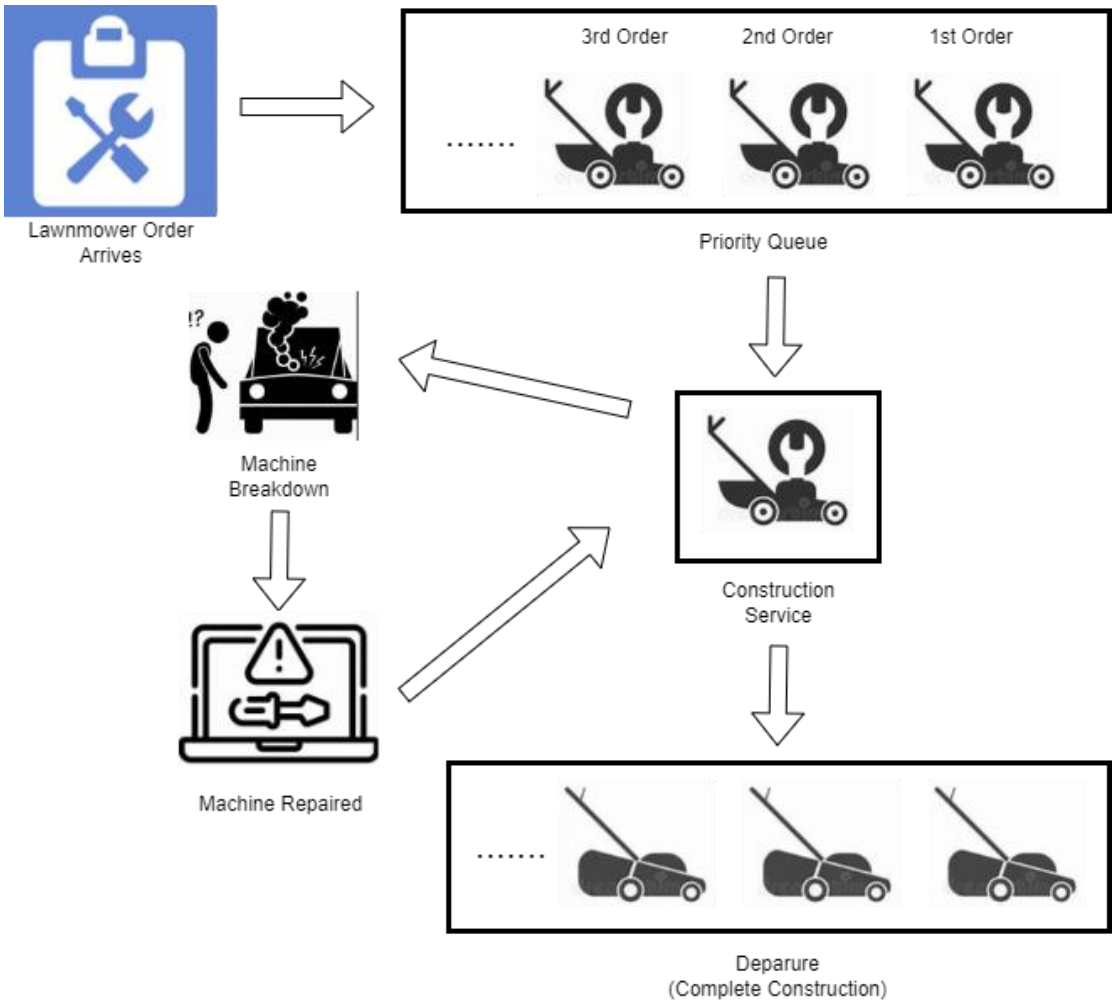
Decision Science Assignment 2

Part1

1. Draw a schematic of system



2. Describe the state(s) of the system.

The system have two states:

- Available: The machine can work normally. Order will entry into construction process one by one.
- Breakdown: The machine was broken down. All the order was stopped until the repair event was completed. If an order was constructing when the machine was broken, the construction was interrupted and resumed once the repair event was finished.

3. Determine the entities in the system in relation to the state.

The entity in the system is lawnmower order.

4. List the types of events in your model.

- describe how each event changes the state of the system.
- describe the new events that may be created as a result of this event.

In this system, there are four fundamental events that play a role in its operation: Arrival, Breakdown, Repair, and Departure.

Event Arrival:

- Arrival signifies a new lawnmower order arrives. It doesn't immediately change the system's state as it depends on the blade-fitting machine’s status, but it triggers that the next Arrival event will happen.
- When an Arrival event occurs and the blade-fitting machine is good and available, one lawnmower order from the queue will entry into construction processing.This action activates a new Departure event.

