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## Programing 2

### Producer\_consumer report

Video link :-

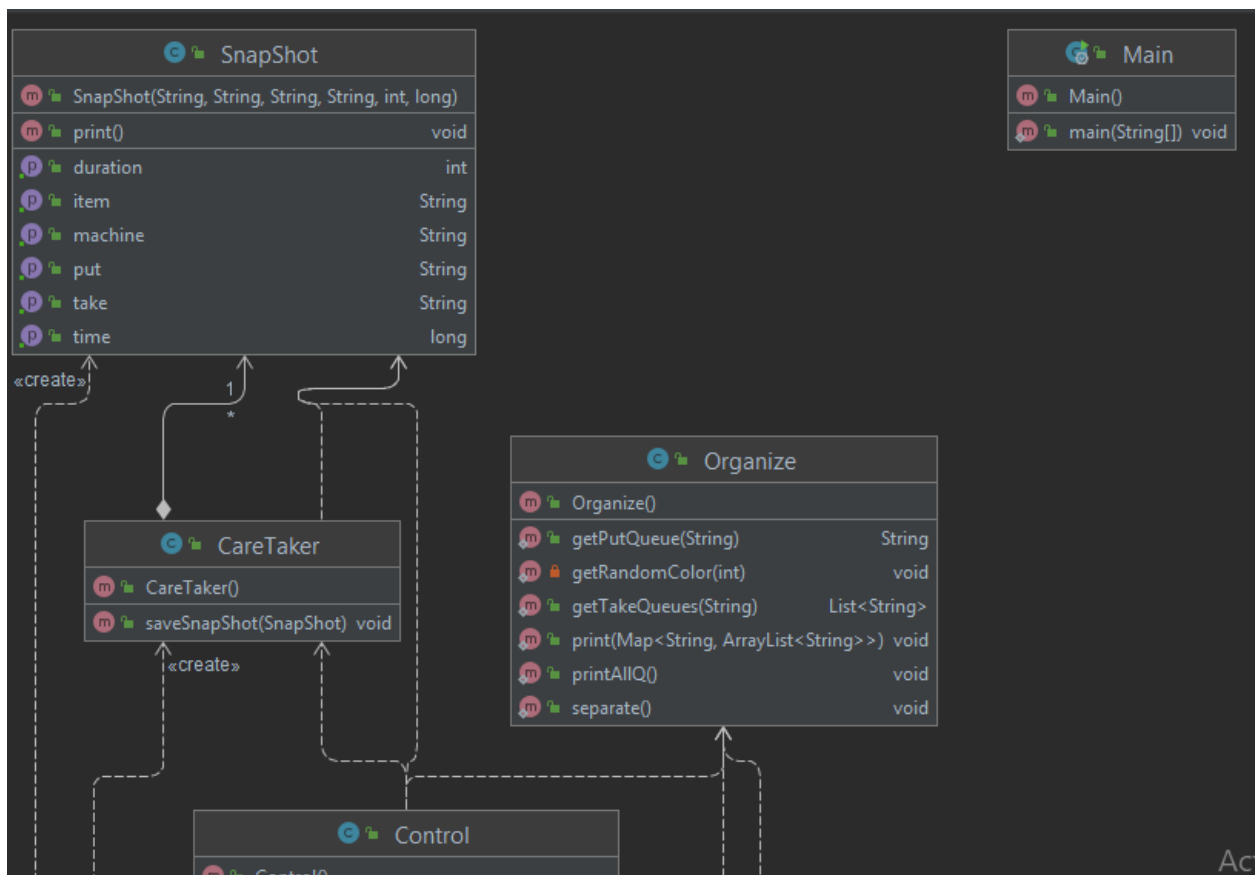
[https://drive.google.com/drive/folders/1oeWC\\_SnP28UHXUPrZU68hazPOPkVF6dr?usp=sharing](https://drive.google.com/drive/folders/1oeWC_SnP28UHXUPrZU68hazPOPkVF6dr?usp=sharing)

