Stats 102A - Homework 2 - Partial Output File

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To receive full credit the functions you write must pass all tests.

Partial Output file

Some portions of the solution are shown here for guidance.

```
source("solutions.R")  # edit with your file name
```

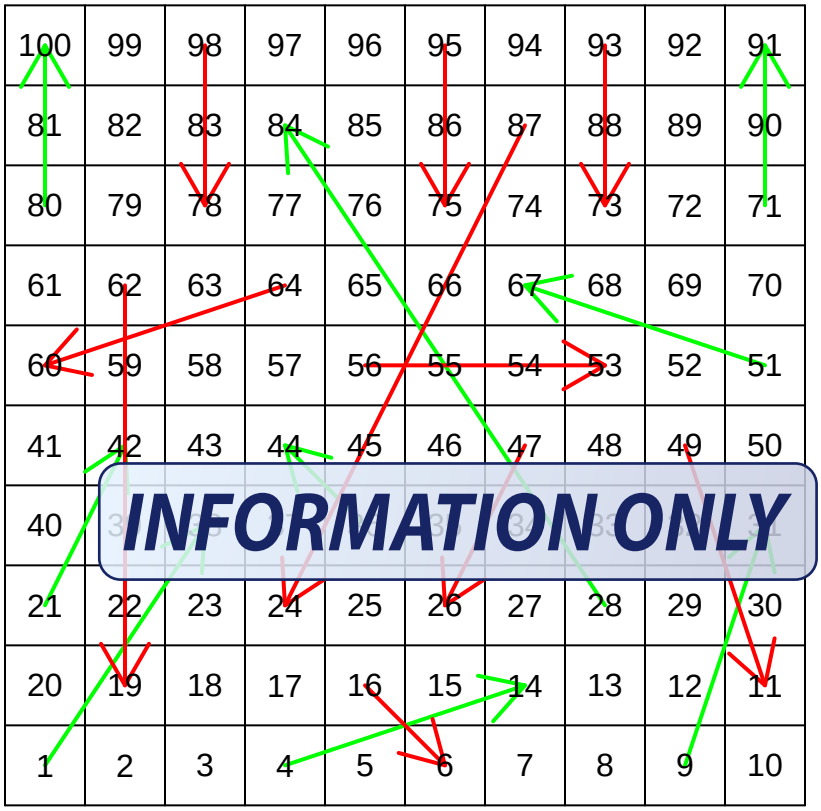
Part 1: Board representation

Create a single object called `board` where you store the features of the game board in R.

```
# answer redacted
```

Part 2: Plot of Game board

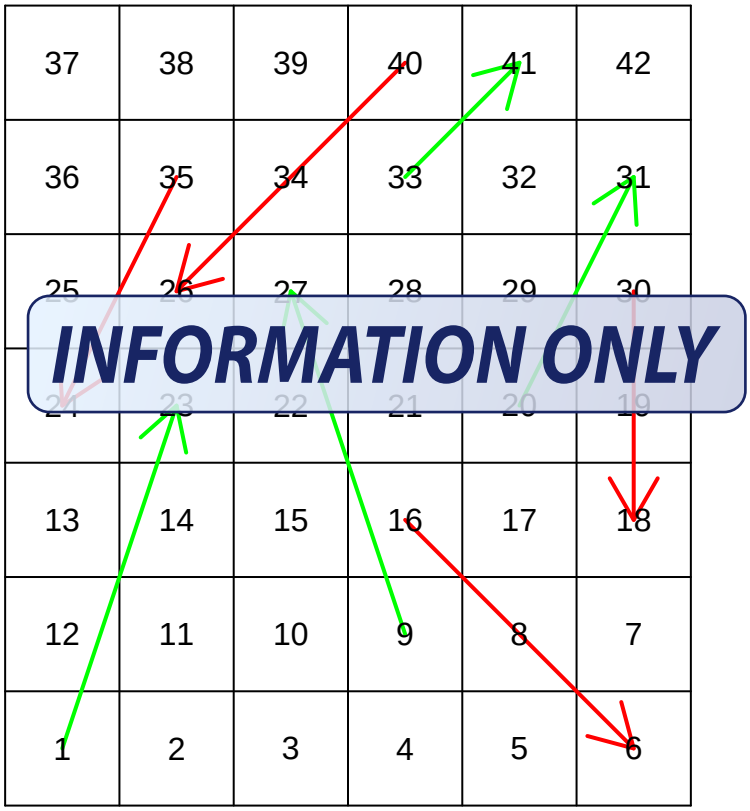
```
par(mar = c(0, 0, 0, 0))
show_board(board)
```



Part 3: Miniboard

Create the `miniboard` object and create a plot

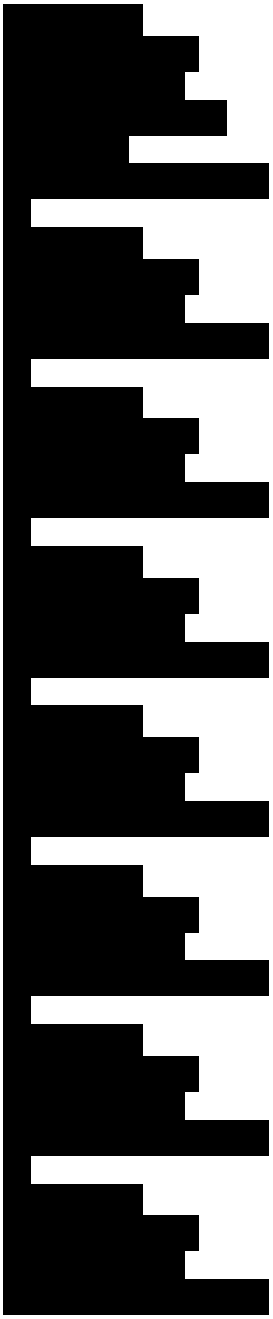
```
# miniboard representation redacted. Only one miniboard shown.
par(mar = c(0, 0, 0, 0))
show_board(miniboard)
```



