLUB)

---Card: (KING . CLUB)

--- M1's Card = (KING . HEART)

--- The round ended in a draw ---

--- HU Score is: 11.0

--- M1 Score is: 11.0

>>>----- Round: 4 -----<<<

--- Prize Card = (2 . SPADE)

Your move, HU: 2

--- HU's Card = (2 . CLUB)

---Card: (2 . CLUB)

--- M1's Card = (2 . HEART)

--- The round ended in a draw ---

--- HU Score is: 12.0

--- M1 Score is: 12.0

>>>----- Round: 5 -----<<<

--- Prize Card = (QUEEN . SPADE)

Your move, HU: 12

--- HU's Card = (QUEEN . CLUB)

---Card: (QUEEN . CLUB)

--- M1's Card = (QUEEN . HEART)

--- The round ended in a draw ---

--- HU Score is: 18.0

--- M1 Score is: 18.0

>>>----- Round: 6 -----<<<

--- Prize Card = (9 . SPADE)

Your move, HU: 9

--- HU's Card = (9 . CLUB)

---Card: (9 . CLUB)

--- M1's Card = (9 . HEART)

--- The round ended in a draw ---

--- HU Score is: 22.5

--- M1 Score is: 22.5

>>>----- Round: 7 -----<<<

--- Prize Card = (5 . SPADE)

Your move, HU: 5

--- HU's Card = (5 . CLUB)

---Card: (5 . CLUB)

--- M1's Card = (5 . HEART)

--- The round ended in a draw ---

--- HU Score is: 25.0

--- M1 Score is: 25.0

>>>----- Round: 8 -----<<<

--- Prize Card = (6 . SPADE)

Your move, HU: 6

--- HU's Card = (6 . CLUB)

---Card: (6 . CLUB)

--- M1's Card = (6 . HEART)

--- The round ended in a draw ---

--- HU Score is: 28.0

--- M1 Score is: 28.0

>>>----- Round: 9 -----<<<

--- Prize Card = (3 . SPADE)

Your move, HU: 3

--- HU's Card = (3 . CLUB)

---Card: (3 . CLUB)

--- M1's Card = (3 . HEART)

--- The round ended in a draw ---

--- HU Score is: 29.5

--- M1 Score is: 29.5

>>>----- Round: 10 -----<<<

--- Prize Card = (10 . SPADE)

Your move, HU: 10

--- HU's Card = (10 . CLUB)

---Card: (10 . CLUB)

--- M1's Card = (10 . HEART)

--- The round ended in a draw ---

--- HU Score is: 34.5

--- M1 Score is: 34.5

>>>----- Round: 11 -----<<<

--- Prize Card = (7 . SPADE)

Your move, HU: 7

--- HU's Card = (7 . CLUB)

---Card: (7 . CLUB)

--- M1's Card = (7 . HEART)

--- The round ended in a draw ---

--- HU Score is: 38.0

--- M1 Score is: 38.0

>>>----- Round: 12 -----<<<

--- Prize Card = (JACK . SPADE)

Your move, HU: 11

--- HU's Card = (JACK . CLUB)

---Card: (JACK . CLUB)

--- M1's Card = (JACK . HEART)
--- The round ended in a draw ---
--- HU Score is: 43.5
--- M1 Score is: 43.5

>>>----- Round: 13 -----<<<

--- Prize Card = (4 . SPADE)

Your move, HU: 4

--- HU's Card = (4 . CLUB)

---Card: (4 . CLUB)

--- M1's Card = (4 . HEART)

--- The round ended in a draw ---

--- HU Score is: 45.5

--- M1 Score is: 45.5

--- The game ended in a draw. ---

>>> Finished Demo for task 6 <<<

NIL

[4]>

Demo Code:

What's new?

Just code to demonstrate task 6.

```
;-----  
  
;  
  
;  
  
;  
  
; Task 6 Demo  
  
;
```

;

```
( defun demo--task6 ()  
  ( format t ">>> Demo for task 6 <<< ~%" )  
  ( setf g ( h-hm-game ) )  
  ( play g )  
  ( setf g ( h-hm-game 1 1 ) )  
  ( play g )  
  ( setf g ( h-hm-game 1 1 ) )  
  ( play g )  
  ( format t ">>> Finished Demo for task 6 <<< ~%" )  
  nil  
)
```

Player.I Code:

What's new?

-
- Created a class for a human player.
 - Added a few methods
-
- Play-card: lets the player play a card and checks for a legal pick.
 - Checks if the player selected a value between 1-13. (Value of card, short-hand i.e A for ace, K for king, etc. or the name of the card, queen, jack, 10 or ten)
 - Checks if the card picked is in the player's hand.
 - A translation function to actually pick the card.

```
( defclass human-player ( player )  
  (  
  )  
)
```



```

( defmethod play-card ( ( hp human-player ) p-card &aux card value )
  ( princ "Your move, " )
  ( prinl ( player-name hp ) )
  ( princ ": " )
  ( setf value ( read ) )
  ( if ( legalp value hp )
      ( setf card ( player-pick-card value hp ) )
      ( setf card ( repick-value hp p-card ) )
    )
  card
)

```

```

( defmethod repick-value ( ( hp human-player ) p-card &aux card )
  ( princ "Sorry, illegal pick! " )
  ( setf card ( play-card hp p-card ) )
  card
)

```

```

( defmethod legalp ( value ( p player ) )
  ( if ( valid-value-p value )
      ( value-in-hand-p value p )
      nil
    )
)