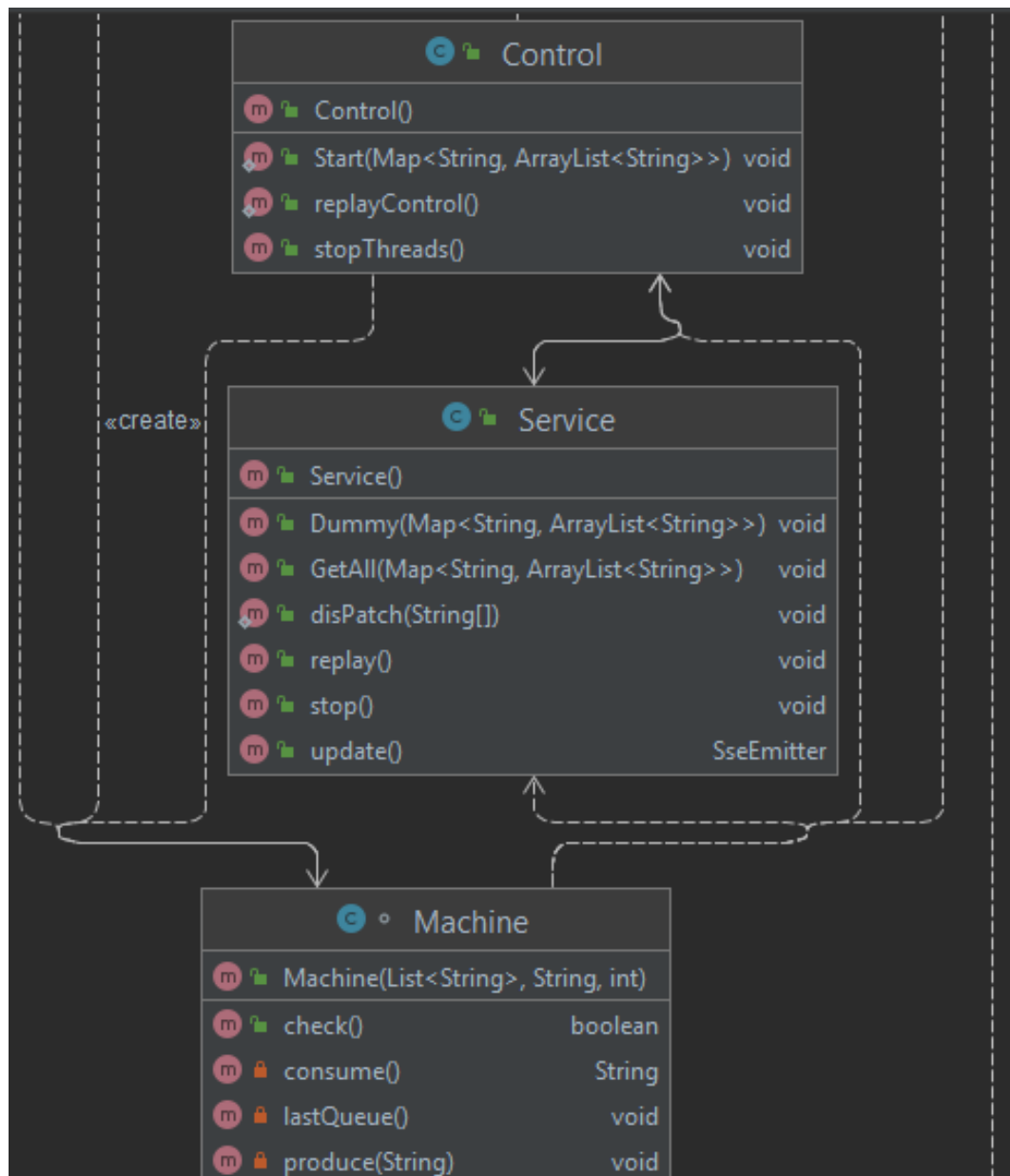
- **Description of a full list of the steps required to run your code.**

