

## CSE1322L - Assignment 12

### **Objective:**

This week you'll explore a class of problems called producer-consumer problems. In this simple example we'll look at a restaurant where you have people cooking burgers and fries (the producers) and some customers (the consumers). The burgers & Fries will be stored in a queue (in this case implemented in an ArrayList/List).

When the restaurant opens, the fry cooks (4) and burger cooks (3) will start producing fries and burgers approximately every second. They'll do so until they've each cooked 50 fries, or 50 burgers. Simultaneously customers will start showing up asking for either burgers, fries or both randomly. We'll get to see if we have enough burgers and fries to feed everyone.

All of this will be done with threads so FryCooks, BurgerCooks and Customers can all happen simultaneously.

### **Steps:**

- Create an abstract class called Food, which has no methods or attributes.
- Create a class called Fries which is a child of Food. It doesn't need to have any attributes or methods in it.
- Create a class called Burgers which is a child of Food. It doesn't need to have any attributes or methods in it either.
- Next, create a class called BurgerCook. It will be a child of Restaurant (which you'll write in a moment). If you are in Java, it should also implement Runnable.
  - It must have an attribute called id, and a static attribute called next\_burgercook\_id which starts off as 1. As each BurgerCook object is created, it should be assigned a unique id in its constructor.
  - It must have a method called run which takes no parameters and returns void.
    - Print out "Burger cooker #x is starting to cook". Where x is their unique id.
    - Using a loop, you'll do this 50 times:
      - Print "Burger cooker #x cooked a burger"
      - Create a new Burger object
      - Add it to the madeFood arraylist/list
      - Pick a random number between 1 and 1000, sleep that long. Note: you'll use Thread.sleep(x) where x is the random number you picked. Thread.sleep must always be wrapped in a try/catch block
- Create a class called FryCook. It should be identical to Burger cook, except it says "Fry

Cook” everywhere BurgerCook says “Burger Cook”

- Create a class called Customer. It again, will be a child of Restaurant, and will implement Runnable (if you are a Java student).
  - Each customer will have a unique ID. To accomplish this, you’ll again need an id attribute, and a next\_customer\_id static attribute.
  - A Constructor will set the ID to the next\_customer\_id
  - A method called eatBurger. This method will start off by printing “Customer x wants a burger”. Then it will search the madeFood ArrayList/List looking for a burger. If it finds one, it’ll remove it from the madeFood collection. If it doesn’t find one, it’ll say “Oh no, we are out of Burgers!!!”.
  - A method called eatFries, which is identical to eatBurger, but searches for Fries and removes them. You should update the print statements to mention Fries instead of Burgers also.
  - A method called run. First the customer will need time to think about what to order, so sleep for a random time between 2 and 3 seconds. Next pick a random number between 0 and 3. If it picks zero, the customer will call eatBurger, if it picks 1, the customer will call eatBurger and eatFries, if it picks 2, the customer will call eatFries. Otherwise, the customer will not order anything.
- Next create a class called Restaurant
  - It must have a STATIC ArrayList (Java) or List (C#) of type Food called madeFood
  - It must have an ArrayList (Java) or List (C#) of Thread called workers
  - It must have an ArrayList (Java) or List (C#) of Thread called customers
  - It must have a method called open() which creates 4 FryCook threads and 3 BurgerCook threads, adds them to the workers arraylist/list and starts them.
  - It must have a method called openDoors() which creates 100 customer threads, adds them to the customers arraylist/list and starts them. After each one, it will need to pause for 50ms. Note: This can be done with a Thread.sleep(50), which must be in a try/catch block. This is to simulate the fact that all 100 customers don’t enter at once, they are hopefully spread out over time.
  - It must have a method called currentCookedFood, which counts how many burgers and how many fries are in the madeFood arraylist/list. Note you’ll need to use instanceof (java) or is (C#) to determine which type of object each cell contains. It should print “Currently we have x fries, and y burgers” where x and y are the counts.
- Finally in your main method create a restaurant called stingers.
- Open the restaurant (ie, call open)
- Print out that you have opened
- Open the doors to customers (ie, call openDoors)
- Using a loop that iterates 10 times:
  - Sleep for 1 second

- Print out the currentCookedFood() so we can see the inventory
- Finally print “We are closed”.

