

1 Bug Report

The program does not have any known bugs.

2 Feature Report

2.1 Missing Features

All features reported on the project description and grading rubric from the website has been successfully implemented.

2.2 Extra Features

The capture pile is sorted as mentioned in the grading rubric and it is extended so that the hand pile and layout is also sorted for ease of readability. Stacks are easily distinguishable as they are aligned on the same line as lists.

The computer strategy and user help mode, considers the stacks on the player's capture pile to give recommendation for the next move.

An additional save option is given to the user in the middle of their turn after drawing from hand and before drawing from stockpile. In this case, the card drawn from the hand is reset and the game is saved. When the game is reloaded, the user can repick the card from its hand. This reset is done because the current structure of the configuration file does not account for the game being saved in the middle of the draw. For future work, this can be extended so that the game can resume from the middle of a player's turn.

3 Data structure/Classes Description

The game is run from a single list that contains all the specification of the game. The list elements are as follows:

- 0- Round Number
- 1- Computer hand
- 2- Computer capture

- 3- Computer round score
- 4- Computer total score
- 5- User hand
- 6- User capture
- 7- User round score
- 8- User total score
- 9- Layout pile
- 10- Stock pile
- 11- Player turn

This list is passed through the program and is updated and used as required. All the card of a deck are initialized as symbols for creating a deck. No other lists except sub-lists of the main lists are used in the program.

4 Log

February 19, 2020:

- Initial design of lisp structure (30 min)
- Readings on lisp (1 hour)
- Writing code to generate cards. Not completed (1 hour)

February 21, 2020:

- Wrote and tested program to generate cards. (1 hour)
- Wrote and tested program to generate decks and shuffle it. (30 min)
- Wrote main function handler and combined it with other functions (1 hour)
- Wrote input validation function for the main handler (30 min.)

February 23, 2020:

- Read material to load from file and wrote a skeleton to load file (30 min)
- Writing function to start the game and the round. (30 min)
- Finished function to generate hands and layout to initiate the round. (30 min)
- Wrote necessary accessor functions. (30 min)
- Wrote function to display board. (30 min)
- Started function to determine first player. (30 min)

Total: 8.5 hours

February 25, 2020:

- Finished writing and testing function to determine first player. (1 hour)

February 26, 2020:

- Wrote function to determine hand draw card for computer. (1 hour)
- Material reading. (1 hour)
- Wrote function to add cards to layout based on pick (1 hour)

- Testing and debugging two functions. (1 hour)

Total: 5 hours

March 2, 2020:

- Wrote function to capture cards from the layout. (1 hour)
- Wrote function to play from stock pile. (1 hour)
- Connected the functions so that the play can be made. (30 min)
- Wrote main game loop to get a running program. User play is the same as computer play. (1 hour)
- Debugging. Display debugging completed but game strategy is not as expected. (30 min)

March 4, 2020:

- Found bug on playstockpile function, which was incorrectly updating the board. Fixed. (1 hour)
- Wrote function to calculate scores at the end of each turn. (1 hour)
- Wrote function to update total score at the end of each round. (30 min)
- Completed main game loop and round loop function. (1 hour)
- Researched and testing file IO in lisp. (1 hour)

March 5, 2020:

- Wrote serialization function. (1 hour)
- Wrote function to load from file for testing game loop. (1 hour)
- Tested game loop on config file. Found problems in update. (30 min)
- Debugging. Printed the board after every update. A weird error of random variables being updated found. (1 hour)
- Found that SUBSTITUTE function replaces every value in the list that is equal to the value we are trying to substitute. Found a fix by using keywords :start and :count. (1 hour)
- Testing on configuration file. Found problem when players have same score on consecutive match to decide first player – FIXED. (1 hour)
- Further game loop testing. Found when no match is found and a triple stack is formed, an error occurs. Fixed it by adding a condition which was missing for this case in capture function. (1 hour)
- Wrote function to save file and tested it. (1 hour)

March 6, 2020:

- Wrote function to sort piles and tested it. (1 hour)
- Wrote function to display stacks visibly on the board. (1 hour)

March 7, 2020:

- Wrote functions for displaying help mode options for user. (1 hour)
- Wrote function to get user input and stop using computer strategy for user. (1 hour)
- Wrote function to quit game. (1 hour)

March 8, 2020:

- Cleaning out debugging code. Added comments and structuring the code. (1 hour)
- Adding more documentation as per the specifications. (1 hour)
- Refactoring code. (1 hour)

March 9, 2020:

- Tested multiple cases on the program. (1 hour)
- Further refactored code. (1 hour)

- Made the ASCII GUI pretty and readable. (30 min)
- Filling out rubric and testing everything on it. (1 hour)
- Wrote the manual for the project. (1 hour)
- Made screenshots for the manual. (1 hour)

Total: 29.5 hours

FULL TOTAL: 43 hours

5 Running Instructions

The game is run by using the command “clisp goStop.lsp”. The main entry point (GoStop) is already written in the file.

