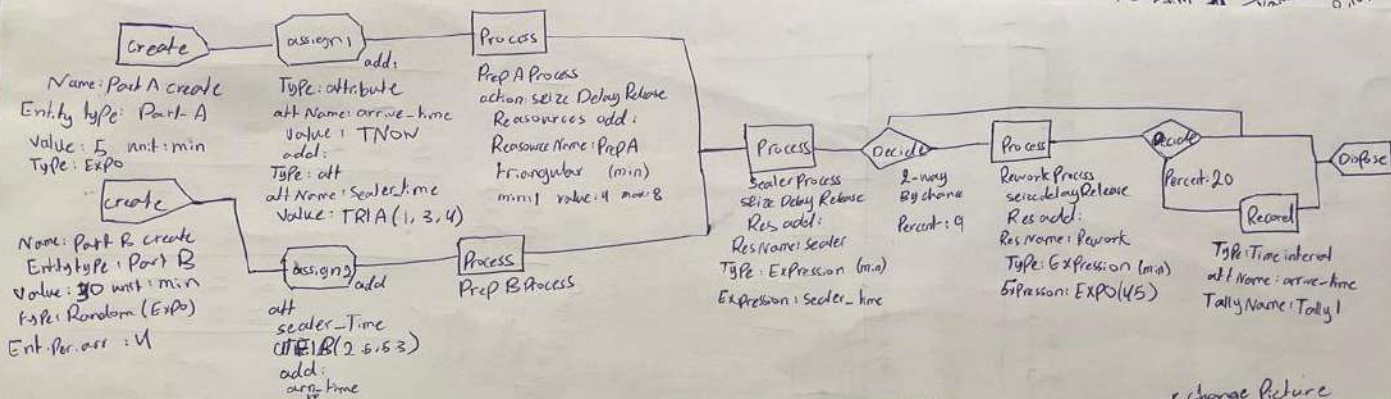




schedule

Rules:

- ignore: capacity goes down immediately but work goes on until finished -- "break" shorter or gone.
- wait: capacity decreases until entity releases resource -- "break" full but maybe start/end late.
- preempt: processing is interrupted, resumed at end of "break".

* Failure for Resources:

- based on count: # of parts passing before failure
- Time: ex every 120 hrs (uptime) → down time of (..)

* something changing with time [not a function of entity] → "Time Persistent"

ex: # of WIP, utilization, Q size

"tally" ← entity is always there

ex: time in Q, time in sys

- counters are special case of "time persistent"
- (avg Q size) (total time in sys)

* change picture

- Entity (Project bar) → initial Pic
- assign → ent. Pic

- * change queue animation from line to point:
- double click on queue → type: Point
- click Points button → add Points drag them around screen

* how to make inter arrival time deterministic or random?

- create → Type → constant: every replica will be the same
- Type → Random: inter arrival will be diff in every replica but the same for the same replica.

* what is empirical dist?

a distribution of the data itself, square error is zero

how to fit dist to inter arrival data?

tests → input analyzer → histogram → notepad
then fit

Run → seq up → start date and time → 12 AM

	arr	dep	Wq	Ts arr-dep
1	0	2.9	0	2.9
2	1.73	4.66	1.17	2.93
3	3.08	8.05	1.58	4.97
4	3.79	12.57	4.26	8.78
5	4.41	17.03	8.16	
6	18.64	21.39	0	
7	19.39			
8	34.41			

$$\text{avg } Wq = \frac{\sum_{i=1}^N Wq_i}{N}$$

avg # of parts in Q

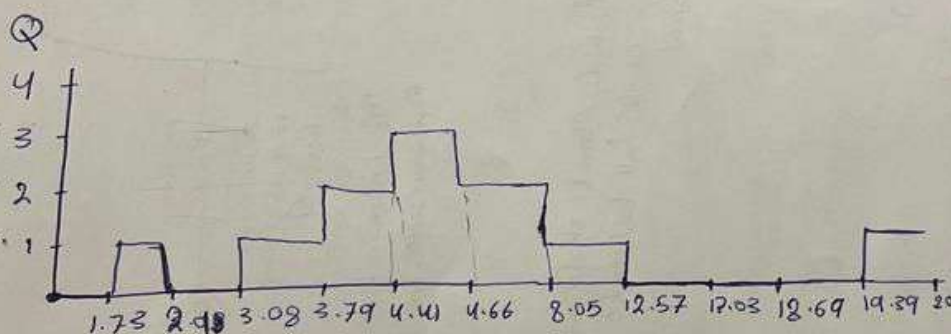
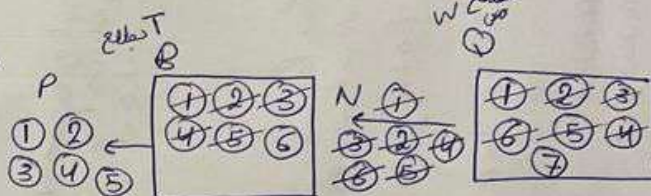
$$\text{avg time in sys} = \frac{\sum_{i=1}^P Ts_i}{P}$$