Part 4: Verbose output of one single player game

```
set.seed(5)
play_solo(board, verbose = TRUE)
```

```
## Turn 1
## Start at 0
## Spinner: 2
## Turn ends at: 2
##
## Turn 2
## Start at 2
## Spinner: 3
## Turn ends at: 5
##
## Turn 3
## Start at 5
## Spinner: 1
## Turn ends at: 6
##
## Turn 4
## Start at 6
## Spinner: 3
## Landed on: 9
## Ladder!
## Turn ends at: 31
##
## Turn 5
## Start at 31
## Spinner: 1
## Turn ends at: 32
##
## Turn 6
## Start at 32
## Spinner: 1
## Turn ends at: 33
##
## Turn 7
## Start at 33
## Spinner: 5
## Turn ends at: 38
##
## Turn 8
## Start at 38
## Spinner: 6
## Turn ends at: 44
##
## Turn 9
## Start at 44
## Spinner: 3
## Landed on: 47
## Chute!
```



```
##
## Turn 28
## Start at 78
## Spinner: 2
## Landed on: 80
## Ladder!
## Turn ends at: 100

## $turns
## [1] 28
##
## $chute_tally
##  [1] 0 1 0 1 0 1 0 0 0 0
```

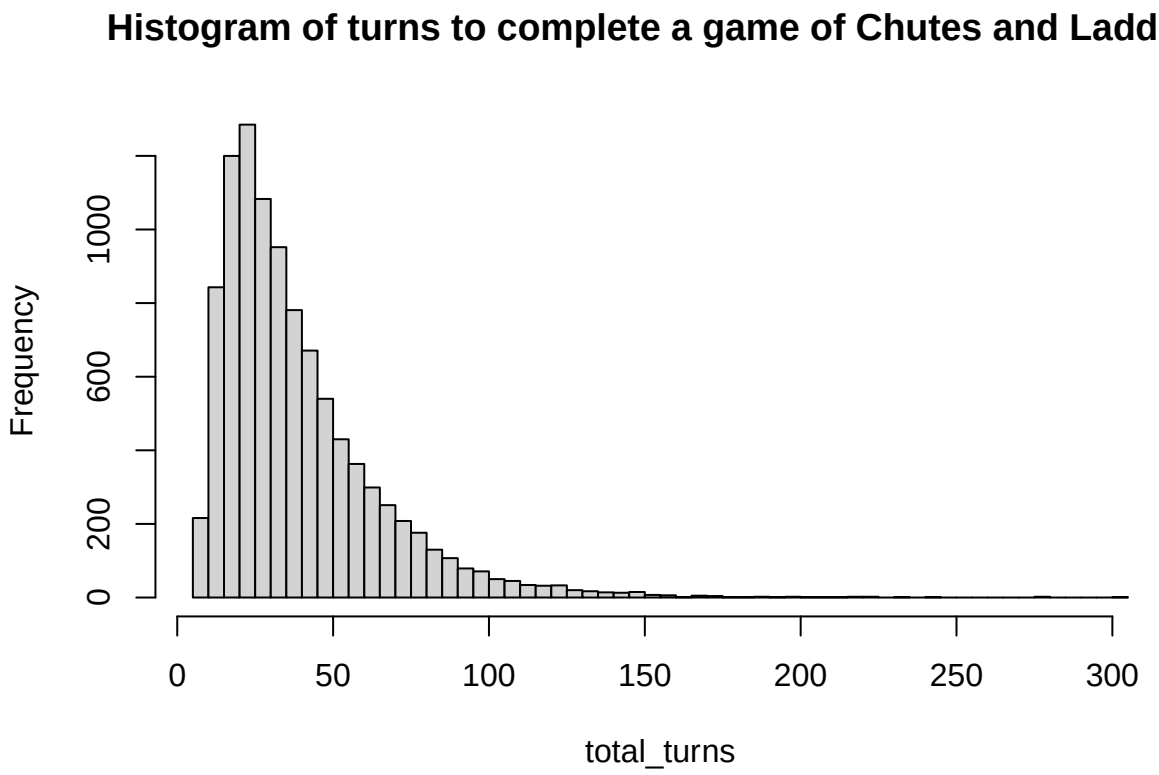
```
##
## $ladder_tally
## [1] 0 0 1 0 0 0 0 0 1
##
## $move_log
##  [1]   2   5   6  31  32  33  38  44  26  29  35  37  42  46  48  53  53  54  60
## [20]  60  63  65  70  72  74  77  78 100
```

Part 5: Monte Carlo Simulation Study

```
# run 10,000 games
# code redacted
```

- Create a histogram (breaks = 50) of the turns.

```
hist(total_turns, breaks = 50, main = "Histogram of turns to complete a game of Chutes and Ladders")
```



- Find the minimum number of turns. How many times out of 10,000 did a game finish with the minimum number of turns?

```
# this and the remaining questions are intentionally left unanswered
```

- Find the maximum number of turns.
- What is the median number of turns?
- What is the mean number of turns?
- What proportion of games take 100 or more turns to complete?
- What proportion of games take 10 or fewer turns to complete?
- What proportion of games utilize ladder 9 (the shortcut to win on space 80)?