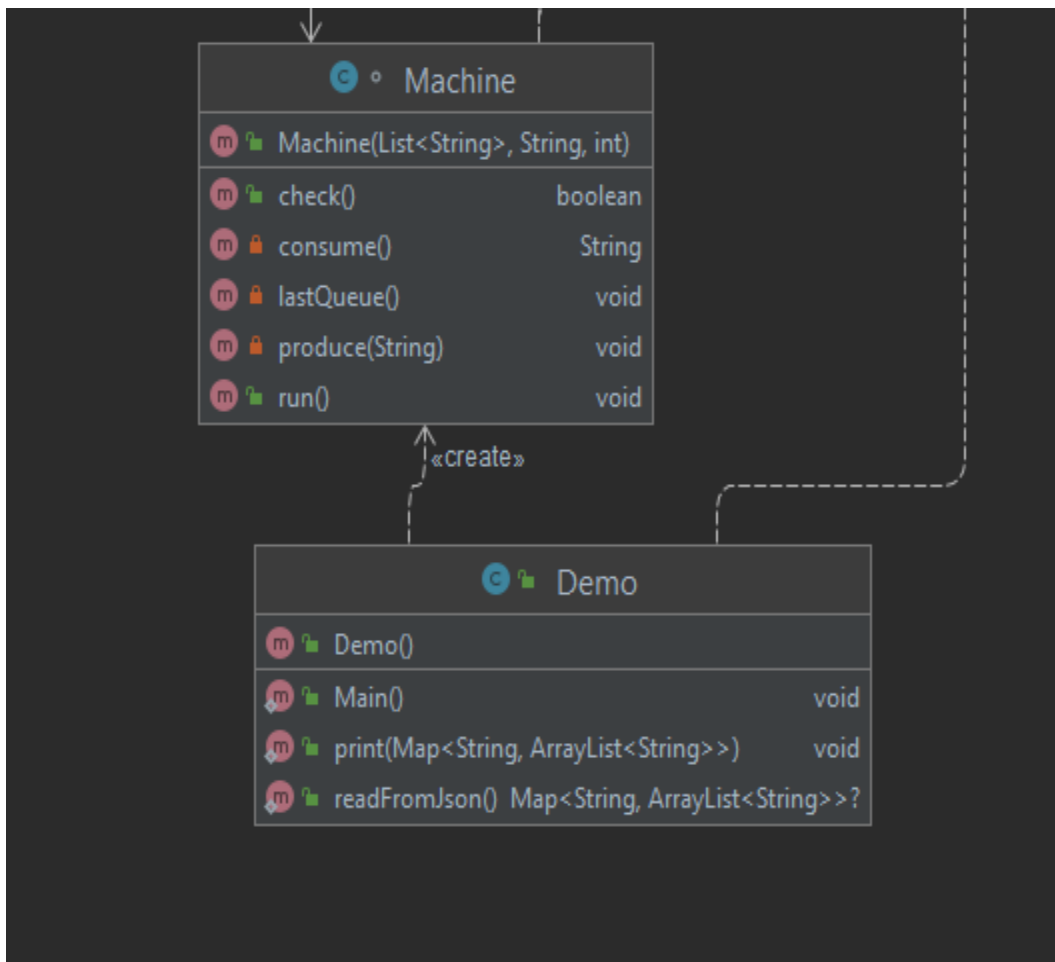
- 1- Run the server of the front-end at port "4200" for example  
Type "ng s" in your cmd after choosing the project directory.
- 2- Run the server of the back-end at port "8080"
- 3- Then type in your browser "http://localhost:4200"

#### 4- Then start using your Producer\_consumer application

–Includes a UML diagram describing your code design thoroughly.







**For better quality download the uml file**

**<https://drive.google.com/file/d/1sp9ZMcfDNTYQxKjXdQcMTBMsy5Mm-dZC/view?usp=sharing>**

**–Describes thoroughly how you have applied the required design pattern in your code.**

**1- Concurrency design pattern :-**

This design pattern is applied in making machines - Threads- that consume objects from certain queues for a certain time then produce them.

**2- Observer design pattern :-**

This design pattern is used to observe whether one of certain queues for each machine has elements to consume or wait for them to have elements.

**3- SnapShot design pattern :-**

This design pattern is used in making snaps to store certain data when a machine consumes or produces an object so the simulation can be replayed.

