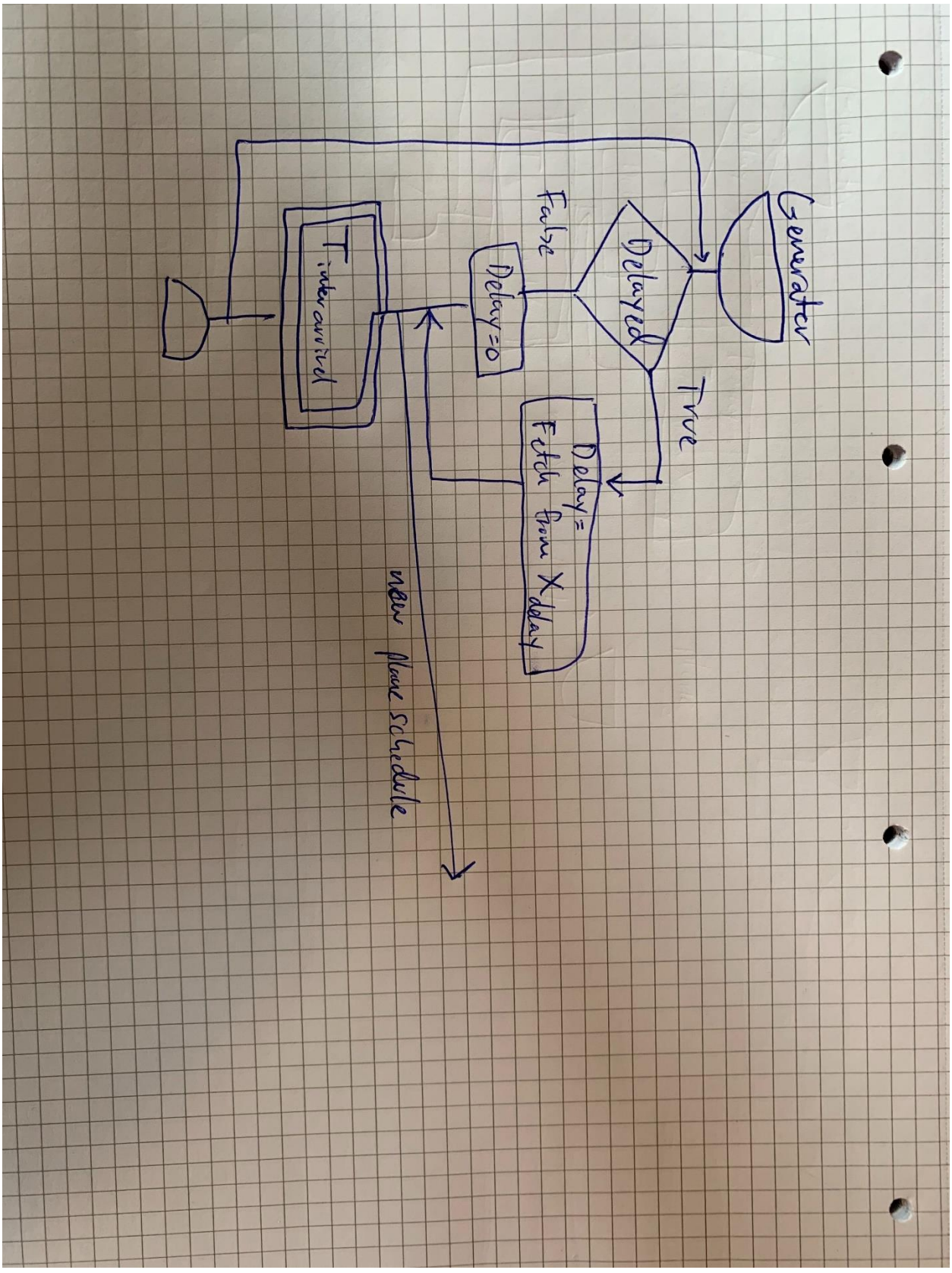
Simen Aarnseth and Jakob Lund Johannessen

TTM4110 Lab 1

Part 1

a) 1. Planes start to depart and arrive at 5 AM. Arrivals and departures will continue to happen at varying rates throughout the day until 12:00 AM. A daily schedule is generated everyday and it dictates all the arrivals and departures at the airport for that day. This is done by using a time-dependent Poisson process with an inter arrival guard time. The guard time is the window of time assigned individually to each plane in which they will land. Two planes cannot share the same window. Additionally a plane cannot land if another plane is taking off at the same time. It will have to wait until the takeoff is complete. It is possible for each plane to be delayed, the chance of this happening is P(delayed). Every delay is sampled from an Erling-k distribution.
   2.



