Complete a system design for the Shut the Box game.

In addition to playing the game, the system should include:

- A graphical user interface for the users to play the game.
- The ability to save and reload a game from a file.
- Prompt the user for a number of players and collect their names.
- Maintain a leader board with players win totals that is saved and loaded from a file.

While you need not implement all of the variants, I have included them as a way to facilitate planning for flexibility in your design.

Deliverables – 10 points total

1) **UML Class diagram** – including all of the classes in your design. Be sure to include your classes for the user interface as well as any DAOs

2) **UML Sequence diagram** – showing the sequence for a single player’s turn.

3) **User Interface design** – include a sketch of what the user interface will look like. Identify any action listeners and their purpose that will be part of the design.
Shut the Box

From Wikipedia, the free encyclopedia

Shut the Box, is a game of dice for one or more players, commonly played in a group of two to four for stakes. Traditionally, a counting box is used with tiles numbered 1 to 9 where each can be covered with a hinged or sliding mechanism, though the game can be played with only a pair of dice, pen, and paper. Variations exist where the box has up to 10 or 12 tiles.

Rules

At the start of the game all levers or tiles are "open" (cleared, up), showing the numerals 1 to 9.

During the game, each player plays in turn. A player begins his or her turn by throwing or rolling the die or dice into the box. If the sum of the remaining tile(s) is 6 or lower, the player may roll only one die. Otherwise, the player must roll both dice.

After throwing, the player adds up the pips (dots) on the dice and then "shuts" (closes, covers) one of any combination of open numbers that equals the total number of dots showing on the dice. For example, if the total number of dots is 8, the player may choose any of the following sets of numbers (as long as all of the numbers in the set are available to be covered):

- 8
- 7, 1
- 6, 2
- 5, 3
- 5, 2, 1
- 4, 3, 1

The player then rolls the dice again, aiming to shut more numbers. The player continues throwing the dice and shutting numbers until reaching a point at which, given the results produced by the dice, the player cannot shut any more numbers. At that point, the player scores the sum of the numbers that are still uncovered. For example, if the numbers 2, 3, and 5 are still open when the player throws a one, the player's score is 10 (2 + 3 + 5 = 10). Play then passes to the next player.

For further clarification, if 2, 3, and 5 are the only numbers open, and the player throws a 4, their turn ends, since 4 requires either 4 or the pair 1, 3 to be open. With 2, 3, and 5 being the only open numbers, the only throws that would not end the player's turn are 2, 3, 5, 7, 8, and 10.

After every player has taken a turn, the player with the lowest score wins.

If a player succeeds in closing all of the numbers, he or she is said to have "Shut the Box" – the player wins immediately and the game is over.
Variants

Shut the box is a traditional game, and there are many local and traditional variations in the rules. In addition, due to the game's growing popularity, many variations of the game have developed in recent years.

The four most popular variants are:

- **Golf** – A player's score is the sum of the numbers remaining uncovered at the end of his turn. The player with the lowest score wins.
- **Missionary** – A player's score is the total number (count) of the tiles remaining uncovered at the end of his turn. For example, a player scores 3 if at the end of his turn 3 tiles remain open. The player with the lowest score wins.
- **Canoga** - a gambling variant produced by the Pacific Game Company; the company also produced a 12-tile variant, **Canoga XII**. (Canoga can also be played using a regular game set using chips.)
  1. Chips are divided evenly among all players.
  2. Players decide on an ante to place in the kitty (a half-round pocket on the playing field).
  3. Players roll to see who goes first; play then rotates clockwise.
  4. Players play a traditional round, scoring as described in "Golf" above, resulting in a winner and loser(s).
  5. Each loser pays his difference in score to the winner. For example, if the lowest (winning) score is 11, and a losing score is 15, the loser pays 4 to the winner. The winner is paid by each loser.
  6. Bonus payout: if the winner "clears the board" (scores 0 or "shuts the box"), the payout is as above but doubled, and the winner takes the kitty.
  7. If there are tied winners, total payout is either split between or among the winners or multiplied for each winner, depending on how the players agree to do this before starting the game.
- **Bakarat** - Only for 12 tile games. Standard scoring rules with two exceptions 1) Players must yell "BACKRAT!" as it is tradition before beginning each turn 2) Losing players shall receive excessive heckling from the group. Once a winner (or "King") is determined by uncovering all 12 tiles, the group must then initiate the winning ceremony. The winning ceremony consists of the following steps in order:
  1. Players silently rising and forming into a single-file line facing the King
  2. The King must primal scream whilst pouring a full beer on his/her head
  3. One-by-one, the players must proceed to hug the King and then filter back to their original seating to begin the game

**Should an existing King win again, all players automatically become "Peasants" and the King turns into "Emperor"**

The following are examples of known variations in play, setup, and scoring:

- **2 to go** – Standard game, numbers 1 to 9 up, on the first roll, the number 2 has to be dropped. If you roll 4 on your first roll, you lose.
- **3 down extreme** – numbers 1, 2 and 3 are pre dropped, leaving numbers 4 to 9 up.
- **3 to go** – The same as 2 to go but the number 3 must be dropped.
- **Lucky number 7** – The only number up is 7, and the first person to roll a 7 wins.
- **Unlucky number 7** – A standard game, when a 7 is rolled, the game stops.
- **Against all odds** – All odd numbers are up and evens down.
- **Even Stevens** – All even numbers are up and odds down.
- **Full house** – 12 numbers are up.
- **The 300** – 2 boxes and 4 dice are used, with the second box representing numbers 13 – 24. (24+23+22...2+1 = 300)
- **Thai style (Jackpot)** – Always roll two dice, but only cover one tile matching one of the dice or their sum. For example, if the dice show a 2 and a 3 you may cover one of 2, 3, or 5.
- **Digital** – A player's score at the end of the turn is the number obtained by reading the up digits as a decimal number from left to right. For example, if 1, 2, and 5 are left up the score is 125. This is also known as "Say what you see", a reference to Roy Walker's catchphrase from the TV game show Catchphrase.
- **2012** – All 12 are up, but use a 20-sided Dungeons and Dragons die rather than the pair of 6 dice: 20-sided die playing 12 numbers – 2012. This may seem a little geeky, but it adds a new level of excitement to a tired game.