Assignment Threads - The Car Wheel System
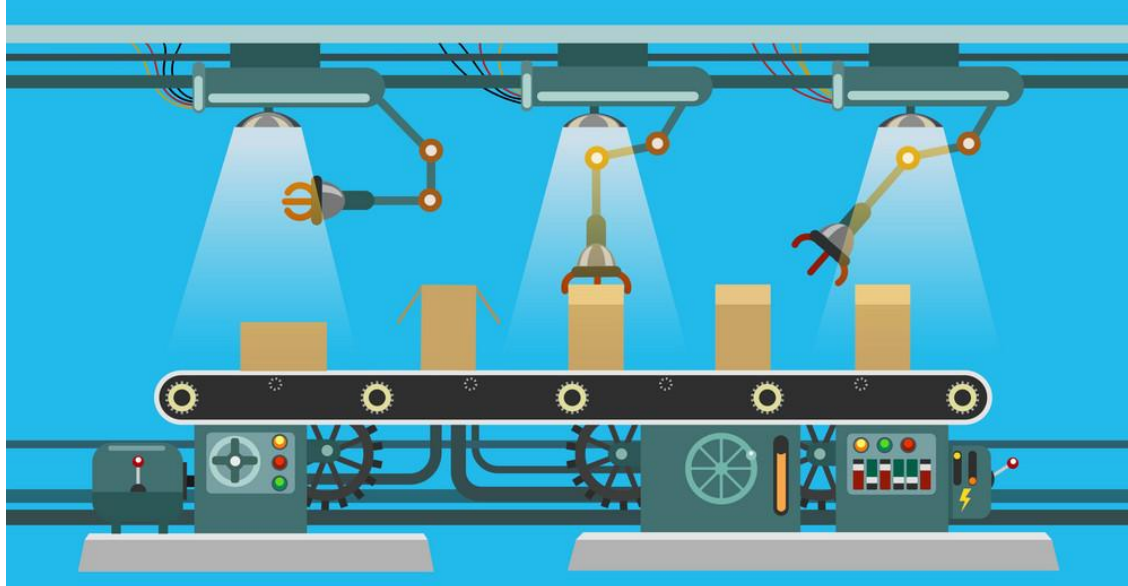
By Daniel Ellebæk

The Car wheel System

Main description

Imagine a factory that creates car wheels. Inside there are 4 conveyor belts

that can work at any time.

Main description

Each conveyor belt run for exactly 10 seconds and spends another 2 seconds to prepare for a new run.

Each run create one car wheel. So that means every 10 seconds the factory produce 4 car wheels.

A conveyor belt is allowed to stop if there is a problem. (see next page for cleaning procedures)

Cleaning Procedures

When a conveyor belt finished 10 car wheels it needs to stop for 6 seconds.

This is also the cleaning process of the conveyor belt.

Car Wheel specifications

There are 3 kind of car wheels the factory can produce. The main description specifies that every 10 seconds one car wheel is produced. There are however 3 different wheels. Here are the productionspefications for wheels:

1. Normal car wheel - 10 seconds production time
2. Winter car wheel - 14 seconds production time
3. High quality car wheel - 17 seconds production time

Production queue

The factory has a production queue which acts as a future task distributor for the conveyor belts.

The production queue works on the FIFO concept which is illustrated in the figure below.

Queue:

First in, first out
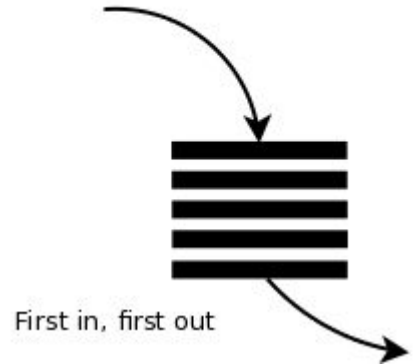
Technical Requirements

Each conveyor belt is a thread.

The production queue is a data structure. You are allowed to create your own or use one from Java´s implementation.

From a menu running parallel with all other operations you should able to push one of the three car wheels to the production queue in any number or order.

Code requirements

The "static void main" method most be used for initialization the general startup object.

You are not allowed to have long if/else if and/or switch/case statements.

You must apply some sort of structure to your code that divides business logic and visual representation models.

You must use POJO objects to share and/or carry your data from object to object.

Restrict the amount of raw variable types you have to your methods e.g. int, string, long, float, etc.

Tests

While testing the system for about 2-3 minutes time you must specific these three goals.

1. What did you learn?
2. How much time did you put into "what you learned"?
3. What could have been better in your system?

Group Assignment

Groups of 2-4 people