**4- marker interface design pattern :-**

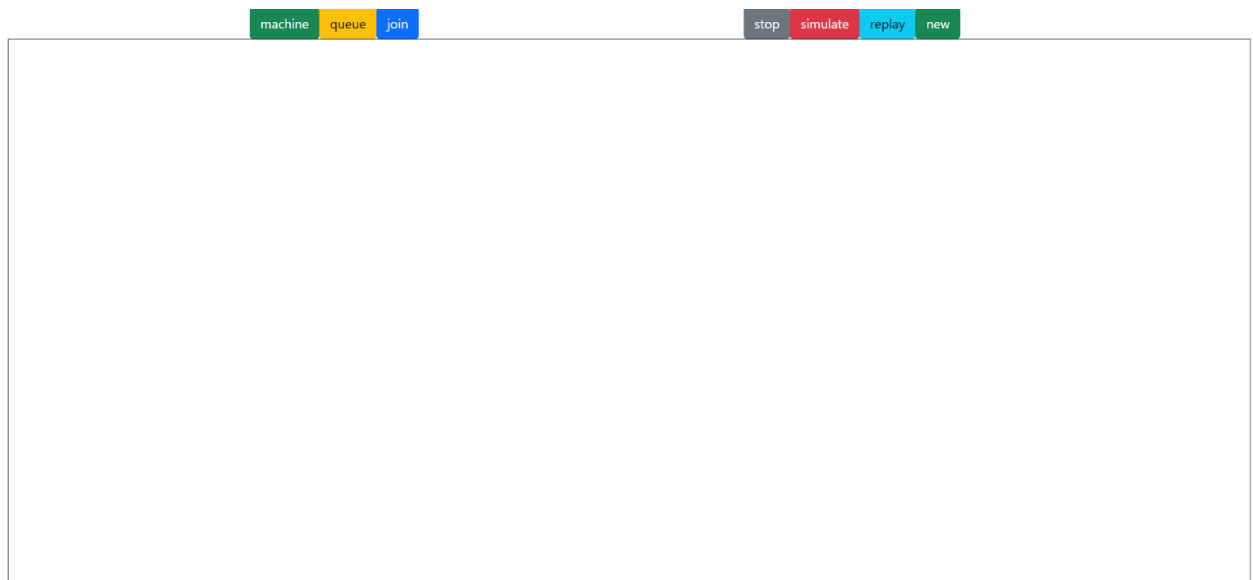
Machine class implements runnable interface to be able to make threads.

**–Includes any design decisions that you have made should be listed clearly.**

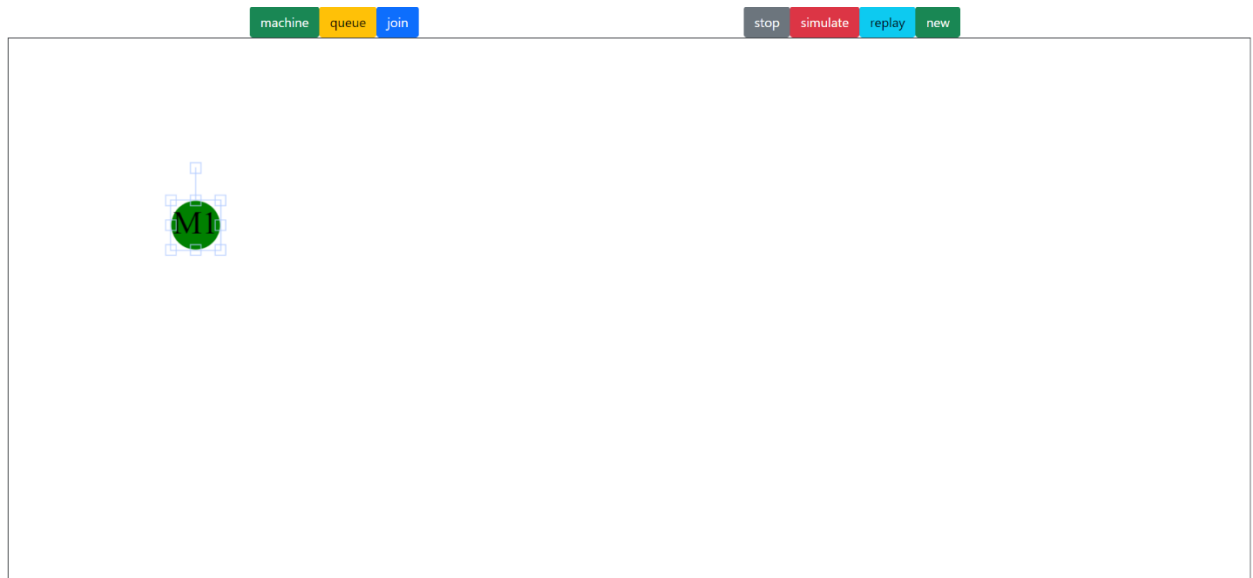
- Any queue is only joined to a machine
- Any machine is only joined to a queue
- The number of objects in the queue is typed bellow the queue number

- If the user wants to join two objects he select the first object then the second object and presses the join button
- Number of objects at the start of the simulation is 9
- ...

