

Level M1		
Java Fundamentals Course		
Session 7		
Subject Synthesis		
Duration 3 hours 30 minutes		

Part 1: Bar Management

First of all we will consider different protagonists: The Boss, the Bartender, the Waiters, the Customers, the Supplier. All are Humans, so they have some common characteristics and other specific ones, at least in the common characteristics we will have:

- A first name
- A nickname
- A wallet
- a popularity rating
- a meaningful cry

They also all have the possibility to:

- talk
- drink
- pay
- offer someone a drink
- introduce oneself

The first name should not be able to be modified, the popularity rating will only change based on certain actions carried out.

However, there are many points that differentiate them:

A Customer is a Human who has:

- A favorite drink
- A backup favorite drink (in case the bar runs out of the favorite drink)
- a level representing their blood alcohol level
- the possibility of being offered a drink
- a complementary way of presenting oneself

A Male Customer will be distinguished from a Female Customer by the color of the T-shirt for the former and the jewelry worn by the ladies (Be careful, under no circumstances should a Man be confused with a Woman). However, it will be considered that a regular Male Customer can become a Woman and vice versa. Finally, beyond a certain level of alcohol, when Customers address the Waitresses they end their sentences with a qualifier (such as "doll", "my pretty", ...) the same for Female Customers but when they address a Waiter.

The bartender is the only one who has access to the bar's stock, he does not drink anything other than non-alcoholic drinks, he does not pay for his drinks but can be offered a drink and, in certain exceptional cases if he is a regular customer who spends a lot, he can offer a drink which he pays for.

He is the only one who manages the Cash Register. He can therefore receive money from Customers and Servers, and give change. Finally, he systematically ends all his sentences with "coconut"

The Boss must be a woman because don't they say that behind every great man there is

a woman?

The boss, therefore, can be a Customer, she also has the possibility of recovering the money from the Cash Register that the Barman gives her when there is too much liquidity in it. She can also offer a drink (but in this case she has nothing to pay), order the Barman/Server to stop serving a customer who is visibly no longer in a state, finally she can exclude (temporarily of course) a customer who is resisting.

As for the Waiters/Waitresses, we will distinguish the Men from the Women by the size of the former's biceps (you need them to turn away customers) and the charm factor of the waitresses.

In any case, the Servers consume nothing but water. The Customers obviously consume more when the Waitress is charming, and offer her a drink more often. On the other hand, if it is a strong Server who takes care of them, they behave rather reasonably (unless they are popular, in which case they allow themselves to abuse a little).

The Supplier does nothing other than receive an order from a Bartender, deliver it, and get paid by the Boss.

The Bar therefore has a name (generally "At the owner's name", a Boss, staff, Customers, Tables (maximum 4 people can sit at a table), and a set of drinks offered.

Drinks can be with or without alcohol, for each alcoholic drink a number of alcohol points is considered that the Customer will ingest per glass. Each drink has a sale price and a purchase price.

For each protagonist who speaks you will start with: <Customer's first name> if it is a customer or <First name function>. When someone offers a round the Bartender exclaims "GENERAL ROUND", the Boss says "everything is fine, business is picking up", the Servers are busy in all corners and the Customers in unison express "their significant cry".

Part 2: Belote Game

In this part we will first create a deck of cards, a card is characterized by a suit (Spades, Diamonds, Clubs or Hearts) and either by a value or by a face (Jack, Queen, King, Ace). In the case of a 52-card deck the values can be between 2 and 10, in the case of a 32-card deck from 7 to 10.

Once a deck of cards is created, the cards must no longer be able to be modified (it is unthinkable that a 7 of diamonds becomes a jack of spades).

A deck of cards must be able to be mixed, reordered, cut.

To know in detail all the rules of the game, you can consult the official website of the French Belote Federation, or any other site of your convenience.

1) General

As in many card games, in belote we need a deck of 32 cards and there is an order of strength, an order of trumps and an order for announcements, so we have:

Normal power order: Ace, 10, King, Queen, Jack, 9, 8, 7

Trump suit strength order: Jack, 9, Ace, 10, King, Queen, 8, 7

Order for announcements: Ace, King, Queen, Jack, 10, 9, 8, 7

We assign points to each card according to the grid:

	Ace	10	King	Queen	Jack	9	8	7				
Off-Trump	11	10	4	3				2	0	0	0	
Asset	11	10	4	3				20	14	0	0	

There are also a number of announcements:

The tierce: 3 cards in a row in the same suit (20 points)

50: 4 consecutive cards in the same suit (50 points)

The 100: 5 consecutive cards in the same suit (100 points)

The Square: 4 identical cards (so 1 of each color)

Jacks: 200 points

New: 150 points

Ace, 10, Kings, Queens: 100 points

8 and 7: 0 points

Belote and rebelote: possess the King and Queen of trumps (20 points)

2) Progress of a game

To play belote (classic) you need 4 players divided into two teams of 2. The players of the same team are arranged face to face so that the 2 neighbors of a player are the members of the opposing team.

