Project Specification - Group 13

Scenario

A factory produces different products and employs several machines than can build some part of a different number of products. It is assumed that all machines are connected through a production line, therefore each product can be built in any sequence of machines that fulfills its build sequence. Each product also as a different priority that must be respected when choosing witch product to build next.

> **Example:**
>
> - **Product A** is built by applying the following sequence of tasks: T1 -> T2 -> T3.
> - **Machine X** can complete tasks T1 and T3.
> - **Machine Y** can complete tasks T2 and T3.
> - **Machine Z** can complete task T3.
>
> Product A can be built using different sequences of machines, such as:
>
> - X (T1) -> Y (T2, T3)
> - X (T1) -> Y (T2) -> X (T3)
> - X (T1) -> Y (T2) -> Z (T3)

Agents

The products and the machines are the agents of the system.

Interactions

The products interact with the machines in order to understand where they should go next, according to the task that has to be performed.

Improvements (Nice to have)

Initially, it is to be considered that the machines have infinite resources, have uptime of 100% and perform each task correctly. In order to introduce complexity into the multi-agent system, some changes can be performed:

- Machines can run out of resources.
- Machines can be damaged and thus be unavailable for some time.
- Machines can perform some tasks incorrectly, rendering the product useless.

In order to accommodate these changes, a new agent would be introduced — the technician — which would be responsible for both refilling resources and fixing machines. This would also add interactions between the machines and the technicians.