Event Departure:

- Departure indicates the completion of an order as a lawnmower is processed and leaves the system. This event will change the system's state from busy to available.
- After successfully loading blades onto a lawnmower, there are still lawnmowers waiting in the queue and the machine is available, one lawnmower from the queue will entry into the construction processing, initiating a new Departure event.

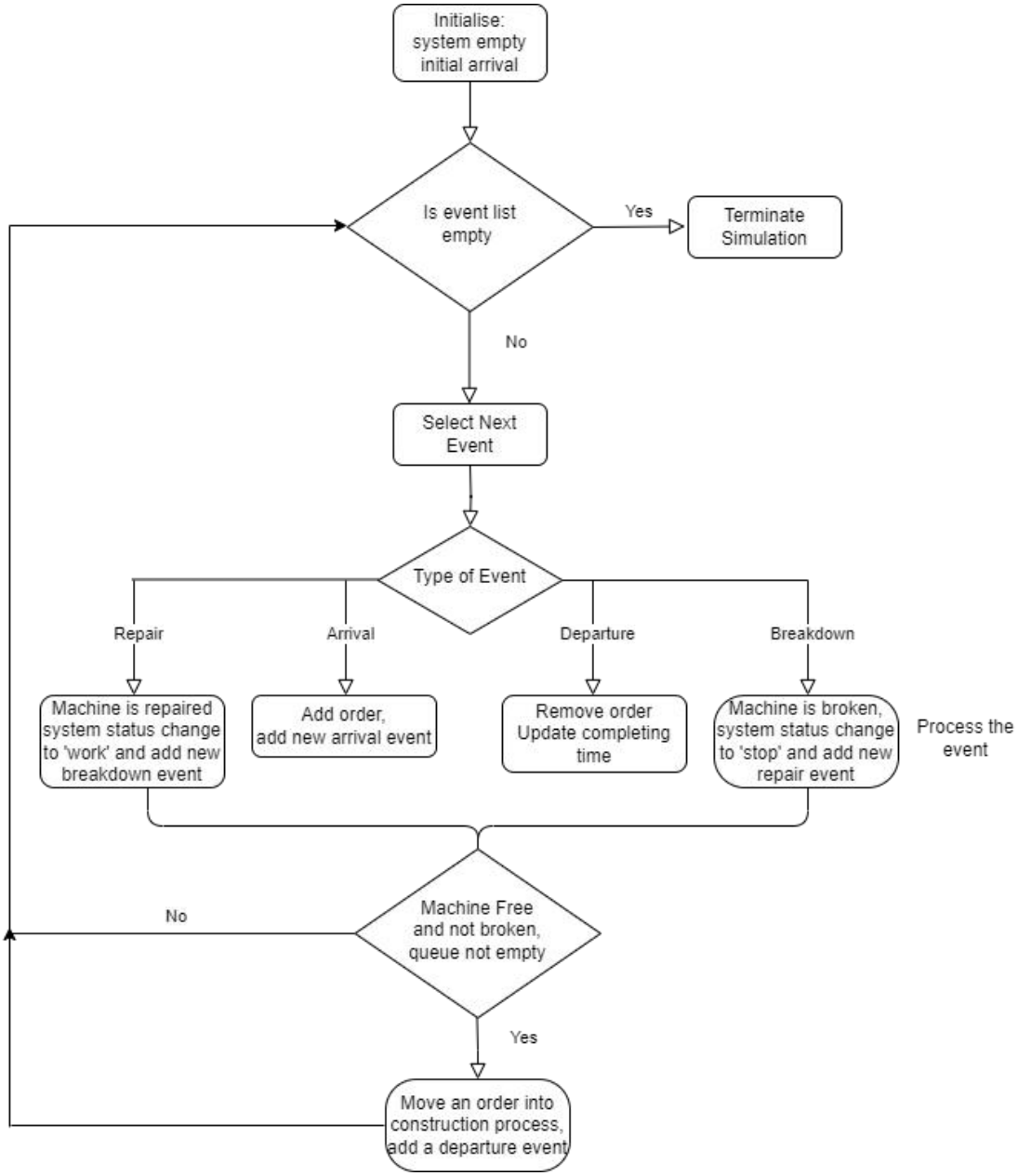
Event Breakdown:

- The Breakdown event signifies a malfunction in the blade-fitting machine, causing a transition from the available state to a breakdown state.
- This breakdown event also leads to a Repair event, which is necessary to restore the machine's functionality.

Event Repair:

- The Repair event involves repairing the blade-fitting machine,which will change the system state from the stop back to the available state.
- The occurrence of a Repair event implies that another breakdown may happen in the future.

5. Draw a flow chart illustrating your simulation structure.



Part 2

1. Draw a state-diagram of the system.