The deck is shuffled only before the game. To determine who deals first, each player draws a card at random; the one with the lowest card is the first dealer, the

The next dealer will be the player to the right and so on. The player to the left of the dealer cuts the deck.

The dealer deals counterclockwise 2 cards then 3 cards (or 3 then 2) finally he turns over the top one of the remaining deck and announces the color of the turned over card as a trump proposal. Each player in the direction of the distribution accepts or not the trump. If no one takes, then a second round of the table is made where each player can choose to take a trump color of his choice.

If after 2 rounds no one has taken, the cards are put back on the pile and we move on to the next dealer (we do not reshuffle but we cut the deck).

If during one of the 2 rounds a player has chosen to take trump, he then commits his team, the player then takes the turned card and the dealer continues the deal always starting with his neighbor on the right, the taker then receives 2 additional cards, the others 3. Each player therefore has 8 cards.

The player to the right of the dealer then begins to play, he places a card of his choice on the table, the following players must then follow the requested color if possible, otherwise either play a trump card or play something else depending on the case (see official rules or ask).

When all 4 players have placed a card on the table, the winning team of the trick wins the cards and scores points, the player who placed the card allowing them to win the trick becomes the new player who starts the next trick.

The team that wins the last trick has a bonus (10 de der) of 10 points.

Announcements must be made to the table at the start of the game, to be counted, the announcement must be shown during the second fold.

When the players have no more cards in hand (8 rounds), the points of the team that took trump are counted. This team must have at least 82 points (excluding announcement).

If this is the case, the announcements are counted and the total of the round is added to the score of the game (with a 90 point bonus in case of a hood). Otherwise only the opposing team scores points (160+ announcements from the opposing team).

The game ends when a team reaches a total of 1010 points.

Part 3: Tournament

Your program is now able to manage a bar (with all the different players) on the one hand, and to play belote on the other hand. From now on we will take into account the setting up of a belote tournament in the bar.

In order to set up a belote tournament, the owner first announces the tournament, the registration costs and puts up one or more registration posters in the bar.

The people who can register are: either

customers

either waiters (waitresses)

Of course it is not possible for the boss to not register, nor the bartender. And in any case there must be waiters available to serve the customers.

Players register in teams of 2 and give a name to their team, each team will have to meet all the others. A player therefore has a score representing his level at belote (beginner, novice, resourceful, average, good, expert, ...)

Once the tournament has started, registrations are closed and it should not be possible to add teams.

The bartender is responsible for the tournament score sheet. We will consider the score sheet as the example below:

ABC Teams		Total Ranking		
HAS		3 1 4		2
B 0		1	1	3
C 3 3			6	1

The team that wins a game wins 3 points, the team that loses wins no points if the score is 2 sets to 0, 1 point if the score is 2 sets to 1.

At the end of each game, the bartender will display the updated scoreboard.

At the end of each round, the players who lost buy a drink for the players of the winning team.

At the end of each game, the popularity rating of the members of the winning team increases.

At the end of the tournament, the bartender distributes 50% of the total registration fees to the winning team, the rest goes to the boss.

Remember to take into account a player's level when performing their actions.

For example: bad players play without thinking, average players count the number of trumps already dealt, good players know if they can play a card and keep their hand, experts know their partner's game, etc. It's up to you.

Obviously your program must allow the user to be a player (in this case the

game is played according to my actions) or a simple spectator (in this case the game takes place automatically, either in scrolling mode or in turn-based mode).

When the tournament is over, we must be able to obtain a summary of it: number of players, number of glasses consumed by the players during the tournament, number of decks of cards used (because there may possibly be several games taking place at the same time),

...

Be imaginative, if you think of other useful elements to add to your code, don't hesitate.

Checks

a) As you know, any good program must be documented, consider making a complete and detailed JavaDoc on each of your classes and methods as you go along.

b) Any Java program must take into account the management of error cases through exceptions, either those already natively integrated into the language, or your own personal exceptions. When an exception is caught, the user must be notified and have the necessary information to be able to correct the error. Under no circumstances should erroneous data pass through the meshes of your tests, for example if the modification of an attribute is not correct, it must not take place and the user must be notified.

User interface

This interface will have to offer the user several menus, each of which will certainly redirect to other submenus.

- We must be able to create characters (Clients, Servers, ...) either personalized or automatically.
- We must also be able to create a Tournament and register certain Players manually or automatically, a Bar,
- We must be able to obtain information about a given Player (basic information, general statistics), at the end of a tournament we must be able to know the stats of a Player for each of his matches, ...
- You can exit the program at any time.

During a tournament:

- We must be able to know all the past or future games
 - For past games we must be able to obtain the details of the game
 - For future games we should be able to launch it manually.

Conclusion

You are asked to write a report. This will contain an overall description of your program (class diagram, associated explanations), as well as for each element (class, method) an explanation of your code, if you had to make such and such a choice for the progress.

If you have any additional ideas beyond what was asked in the topics, please indicate them.

Even though it is a computer subject, I remind you that every report contains an introduction, a conclusion, transitions between the parts, a logical sequence in the development reading as well as references if some information is not yours.