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The Producer and Consumer Project

The project’s theme centers around gold miners as the producers and customers as the consumers of the gold. The gold miners are the ones that produce gold coins by mining in a gold mine. The miners will deposit their gold coins in a bank vault if there is available space in the bank vault. Only one miner or bank clerk is allowed to enter the bank vault at a time. The customers request gold coins from bank clerks. If there is gold coin in the bank vault and there are no miners or other bank clerks currently in the vault then the bank clerk will get a gold coin from the bank vault and give it to the customer for consumption. The bank clerk will make the customer wait for a gold coin if a bank clerk or miner is already in the vault.

When a bank clerk or miner leaves the bank vault the miners and bank clerks become notified that there are no bank clerks or miners in the bank vault. The miner leaves the bank vault when they have deposited the gold coin. The Bank clerk leaves the vault after taking a gold coin to give to the customer. The customers are assigned a bank clerk through the serverSocket.accept(). The bank clerk uses a method called takeGoldFromVault() to remove a gold coin from the bank vault. The miner uses the method called depositGold() to deposit a gold coin into the bank vault. The miner uses the method called takeGold() to get gold from the gold mine to make the gold coin.

Each one of the customers, bank clerks and miners is a different thread. The methods that the miners and bank clerks use to access the bank vault are synchronized, so this way only one of them can access the bank vault at a given time. Eventually the gold mine runs out of gold and the miners can no longer produce gold coins and once the last of the gold coins are consumed by the customers all the threads of the program are closed out.

Within our project folder is our source folder and this contains our Client and Server folder. The Server folder contains the Main.java file that uses the Bank.java, BankClerk.java, MinerThread.java and UserSettings.java to create the miners, bank clerks and a bank with a vault. The Main.java is a server. Within our project folder is another folder called Client and by running Main.java in that folder it will use the CustomerThread.java and UserSettings.java to create the customers and the server that allows the customers to talk to the bank clerk. For the code to work the Main.java in the Server folder should be run before running the Main.java in the Client folder. Each java file contains additional documentation for each of the methods contained in it.