### **Sample Output:**

```
We are open!
Customer 1 has shown up
Burger cook # 1 is starting to cook
Fry cook # 2 is starting to cook
Burger cook # 1 cooked a burger
Fry Cook #2 cooked fries
Burger cook # 2 is starting to cook
Burger cook # 2 cooked a burger
Fry cook # 3 is starting to cook
Fry Cook #3 cooked fries
Fry cook # 4 is starting to cook
Fry Cook #4 cooked fries
Burger cook # 3 is starting to cook
Burger cook # 3 cooked a burger
Fry cook # 1 is starting to cook
Fry Cook #1 cooked fries
Customer 2 has shown up
Customer 3 has shown up
Customer 4 has shown up
Fry Cook #4 cooked fries
Customer 5 has shown up
Customer 6 has shown up
Customer 7 has shown up
Burger cook # 3 cooked a burger
Customer 8 has shown up
Fry Cook #4 cooked fries
Fry Cook #4 cooked fries
Customer 9 has shown up
Customer 10 has shown up
Burger cook # 1 cooked a burger
Customer 11 has shown up
Customer 12 has shown up
Customer 13 has shown up
Fry Cook #3 cooked fries
Customer 14 has shown up
Customer 15 has shown up
Fry Cook #1 cooked fries
Fry Cook #1 cooked fries
Fry Cook #2 cooked fries
Customer 16 has shown up
Burger cook # 2 cooked a burger
Customer 17 has shown up
Customer 18 has shown up
Customer 19 has shown up
Fry Cook #3 cooked fries
Customer 20 has shown up
Fry Cook #1 cooked fries
```

Fry Cook #1 cooked fries  
Customer 21 has shown up  
Fry Cook #2 cooked fries  
Customer 22 has shown up  
Fry Cook #1 cooked fries  
Customer 23 has shown up  
Burger cook # 1 cooked a burger  
Customer 24 has shown up  
Customer 25 has shown up  
Customer 26 has shown up  
Burger cook # 3 cooked a burger  
Customer 27 has shown up  
Fry Cook #4 cooked fries  
Customer 28 has shown up  
Customer 29 has shown up  
Customer 30 has shown up  
Customer 31 has shown up  
Burger cook # 2 cooked a burger  
Customer 32 has shown up  
Customer 33 has shown up  
Customer 34 has shown up  
Fry Cook #2 cooked fries  
Customer 35 has shown up  
Fry Cook #1 cooked fries  
Customer 36 has shown up  
Fry Cook #3 cooked fries  
Customer 37 has shown up  
Customer 38 has shown up  
Fry Cook #4 cooked fries  
Customer 39 has shown up  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Customer 40 has shown up  
Burger cook # 1 cooked a burger  
Customer 41 has shown up  
Burger cook # 3 cooked a burger  
Customer 42 has shown up  
Customer 43 has shown up  
Customer 44 has shown up  
Customer 45 has shown up  
Burger cook # 2 cooked a burger  
Customer 46 has shown up  
Customer 47 has shown up  
Customer 48 has shown up  
Customer 4 wants a burger  
Customer 4 wants fries  
Customer 3 wants a burger  
Customer 49 has shown up  
Fry Cook #4 cooked fries  
Customer 6 wants a burger  
Customer 10 wants fries  
Customer 50 has shown up

Customer 2 wants a burger  
Fry Cook #1 cooked fries  
Customer 51 has shown up  
Customer 52 has shown up  
Customer 12 wants a burger  
Customer 12 wants fries  
Customer 53 has shown up  
Customer 13 wants a burger  
Customer 54 has shown up  
Fry Cook #1 cooked fries  
Customer 55 has shown up  
Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Customer 9 wants a burger  
Customer 9 wants fries  
Customer 56 has shown up  
Customer 8 wants fries  
Customer 1 wants a burger  
Customer 1 wants fries  
Customer 57 has shown up  
Customer 5 wants a burger  
Customer 5 wants fries  
Customer 17 wants fries  
Customer 58 has shown up  
Burger cook # 1 cooked a burger  
Burger cook # 2 cooked a burger  
Customer 59 has shown up  
Burger cook # 3 cooked a burger  
Customer 60 has shown up  
Customer 18 wants fries  
Customer 14 wants a burger  
Customer 61 has shown up  
Customer 62 has shown up  
Customer 7 wants a burger  
Customer 11 wants a burger  
Customer 63 has shown up  
Burger cook # 1 cooked a burger  
Customer 15 wants fries  
Customer 24 wants fries  
Customer 64 has shown up  
Customer 21 wants a burger  
Customer 19 wants a burger  
Customer 65 has shown up  
Customer 66 has shown up  
Burger cook # 2 cooked a burger  
Customer 67 has shown up  
Fry Cook #1 cooked fries  
Fry Cook #4 cooked fries  
Customer 68 has shown up  
Fry Cook #1 cooked fries  
Customer 20 wants fries  
Customer 69 has shown up