$$\text{utilization} = \frac{\text{area under } B}{\text{area} \times 20}$$

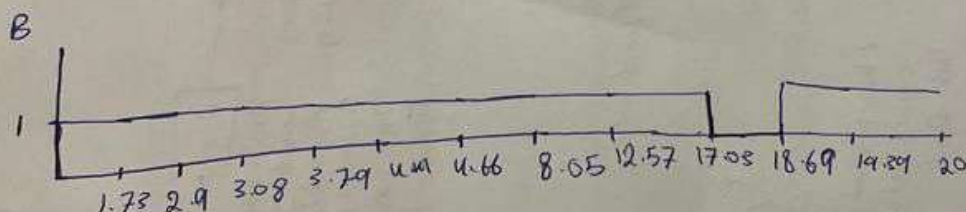
$$Wq_n = \text{arr}(n) - \text{dep}(n-1)$$

$$Ts_n = |\text{arr}(n) - \text{dep}(n)|$$

① خط
② خط
③ خط
④ خط
⑤ خط
⑥ خط
⑦ خط
⑧ خط
⑨ خط
⑩ خط
⑪ خط
⑫ خط
⑬ خط
⑭ خط
⑮ خط
⑯ خط
⑰ خط
⑱ خط
⑲ خط
⑳ خط



1	2.9	dep
2	1.73	arr
3	3.08	arr
2	4.66	dep
4	3.79	arr
5	4.41	arr
6	18.64	arr
3	8.05	dep
4	12.57	dep
5	17.03	dep
7	19.39	arr
6	21.39	dep
8	34.41	arr
-	20	End



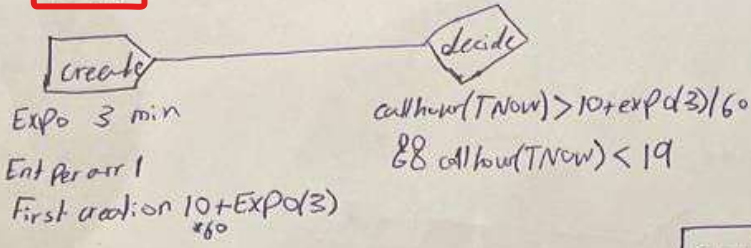
$$\text{area } Q = 1.17 + 0.71 + 1.24 + 0.75 + 6.78 + 4.52 + 0.61 = 15.78$$

$$\text{area } B = 18.34$$

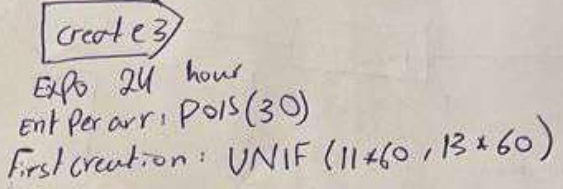
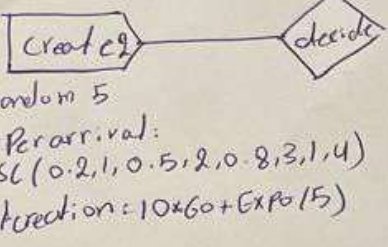
$$\text{utilization} = \frac{18.34}{20} = 0.92$$

