Sleeping Barber Problem

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Introduction

- This program is a simulation of how to coordinate a barber and customers in a barber shop
- ▶ This program acts as a solution to the sleeping barber problem
- ▶ The barber will only cut hair when there is a customer in the shop
- ► The customer will cut their hair cut if no one else is in the shop and the barber is asleep
- Starvation and deadlock are avoided by having the barber and customer check the conditions one at a time and have them run on different threads
- The threads will sleep, notify, and wait at different times to signal different parts of the checks

Installation and setup

- Requirement: Java version 8 or higher
- In order to install this program on your own computer please copy the files from the flash drive onto wherever you wish to store them on your own system
 - ► Note: it is important to keep all files inside the same directory, especially the .jar and .bat files
 - Note: make sure folder that files are installed in does not have a space in the name (ex: folder named "folder 1" instead of "folder1") for some reason if the folder name has a space in it the .bat file has trouble running the .jar file
- Once stored where you wish, double click to run the runSleepingBarberProblem.bat file. This .bat file has the commands needed to run the program from the windows cmd

Installation and setup

- If for some reason the .bat file fails to run the program, you will need to manually run the program from the windows cmd
 - Note: (java is multiplatform, these same commands should work on linux and mac as well)
- On windows, open the cmd and change to the directory that you installed the SleepingBarberProblem.jar file in
 - ► (EX: If installed in documents, type: cd Documents/SleepingBarberProblem.jar
 - Once in the directory, run the command: java -jar SleepingBarberProblem.jar

Barber

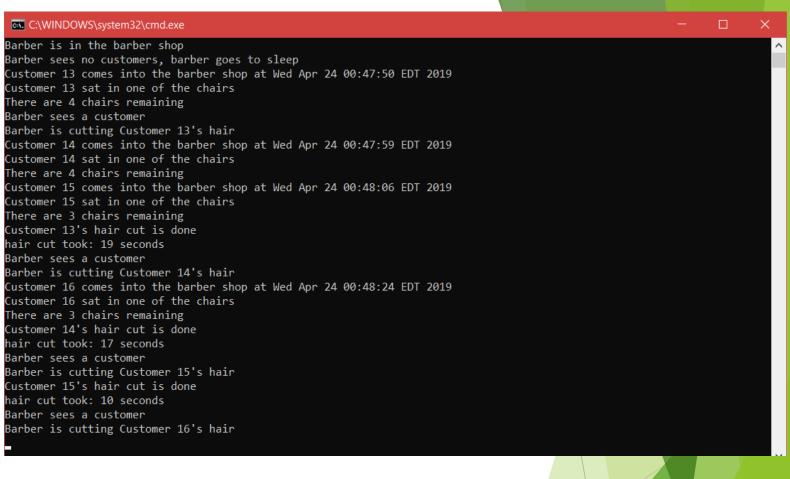
- Barber will check to see if there are any customers
 - ▶ If no customers barber will fall asleep
 - If there is a customer barber will cut their hair
 - If there is more than one customer the barber will cut in the order of arrival to the shop (first person to enter gets cut first)
- Once the barber is finished cutting hair barber will check for customers again and the process repeats
- ► This program has this process repeat in an infinite loop to simulate a constant stream of customers coming into the shop

Customer

- Customer walks into the shop and checks to see if the barber is asleep
 - ▶ If the barber is asleep the customer walks them up and they get a haircut
 - If the barber is awake and cutting another customer's hair then the customer checks to see if there are any chairs open
 - If there are chairs available the customer sits down and waits for their turn for a haircut
 - If the customer enters the shop and there are no seats available then the customer leaves

Example

Example output of the program



- Important Note: the program runs on an infinite loop to simulate a constant stream of customers coming into the shop
 - In order to stop the program once it starts running please press ctrl + c then it will ask if you want to terminate the program, enter y to exit