Fry Cook #3 cooked fries  
Customer 22 wants fries  
Customer 70 has shown up  
Customer 71 has shown up  
Customer 72 has shown up  
Burger cook # 3 cooked a burger  
Burger cook # 2 cooked a burger  
Customer 16 wants a burger  
Customer 27 wants a burger  
Customer 27 wants fries  
Customer 73 has shown up  
Fry Cook #2 cooked fries  
Customer 74 has shown up  
Customer 23 wants a burger  
Customer 75 has shown up  
Customer 76 has shown up  
Customer 77 has shown up  
Customer 29 wants a burger  
Customer 78 has shown up  
Customer 38 wants a burger  
Customer 79 has shown up  
Customer 26 wants fries  
Customer 80 has shown up  
Customer 33 wants a burger  
Customer 30 wants fries  
Customer 81 has shown up  
Customer 82 has shown up  
Fry Cook #3 cooked fries  
Burger cook # 1 cooked a burger  
Customer 31 wants fries  
Burger cook # 2 cooked a burger  
Customer 39 wants fries  
Customer 42 wants a burger  
Customer 42 wants fries  
Customer 25 wants a burger  
Customer 83 has shown up  
Customer 84 has shown up  
Fry Cook #4 cooked fries  
Customer 28 wants fries  
Customer 85 has shown up  
Fry Cook #4 cooked fries  
Customer 86 has shown up  
Customer 34 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 34 wants fries  
Fry Cook #1 cooked fries  
Fry Cook #1 cooked fries  
Customer 36 wants fries  
Customer 87 has shown up  
Fry Cook #2 cooked fries  
Customer 46 wants a burger  
Oh no, we are out of Burgers!!!

Customer 88 has shown up  
Customer 49 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 49 wants fries  
Burger cook # 3 cooked a burger  
Customer 32 wants a burger  
Customer 89 has shown up  
Burger cook # 1 cooked a burger  
Customer 37 wants a burger  
Fry Cook #3 cooked fries  
Customer 43 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 90 has shown up  
Customer 91 has shown up  
Customer 92 has shown up  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Customer 93 has shown up  
Customer 35 wants a burger  
Customer 35 wants fries  
Customer 48 wants fries  
Customer 44 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 94 has shown up  
Burger cook # 3 cooked a burger  
Customer 95 has shown up  
Fry Cook #1 cooked fries  
Customer 50 wants a burger  
Customer 50 wants fries  
Customer 56 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 56 wants fries  
Customer 96 has shown up  
Burger cook # 2 cooked a burger  
Customer 97 has shown up  
Fry Cook #4 cooked fries  
Customer 98 has shown up  
Customer 41 wants a burger  
Customer 41 wants fries  
Customer 40 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 40 wants fries  
Customer 99 has shown up  
Customer 100 has shown up  
Fry Cook #3 cooked fries  
Customer 45 wants fries  
Customer 55 wants a burger  
Oh no, we are out of Burgers!!!  
Fry Cook #4 cooked fries  
Burger cook # 3 cooked a burger  
Customer 64 wants fries  
Customer 47 wants a burger

Customer 52 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 65 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 65 wants fries  
Fry Cook #1 cooked fries  
Burger cook # 1 cooked a burger  
Customer 54 wants a burger  
Customer 54 wants fries  
Customer 57 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 57 wants fries  
Customer 59 wants fries  
Fry Cook #2 cooked fries  
Customer 51 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 61 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 61 wants fries  
Customer 53 wants fries  
Customer 70 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 58 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 67 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 63 wants a burger  
Oh no, we are out of Burgers!!!  
Burger cook # 2 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Customer 69 wants a burger  
Customer 69 wants fries  
Fry Cook #2 cooked fries  
Customer 72 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 72 wants fries  
Burger cook # 2 cooked a burger  
Customer 71 wants fries  
Customer 66 wants a burger  
Customer 66 wants fries  
Customer 78 wants fries  
Burger cook # 2 cooked a burger  
Customer 73 wants fries  
Customer 60 wants a burger  
Customer 60 wants fries  
Burger cook # 3 cooked a burger  
Customer 75 wants fries  
Customer 62 wants a burger  
Currently: 4 items  
Currently have 4 fries and 0 burgers  
Customer 68 wants a burger



