CS221 Project01 - Mancala

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INTRODUCTION

Mancala is a popular and fun game from the Mideast. It is thousands of years old, and many different versions exist. In CS221 this semester, we are going to do several different projects with this game, so I hope you like it. For this project, you will write a text version of the program that two people can play.

The game

Two players play against each other. The game board has 6 basins on each side, and two larger "scoring basins". Each player sits behind one of the long sides of the board. Each player's scoring basin is the one on her right-hand side.

At the start of the game, 5 "seeds" are placed in each small basin. Both scoring basins start empty. Player A plays first by selecting one of her own nonempty basins, picking up all the seeds inside, and moving counterclockwise, placing one seed into each following basin around in turn, until using up all the seeds.

- The player will place a seed into her own scoring basin, if she picked up enough seeds to reach it
- The player will place seeds into her opponent's nonscoring basins, if she picked up enough seeds to reach them
- The player will skip over her opponent's scoring basin and will resume placing seeds on her own side, if she is distributing enough seeds to "wrap all the way around"

A few more rules!

- If a player's last seed is placed in her own scoring basin, she gets another turn
- If a player's last seed is placed into an empty (non-scoring) basin on her own side, that seed is moved immediately to her scoring basin. And any seeds in the opponent's basin directly opposite the player's empty basin are also moved to the player's scoring basin. This is a "capture"
- Player A and Player B alternate turns until the game ends

Winning and losing

As soon as all 6 of either player's basins are empty, the game ends immediately. The other player moves all of the remaining seeds from her 6 basins to her scoring basin. Whichever player's scoring basin has more seeds is the winner.

Your program

Your program should be called mancala1.c . The program should print out a Mancala board that looks something like this:

```
      6     5     4     3     2     1
B:    5     5     5     5     5     5
0                                       0
      5     5     5     5     5     5   :A
      1     2     3     4     5     6
```

The "6 5 4 3 2 1" and "1 2 3 4 5 6" rows never change. They simply indicate the position index of each player's basins. The two "0" values are the scoring basin counts for Player B and Player A. The "5 5 5 5 5 5" rows show the starting counts for each player's basins.

Now the program prompts Player A to "make a play" i.e. to enter the index of one of her nonempty basins. The program should check player A's input for validity and should re-prompt Player A if the input is not valid. (What is a non-valid input?)

The program then uses the rules of Mancala to distribute seeds based on Player A's move. When Player A's turn is over, the program prompts Player B to play. The program continues to allow the players to play until the game ends. Then the program prints a message with the final scores for Players A and B.

```
Final score:
A: 33
B: 27
```

Some hints

You probably want to think about what data you need to store. Each player's basin totals, but also who is playing. Anything else?

You'll also want to think about what methods will be useful to you. Something to print the board? Validate user inputs? What else?

What is the most complicated part of the game? For me, it was figuring out how to implement the "capture". Do you have any ideas for that? Distribution of the seeds is a bit tricky also.

Formatting the printout

If you search online for info on the `printf()` method, you will be impressed by the huge set of features. One useful feature will help you line up the columns in your printouts. You can print a value using a specified minimum width, by giving the width between the '%' character and the type specifier. For example,

```
printf(%4d", 15)
```

prints

```
  15
```

with two spaces in front of the "15".

CONCLUSION:

Please push your program to GitHub before the project deadline. The deadline for completion of Project01 is 11:59pm Monday March 3rd.

I have no idea how difficult this project will be, so please see me or the TA's if you get stuck. My solution took about 300 lines of code, but yours may be longer or shorter.

Task	Score, points
mancala1.c compiles and runs	1
mancala1.c prints a properly formatted playing board	5
mancala1.c follows the rules of the game, runs games to their proper conclusion, and prints a correct final score	25
Software and design quality, as judged by the grader	20