$$\text{avg } Wq = \frac{15.17}{6} = 2.53$$

4-18

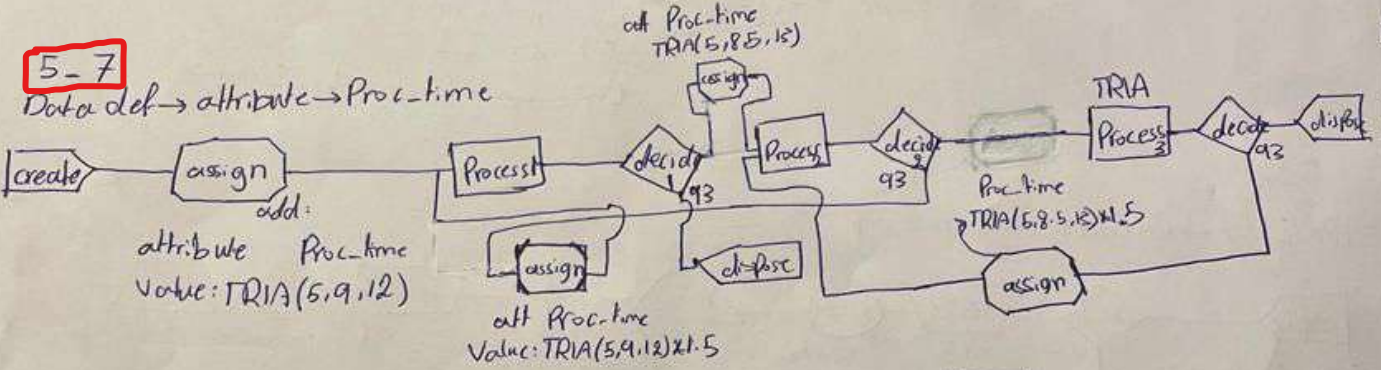


Run → set up → start date and time → 12 Am
Base time unit → min



5-7

Data def → attribute → Proc-time



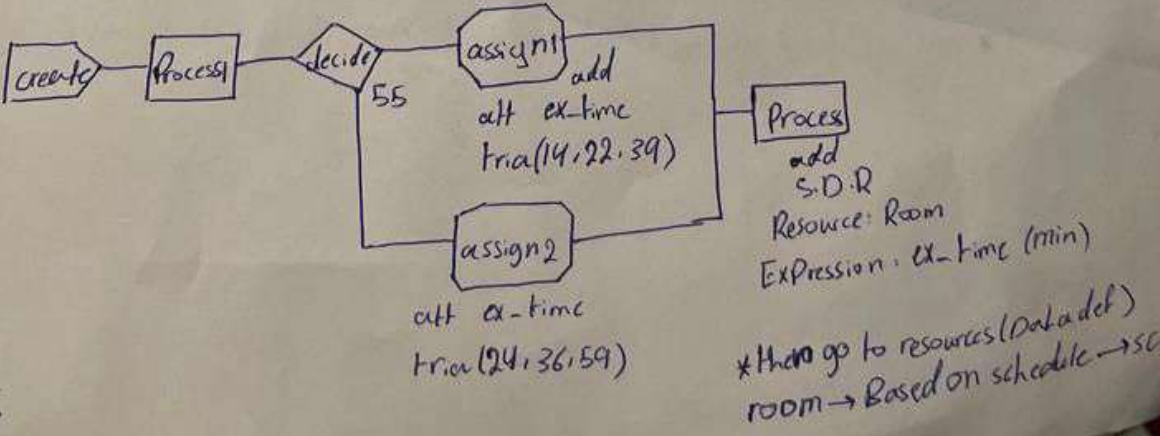
5-12

Type: schedule
schedule 1

schedule → arrival → add rows

1	1	22
2	1	35
3	1	40
...	...	...
8		

4-27 and 4-28

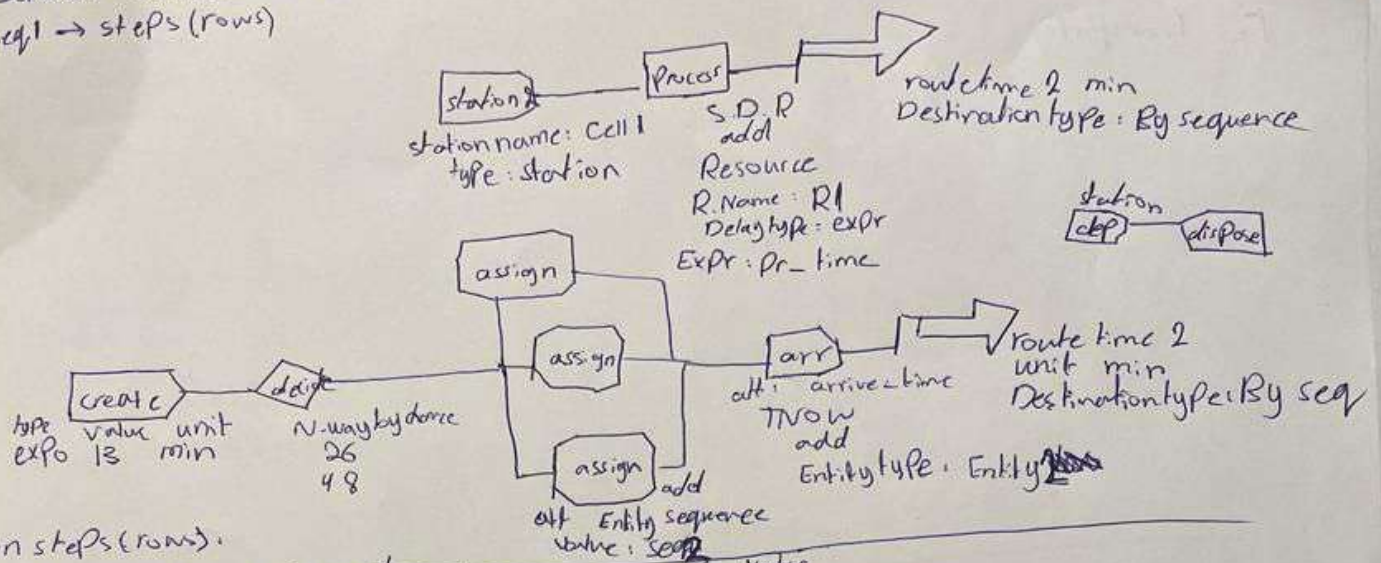


* Then go to resources (Data def)
room → Based on schedule → SC

schedule:
SC 1
Type: Capacity
Time unit: half hours
Duration:
3 7 2 3
2 3 3 6
3 6
3 7

Ch 7

Detail → attribute: Pr-time
 seq1 → sequence → add:
 seq1 → steps (rows)



in steps (rows):

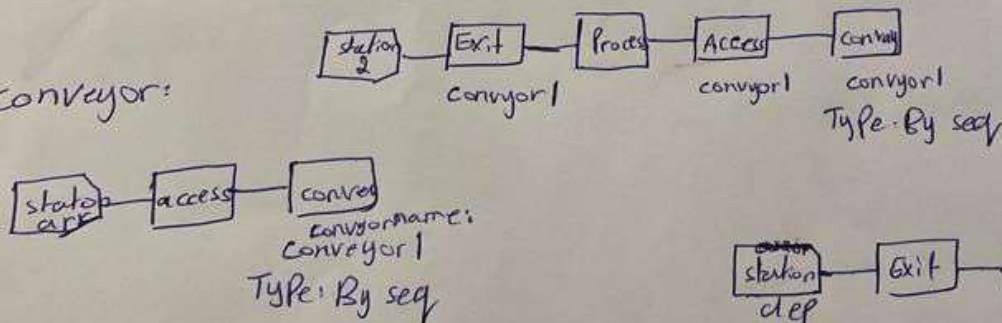
station name:
 Cell 1
 Cell 2
 Cell 3
 Cell 4
 dep

Then
 seq2
 seq3

assignment	type	Name	Value
rows → attribute	Pr-time	trial(6, 8, 10)	
→ "	"	trial(15, 8, 10)	
		trial(15, 20, 25)	
		trial(8, 12, 16)	

* animation
 route
 then open ☐ and identify the station

for conveyor:



animation:

segment → click for first ☐ then double click to add destination
 name the start cell and dest cell.
 change segment identifier to conveyor1.segment

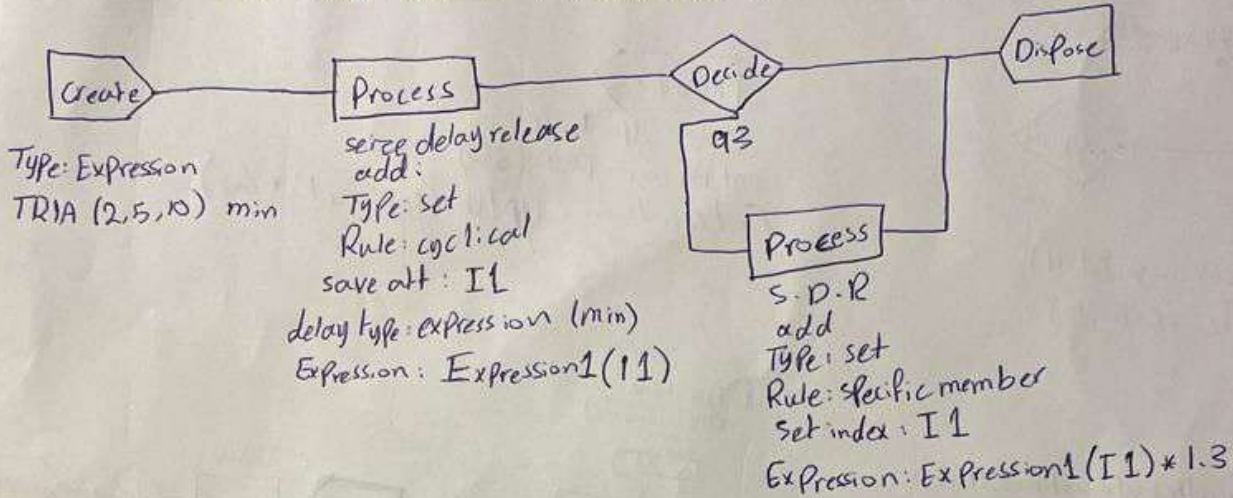
segment → Reg station: arrive-station → Next station rows