Oh no, we are out of Burgers!!!  
Customer 77 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 77 wants fries  
Burger cook # 1 cooked a burger  
Fry Cook #1 cooked fries  
Customer 79 wants fries  
Fry Cook #2 cooked fries  
Customer 82 wants a burger  
Burger cook # 2 cooked a burger  
Customer 83 wants a burger  
Customer 83 wants fries  
Fry Cook #3 cooked fries  
Customer 76 wants fries  
Customer 74 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 74 wants fries  
Burger cook # 3 cooked a burger  
Fry Cook #2 cooked fries  
Customer 88 wants a burger  
Customer 88 wants fries  
Customer 81 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 85 wants fries  
Fry Cook #4 cooked fries  
Customer 86 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 86 wants fries  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Customer 90 wants a burger  
Fry Cook #2 cooked fries  
Customer 94 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 94 wants fries  
Customer 80 wants fries  
Customer 84 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 87 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 87 wants fries  
Customer 92 wants a burger  
Oh no, we are out of Burgers!!!  
Fry Cook #1 cooked fries  
Currently: 1 items  
Currently have 1 fries and 0 burgers  
Burger cook # 1 cooked a burger  
Customer 93 wants a burger  
Customer 89 wants a burger  
Oh no, we are out of Burgers!!!  
Customer 95 wants fries  
Burger cook # 2 cooked a burger

Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Customer 97 wants fries  
Customer 91 wants a burger  
Customer 91 wants fries  
Oh no, we are out of Fries!!!  
Customer 100 wants fries  
Oh no, we are out of Fries!!!  
Fry Cook #3 cooked fries  
Burger cook # 3 cooked a burger  
Customer 99 wants a burger  
Customer 99 wants fries  
Fry Cook #1 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #2 cooked fries  
Customer 96 wants a burger  
Customer 96 wants fries  
Fry Cook #3 cooked fries  
Fry Cook #4 cooked fries  
Customer 98 wants a burger  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Currently: 7 items  
Currently have 4 fries and 3 burgers  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Currently: 18 items  
Currently have 11 fries and 7 burgers  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #3 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #3 cooked fries  
Currently: 30 items

Currently have 18 fries and 12 burgers

Fry Cook #3 cooked fries

Burger cook # 3 cooked a burger

Burger cook # 2 cooked a burger

Burger cook # 1 cooked a burger

Fry Cook #1 cooked fries

Burger cook # 1 cooked a burger

Burger cook # 1 cooked a burger

Burger cook # 3 cooked a burger

Burger cook # 1 cooked a burger

Fry Cook #3 cooked fries

Fry Cook #2 cooked fries

Fry Cook #4 cooked fries

Fry Cook #1 cooked fries

Fry Cook #2 cooked fries

Burger cook # 2 cooked a burger

Currently: 45 items

Currently have 25 fries and 20 burgers

Burger cook # 3 cooked a burger

Fry Cook #3 cooked fries

Fry Cook #4 cooked fries

Fry Cook #2 cooked fries

Burger cook # 2 cooked a burger

Burger cook # 1 cooked a burger

Fry Cook #2 cooked fries

Fry Cook #3 cooked fries

Fry Cook #1 cooked fries

Fry Cook #3 cooked fries

Fry Cook #4 cooked fries

Burger cook # 2 cooked a burger

Burger cook # 3 cooked a burger

Fry Cook #1 cooked fries

Fry Cook #3 cooked fries

Burger cook # 2 cooked a burger

Currently: 61 items

Currently have 35 fries and 26 burgers

Fry Cook #1 cooked fries

Fry Cook #1 cooked fries

Burger cook # 1 cooked a burger

Burger cook # 2 cooked a burger

Fry Cook #2 cooked fries

Fry Cook #1 cooked fries

Burger cook # 3 cooked a burger

Fry Cook #2 cooked fries

Fry Cook #4 cooked fries

Fry Cook #1 cooked fries

Fry Cook #3 cooked fries

Currently: 72 items

Currently have 43 fries and 29 burgers

Burger cook # 1 cooked a burger

Fry Cook #3 cooked fries

Fry Cook #2 cooked fries

Fry Cook #1 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #2 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #3 cooked fries  
Currently: 85 items  
Currently have 50 fries and 35 burgers  
Burger cook # 1 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 3 cooked a burger  
Currently: 95 items  
Currently have 56 fries and 39 burgers  
We are closed!  
Good Bye!  
Fry Cook #2 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries

Burger cook # 3 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Fry Cook #3 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #2 cooked fries  
Fry Cook #4 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #2 cooked fries  
Fry Cook #4 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #3 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 1 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #2 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 2 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #4 cooked fries

Burger cook # 2 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 3 cooked a burger  
Fry Cook #3 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 3 cooked a burger  
Burger cook # 3 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #3 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 3 cooked a burger  
Burger cook # 2 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #4 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #2 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #4 cooked fries  
Fry Cook #4 cooked fries  
Fry Cook #1 cooked fries  
Fry Cook #4 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #3 cooked fries  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger

Fry Cook #2 cooked fries  
Fry Cook #3 cooked fries  
Fry Cook #1 cooked fries  
Burger cook # 3 cooked a burger  
Burger cook # 2 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #2 cooked fries  
Burger cook # 1 cooked a burger  
Fry Cook #1 cooked fries  
Fry Cook #3 cooked fries  
Burger cook # 2 cooked a burger  
Burger cook # 2 cooked a burger  
Burger cook # 1 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 2 cooked a burger  
Fry Cook #1 cooked fries  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger  
Burger cook # 1 cooked a burger

**Note: Your output will be different each time, there are a lot of random things happening here, so you may or may not see that you run out of Fries/Burgers etc.**

## **Submission Guidelines:**

Submit your final code.

Please follow the posted submission guidelines here:

<https://ccse.kennesaw.edu/fye/submissionguidelines.php>

Ensure you submit before the deadline listed on the lab schedule for CSE1322L here:

<https://ccse.kennesaw.edu/fye/courseschedules.php>

## **Rubric:**

- Created the abstract Food class (5 points)
- Created the Burger class (5 points)
- Created the Fries class (5 points)
- Created the FryCook class (25 points total)
  - Correctly assigns a unique ID to each Fry Cook (5 points)
  - Run method (can be called something else if C#) (20 points total)
    - Correctly prints Fry Cook x is starting to cook (2 points)
    - Picks a random number up to 1000 (5 points)
    - Sleeps for that random number of milliseconds (5 points)
    - Correctly prints Fry Cook x cooked Fries (2 points)
    - Successfully creates a Fries object and adds it to the madeFood ArrayList/List (6 points)
- Created the BurgerCook class (20 points)
  - Correctly assigns unique ID to each Burger Cook (2 points)
  - Run Method (18 points total)
    - Correctly prints Burger Cook x is starting to cook (2 point)
    - Picks a random number up to 1000 and sleeps that long (8 points)
    - Correctly prints Burger Cook x cooked a Burger (2 point)
    - Successfully creates a Burger object and adds it to the madeFood ArrayList/List (6 points)
- Created the Restaurant class (33 points total)
  - Has an arraylist/list which is static called madeFood (3 points)
  - Has an arraylist/list which is not static of type Thread called workers (3 points)
  - Has an arraylist/list which is not static of type Thread called customers (2 points)
  - Has an open method (8 points total)
    - Creates 4 threads of FryCook (4 points)
    - Creates 3 threads of BurgerCook (2 points)
    - Starts all 7 threads (2 points)



- Has an openDoors method (6 points total)
  - Creates 100 threads of customers, and starts them (4 points)
  - Sleeps 50ms in between each creation (2 points)
- Has a currentlyCookedFood method (11 points total)
  - Counts how many burgers and fries we have in the madeFood arraylist/list (10 points)
  - Prints “Currently have x fries and y burgers” correctly (1 point)
- Main method (7 points total):
  - Creates a restaurant called stingers (2 points)
  - Calls open (1 point)
  - Calls openDoors (1 points)
  - Loops 10 times (3 points)
    - Each time sleeps for 1 second
    - Calls currentlyCookedFood and prints out the results