```

```

( defmethod valid-value-p ( value )
  ( cond
    ( ( or ( equal value 1 ) ( equal value 'A ) ( equal value 'Ace ) )
      t
    )
  )
)

```

```
( ( or ( equal value 2 ) ( equal value 'two ) )
  t
)
( ( or ( equal value 3 ) ( equal value 'three ) )
  t
)
( ( or ( equal value 4 ) ( equal value 'four ) )
  t
)
( ( or ( equal value 5 ) ( equal value 'five ) )
  t
)
( ( or ( equal value 6 ) ( equal value 'six ) )
  t
)
( ( or ( equal value 7 ) ( equal value 'seven ) )
  t
)
( ( or ( equal value 8 ) ( equal value 'eight ) )
  t
)
( ( or ( equal value 9 ) ( equal value 'nine ) )
  t
)
( ( or ( equal value 10 ) ( equal value 'ten ) )
  t
)
( ( or ( equal value 11 ) ( equal value 'J ) ( equal value 'Jack )
)
  t
)
```

```

    ( ( or ( equal value 12 ) ( equal value 'Q ) ( equal value 'Queen
) )
    t
    )
    ( ( or ( equal value 13 ) ( equal value 'K ) ( equal value 'King )
)
    t
    )
    ( t
      nil
    )
  )
)

```

```

( defmethod value-in-hand-p ( num ( p player ) &aux my-card bool )
  ( setf bool nil )
  ( setf my-card ( select 0 ( player-hand p ) ) )
  ( dotimes ( i ( get-cards-left ) )
    ( setf my-card ( select i ( player-hand p ) ) )
    ( if ( equal ( value-of my-card ) ( get-value-of num ) )
      ( setf bool t )
      nil
    )
  )
  bool
)

```

```

( defmethod get-value-of ( value )
  ( cond
    ( ( or ( equal value 1 ) ( equal value 'A ) ( equal value 'Ace ) )
      1
    )
  )
)

```

```
)  
( ( or ( equal value 2 ) ( equal value 'two ) )  
  2  
)  
( ( or ( equal value 3 ) ( equal value 'three ) )  
  3  
)  
( ( or ( equal value 4 ) ( equal value 'four ) )  
  4  
)  
( ( or ( equal value 5 ) ( equal value 'five ) )  
  5  
)  
( ( or ( equal value 6 ) ( equal value 'six ) )  
  6  
)  
( ( or ( equal value 7 ) ( equal value 'seven ) )  
  7  
)  
( ( or ( equal value 8 ) ( equal value 'eight ) )  
  8  
)  
( ( or ( equal value 9 ) ( equal value 'nine ) )  
  9  
)  
( ( or ( equal value 10 ) ( equal value 'ten ) )  
  10  
)  
( ( or ( equal value 11 ) ( equal value 'J ) ( equal value 'Jack )  
)
```

```

    )
    ( ( or ( equal value 12 ) ( equal value 'Q ) ( equal value 'Queen
) )
    12
    )
    ( ( or ( equal value 13 ) ( equal value 'K ) ( equal value 'King )
)
    13
    )
    ( t
      nil
    )
  )
)

```

```

( defmethod player-pick-card ( value ( p player ) &aux my-card card-
value )
  ( setf card-value ( get-value-of value ) )
  ( setf my-card ( select 0 ( player-hand p ) ) )
  ( dotimes ( i ( get-cards-left ) )
    ( setf my-card ( select i ( player-hand p ) ) )
    ( cond
      ( ( equal ( value-of my-card ) card-value )
        ( display-card my-card p )
        ( return-from player-pick-card my-card )
      )
    )
  )
)

```

What's new?

- Added optional arguments and allowed the function to take arguments to set the rules the machine will use.
- Added the function to allow a game to be played between a human and a machine.

```
( defun hm-hm-game ( &optional ( first nil ) ( second nil ) ( third nil
) ( fourth nil ) &aux player1 player2 pname p2name game )

  ( princ "Name of machine 1? " ) ( setf pname ( read ) )
  ( princ "Name of machine 2? " ) ( setf p2name ( read ) )
  ( setf player1 ( make-instance 'h-machine-player :name pname ) )
  ( setf player2 ( make-instance 'h-machine-player :name p2name ) )
  ( set-machine-player first second player1 )
  ( set-machine-player third fourth player2 )
; ( set-machine-rules player1 'hm-rule01-stg01 )
  ( setf game
    ( make-instance 'game
      :player1 player1
      :player2 player2
    )
  )
  ( init-cards game )
  game
)

( defun set-machine-player ( first second ( p player ) )
  ( cond
    ( ( and ( equal first nil ) ( equal second nil ) )
      nil
    )
    ( ( and ( equal first 1 ) ( or ( equal second nil ) ( equal second
1 ) ) ) )
```

```

        ( set-machine-rules p 'hm-rule01-stg01 )
      )
    ( t
      nil
    )
  )
)

```

```

;-----
;
; Task 6:
;
; set-up a human player and a machine to play
;
;-----

```

```

( defun h-hm-game ( &optional ( first nil ) ( second nil ) &aux player1
player2 pname p2name game )
  ( princ "Name of human player? " ) ( setf pname ( read ) )
  ( princ "Name of machine? " ) ( setf p2name ( read ) )
  ( setf player1 ( make-instance 'human-player :name pname ) )
  ( setf player2 ( make-instance 'h-machine-player :name p2name ) )
  ( set-machine-player first second player2 )
  ( setf game
    ( make-instance 'game
      :player1 player1
      :player2 player2
    )
  )
)

```

```
)  
( init-cards game )  
game  
)
```