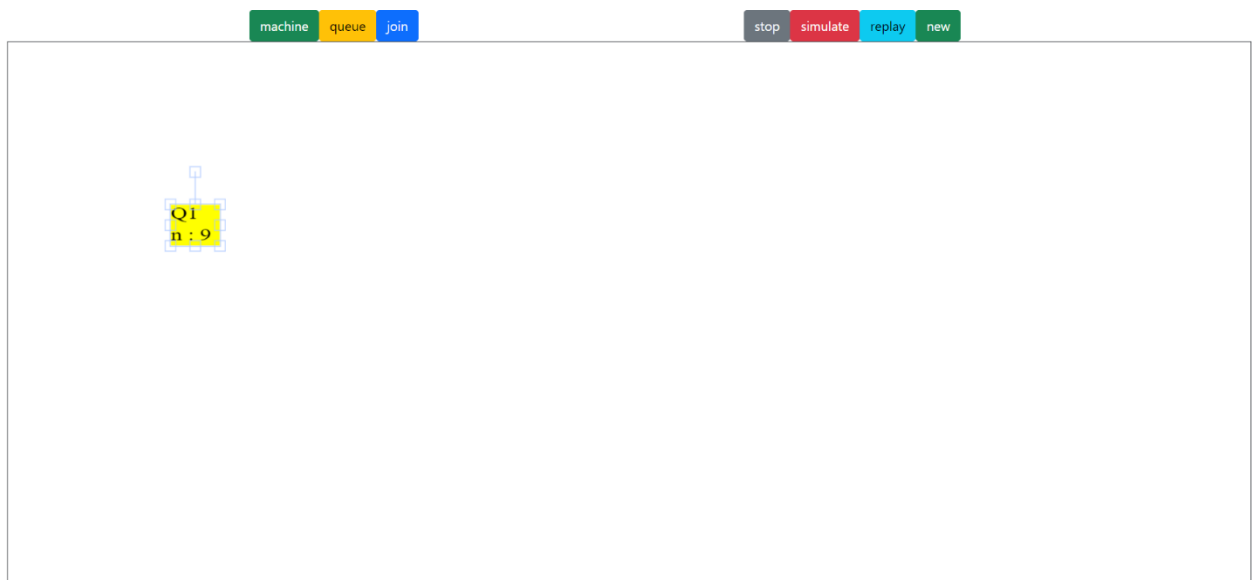
**–Includes snapshots of your UI and a user guide that explains how to use your application.**



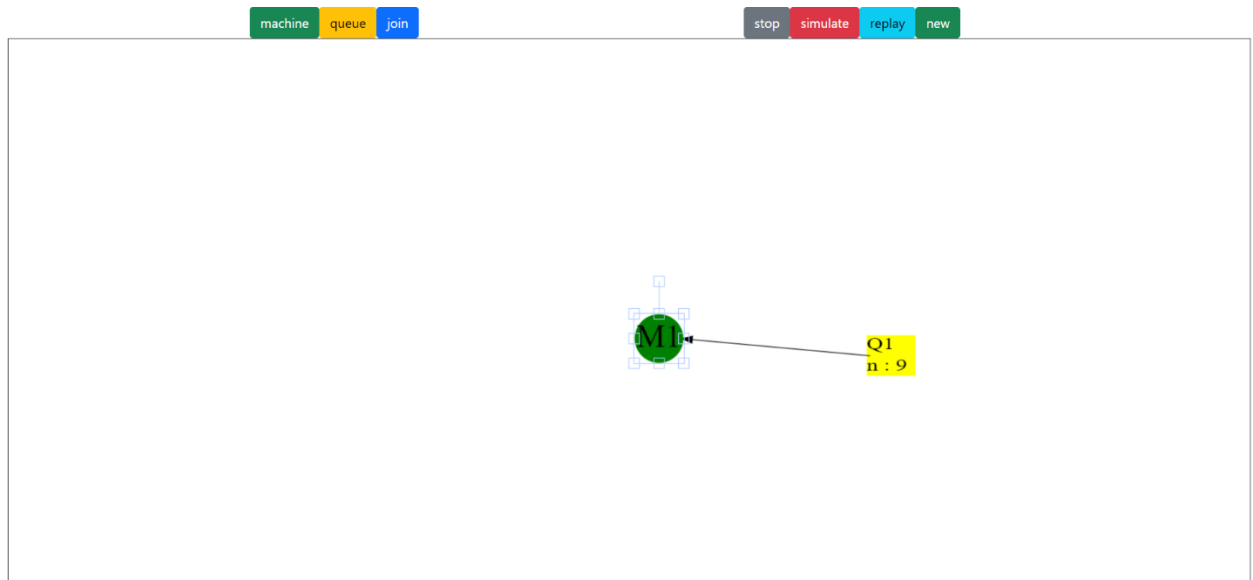
**The main page of the prodcer-consumer program**



