

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
```

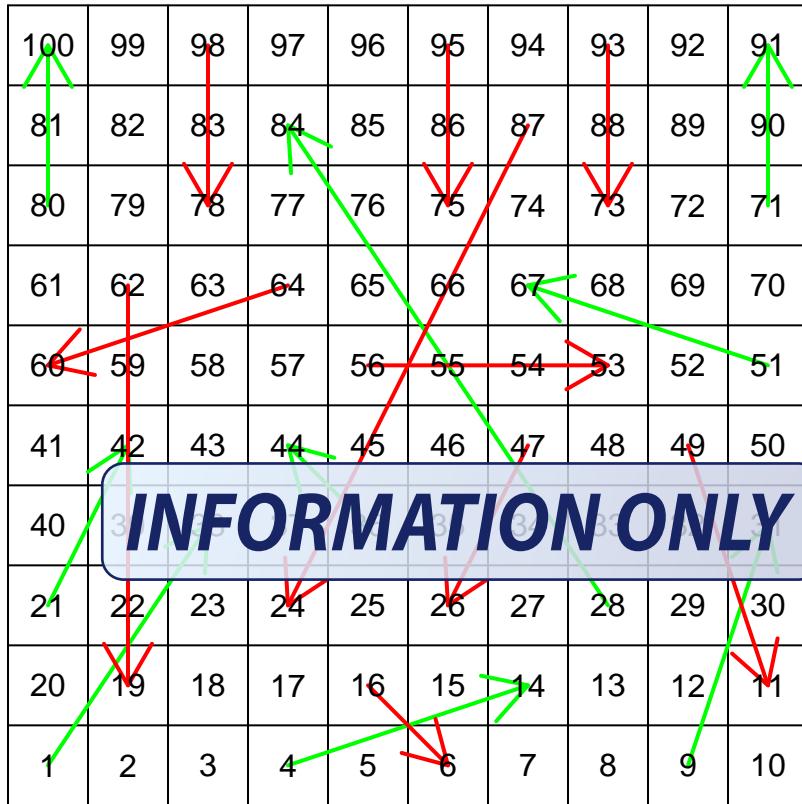
Part 1: Board representation

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)
```

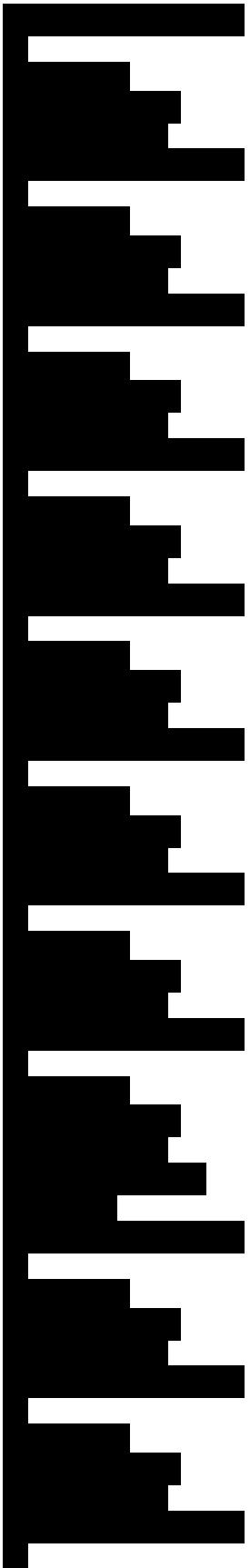
37	38	39	40	41	42
36	35	34	33	32	31
25	26	27	28	29	30
24	23	22	21	20	19
13	14	15	16	17	18
12	11	10	9	8	7
1	2	3	4	5	6