3. Psuedocode for the generator of arrivals of planes

```
Generator

If(delayed = true)
        totalDelay = selectRandomTime(X_delay)
else
        delay = 0

sleep(interArrivalTime)
```

b) 1. The system state is if the runway is available or not, the number of planes on the ground and the number of planes waiting to land. The corresponding events are plane arrivals, departures, taxing, turn around times, deicing and delays.
2. The left part of the figure further down is the answer to plane arrivals and takeoffs in nice weather

c) 1.The weather now becomes a part of the system state. In this instance the amount of snowfall/the number of runways that need to be plowed. To tackle this snow plowing,fetching the snow plow and returning the snow plow becomes additional events.

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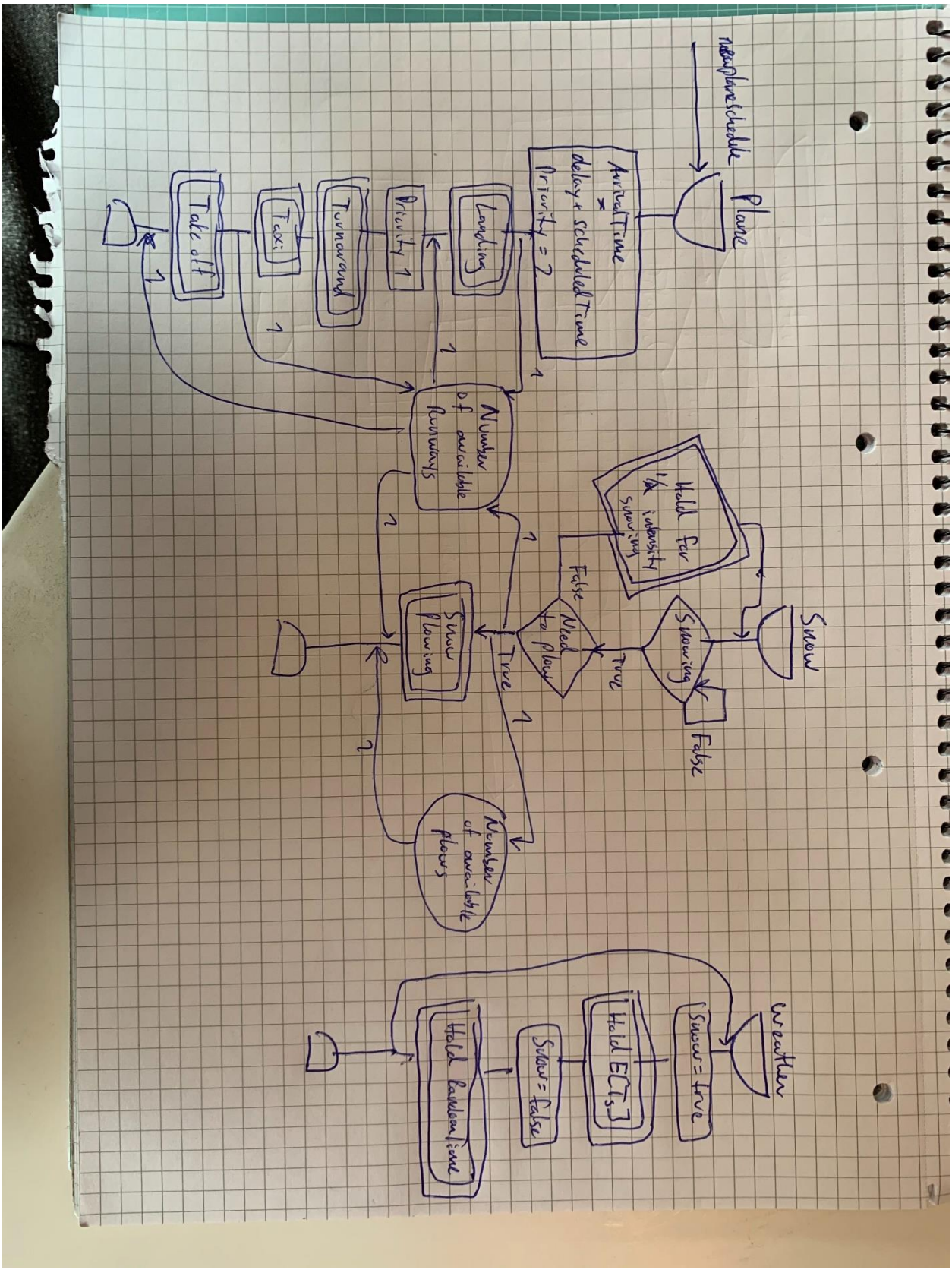

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