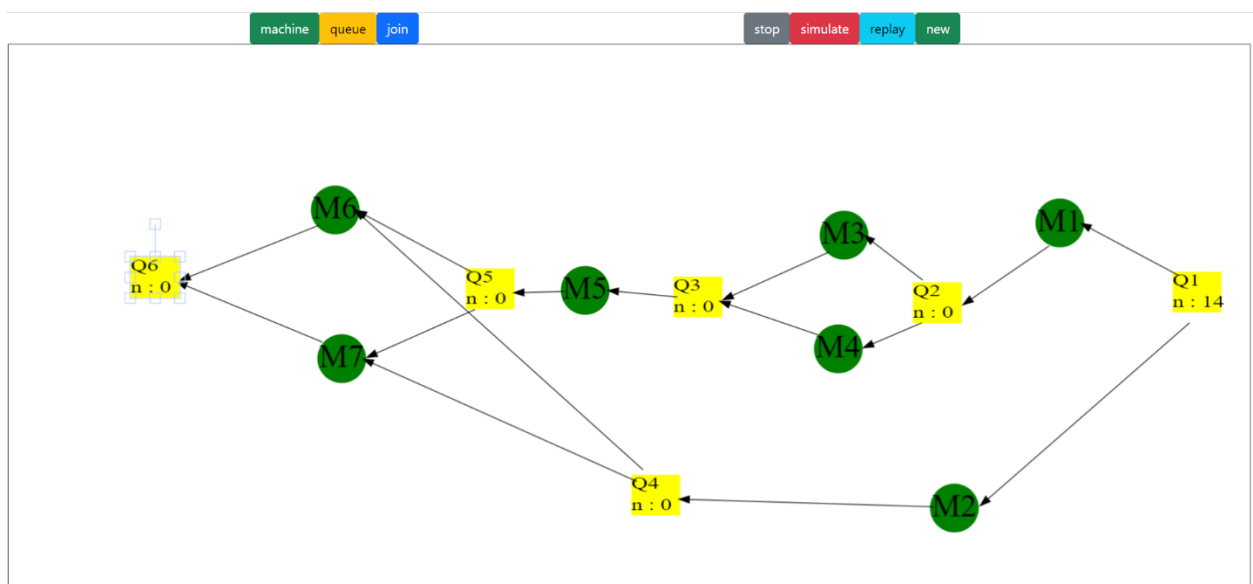
**To generate a machine just press the machine button**



**To generate a queue just press the queue button**



To join to objects select the first object then the second object then press the join button





**Draw the shape that you want to simulate then press the simulate button**

**The UI shows the simulation by displaying the number of elements in the Qs in real time.**

- **Ms flash when they finish servicing an item and every product has its own color (a random color) that will keep it from start till the end and each machine will change its color the product's color being processed by it then change back to a default color once done to make following the simulation easy for the user.**
- **After the simulation ends, the user can replay the previous simulation by pressing replay**
- **If the pressed stop then the simulation ends , and the user can replay the previous simulation by pressing replay till the stop pressed**

**or start a new simulation by pressing new**

machine queue join

simulate replay new