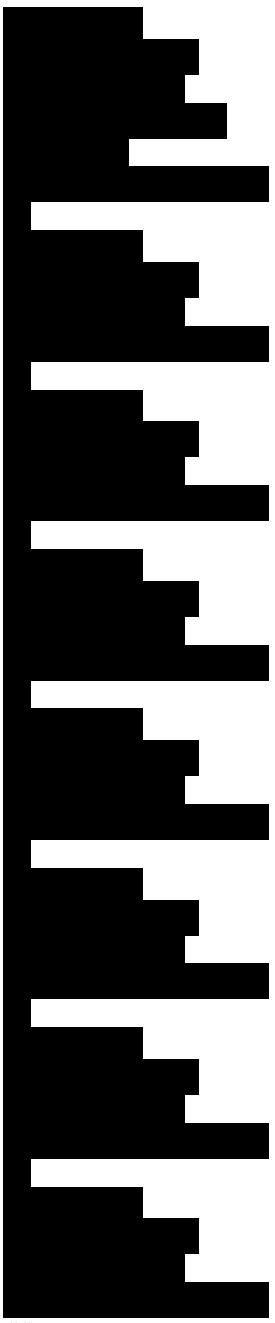
A 6x6 grid representing a miniboard. The cells contain numbers from 1 to 42. Red arrows indicate connections between cells: (25, 26) to (35), (26, 27) to (34), (27, 28) to (33), (28, 29) to (32), (29, 30) to (31), (24, 25) to (37), (23, 24) to (38), (22, 23) to (39), (21, 22) to (40), (20, 21) to (41), and (19, 20) to (42). A green arrow points from (1, 2) to (2, 3). A blue rounded rectangle labeled "INFORMATION ONLY" covers the cells (24, 25), (23, 24), (22, 23), (21, 22), (20, 21), and (19, 20).

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
```

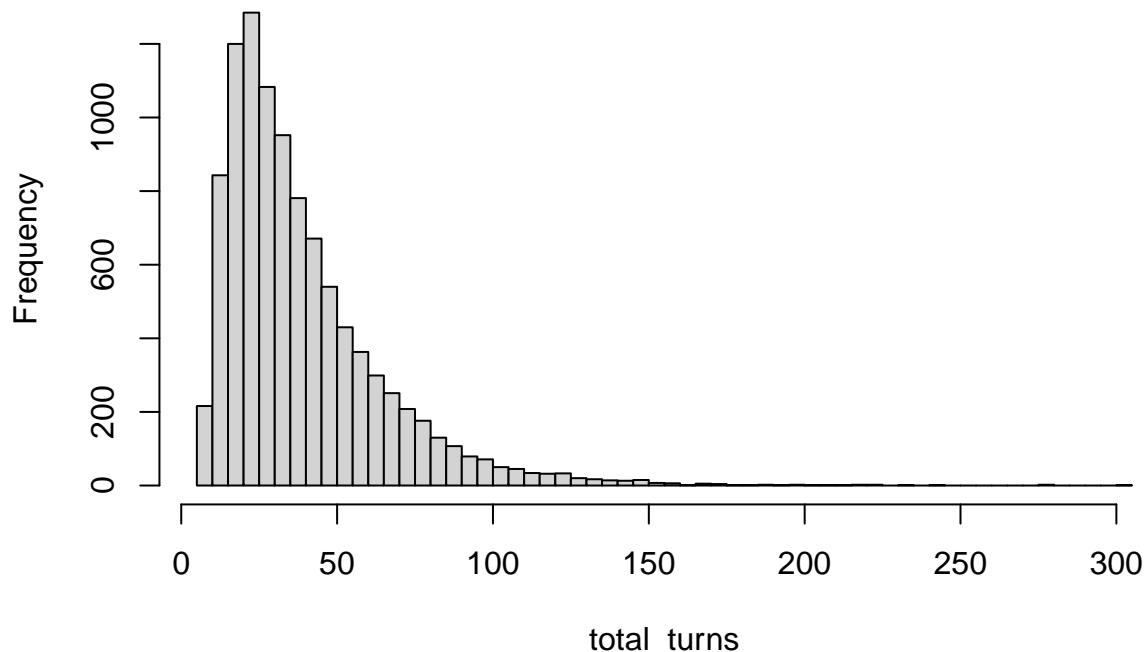
Part 5: Monte Carlo Simulation Study

```
# 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")
```

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)?