* add conveyor from Project bar

Next station	length
Cell 1	24
Cell 2	30
dep	21
Cell 3	24
Cell 4	39
arrive-station	21

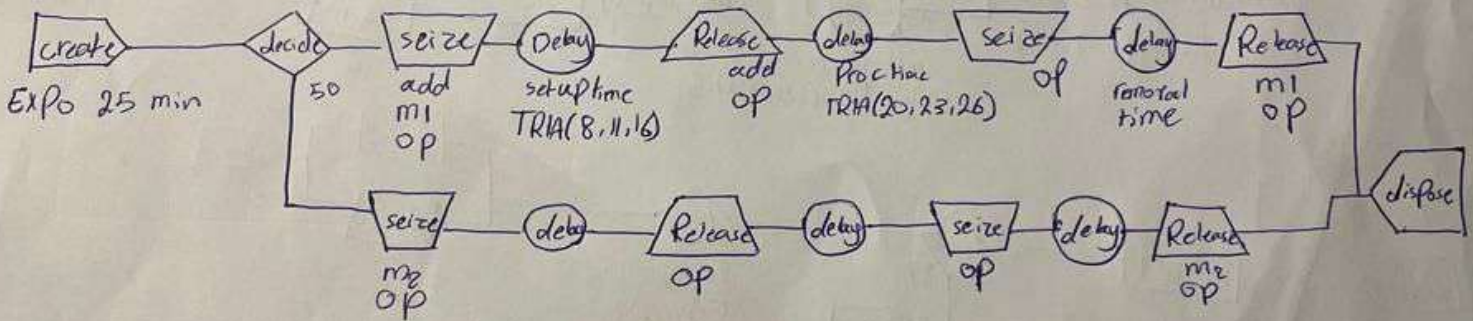
5-5

Data def → Resource → add 4 Resources
 → Expression → in rows add 4 TRIA (assembly time)
 → set → Type: Resource → in rows add 4 rows

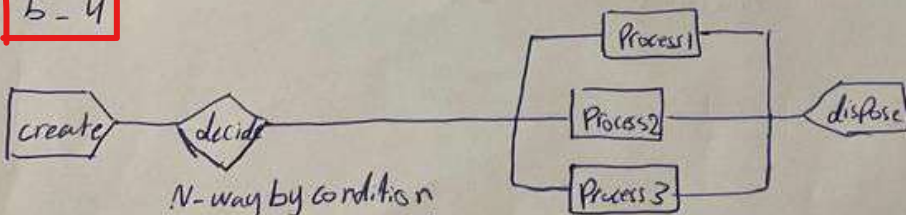


5-9

Data def → Resource → m1, m2, op



5-4



N-way by condition
 Expression add:
 $NQ(\text{Process1}, \text{Queue}) + NR(\text{doc1}) \leq NQ(\text{Process2}, \text{Queue}) + NR(\text{doc2})$ & " " " " $\leq NQ(\text{Process3}, \text{Queue}) + NR(\text{doc3})$
 add:
 $NQ(\text{Process2}, \text{Queue}) + NR(\text{doc2}) \leq NQ(\text{Process3}, \text{Queue}) + NR(\text{doc3})$

Queue → current # in queue
 Then queue name

Resources Wage → current number
 Then choose Resource busy

1	1	22
2	1	35
3	1	40
8		

4-27 and 4-28

Schedule:
 SC 1
 type: Capacity
 time unit: half hours
 Duration:
 3 7 2 3
 2 3 3 6
 3 6
 3 7