6 Program Screenshots:

```

COMPUTER PLAYER
.....
SCORE: (0)
HAND:
(CJS XC 9H 9C 9D 7H 6H 5D 5H 3H)
CAPTURE:

-----LAYOUT-----
(KD)
(QS)
(JC)
(XH XD)
(8S)
(3S)
(2H)

STOCK PILE: [7DIIII...]

-----
USER PLAYER
.....
SCORE: (0)
HAND:
(KS KC KH QD JD 9S 7D 6S 3H 2C)
CAPTURE:

*****
-----
USER TURN
-----
1: PLAY TURN
2: SAVE GAME
3: HELP MODE
4: QUIT GAME
-----
3
You can create a stacked pair.
Recommended Card: KS
1: KS
2: KC
3: KH
4: QD
5: JD
6: 9S
7: 7D
8: 6S
9: 3H
10: 2C
-----
11
INVALID INPUT! Number above range.
-1
INVALID INPUT! Number below range.
js
INVALID INPUT! Number input required.
1

*****
MENU OPTIONS:
1: DRAW FROM STOCK PILE
2: SAVE & QUIT GAME
3
INVALID INPUT! Number above range.
1

.....
DRAWING FROM STOCKPILE...
PLAYER DREW: 7D
LAYOUT MATCHES: 0
POSSIBLE CAPTURES: NIL
.....

*****
-----
ROUND #1
-----
COMPUTER PLAYER
.....
SCORE: (0)
HAND:
(CJS XC 9H 9C 9D 7H 6H 5D 5H 3H)
CAPTURE:

-----LAYOUT-----
(QS)
(JC)
(XH XD)
(8S)
(7D)
(3S)
(2H)

STOCK PILE: [5DIIII...]

-----
USER PLAYER
.....
SCORE: 0
HAND:
(KC KH QD JD 9S 7D 6S 3H 2C)
CAPTURE:
(KS KD)

*****
-----
COMPUTER TURN
-----
1: PLAY TURN
2: SAVE GAME
3: QUIT GAME
-----

```

Screenshot 1: User Turn with help mode with each user input.

```

***** Welcome to the game of Go Stop *****
MENU OPTIONS:
1: START NEW GAME
2: LOAD SAVED GAME
***** ----- *****
:1

Starting new game...

-----
FIRST PLAYER: USER!
Determining Card: K
-----

*****
-----
ROUND #1
-----
COMPUTER PLAYER
.....
SCORE: (0)
HAND:
(JS XC 9H 9C 9D 7H 6H 5D 5H 3H)
CAPTURE:

-----LAYOUT-----
(KD)
(QS)
(JC)
(XH XD)
(8S)
(3S)
(2H)

STOCK PILE: [7DIIII...]
-----
USER PLAYER
.....
SCORE: (0)
HAND:
(KS KC KH QD JD 9S 7D 6S 3H 2C)
CAPTURE:

*****
-----
USER TURN
-----
1: PLAY TURN
2: SAVE GAME
3: HELP MODE
4: QUIT GAME

```

Screenshot 2: Game setup and computer's play turn.


```

***** Welcome to the game of Go Stop *****
MENU OPTIONS:
1: START NEW GAME
2: LOAD SAVED GAME
*****
:2
Loading saved game...

Enter name of config file to load game from:
2.txt

Game loaded!
Scores from previous game:
Computer Total: 0
User Total: 0

*****
-----
ROUND #1
-----
COMPUTER PLAYER
.....
SCORE: 0
HAND:
(CJH XH 9D 8H 5C 5D 4H 3C 2S 1C)
CAPTURE:
(8H 8S)

-----LAYOUT-----
(8S 8C)
(6D)
(5D 5C 5S)
(3S)
(2C)

STOCK PILE: [QHIIIIII...]
-----
USER PLAYER
.....
SCORE: 0
HAND:
(CQH 8C 7S 6H 5S 5H 4C 3D 3S 2H)
CAPTURE:
(CS QD)

*****
-----
COMPUTER TURN
-----
1: PLAY TURN
2: SAVE GAME
3: QUIT GAME
-----
2
Game saved successfully!

*****
----- Thank you for playing Go Stop! -----
*****

Starting new game...
-----
FIRST PLAYER: COMPUTER!
Determining Card: K
-----

*****
-----
ROUND #1
-----
COMPUTER PLAYER
.....
SCORE: (0)
HAND:
(KH JS XH XD 7H 7C 6C 4S 3D 1S)
CAPTURE:

-----LAYOUT-----
(KC)
(QD)
(8D)
(7C 7D)
(4D)
(3H 3S)

STOCK PILE: [KSIIIIII...]
-----
USER PLAYER
.....
SCORE: (0)
HAND:
(CJS XD 9S 9S 8S 5H 3S 3C 2D 1D)
CAPTURE:

*****
-----
COMPUTER TURN
-----
1: PLAY TURN
2: SAVE GAME
3: QUIT GAME
-----
2
Game saved successfully!

*****
----- Thank you for playing Go Stop! -----
*****

```

Screenshot 4: Loading and saving the game.

Thank you