

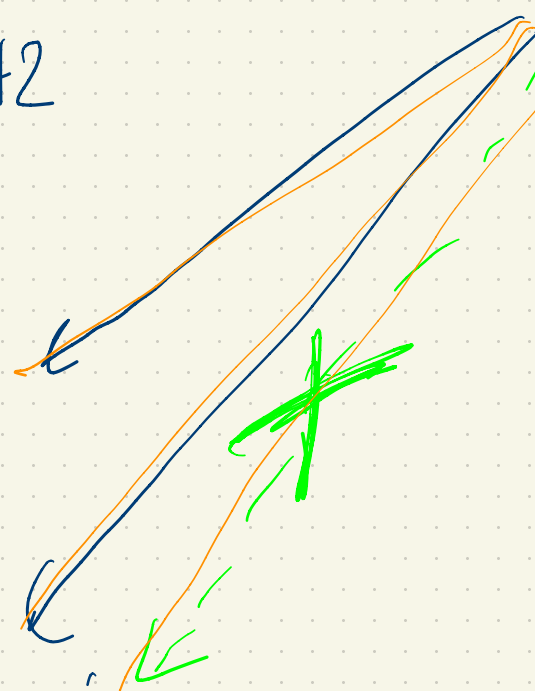
Flight 1 ← aircraft 1

Flight 2 ← aircraft 2

Flight 250

a/c m

Flight N



ARN 08:00 - LHR 10:00 UTC

flight 1

flight 2

a/c 1

a/c 2

a/c 3

Subj 1

B777

a/c 4

a/c 5

a/c 6

a/c 7

a/c 8

Subj. 2

A320

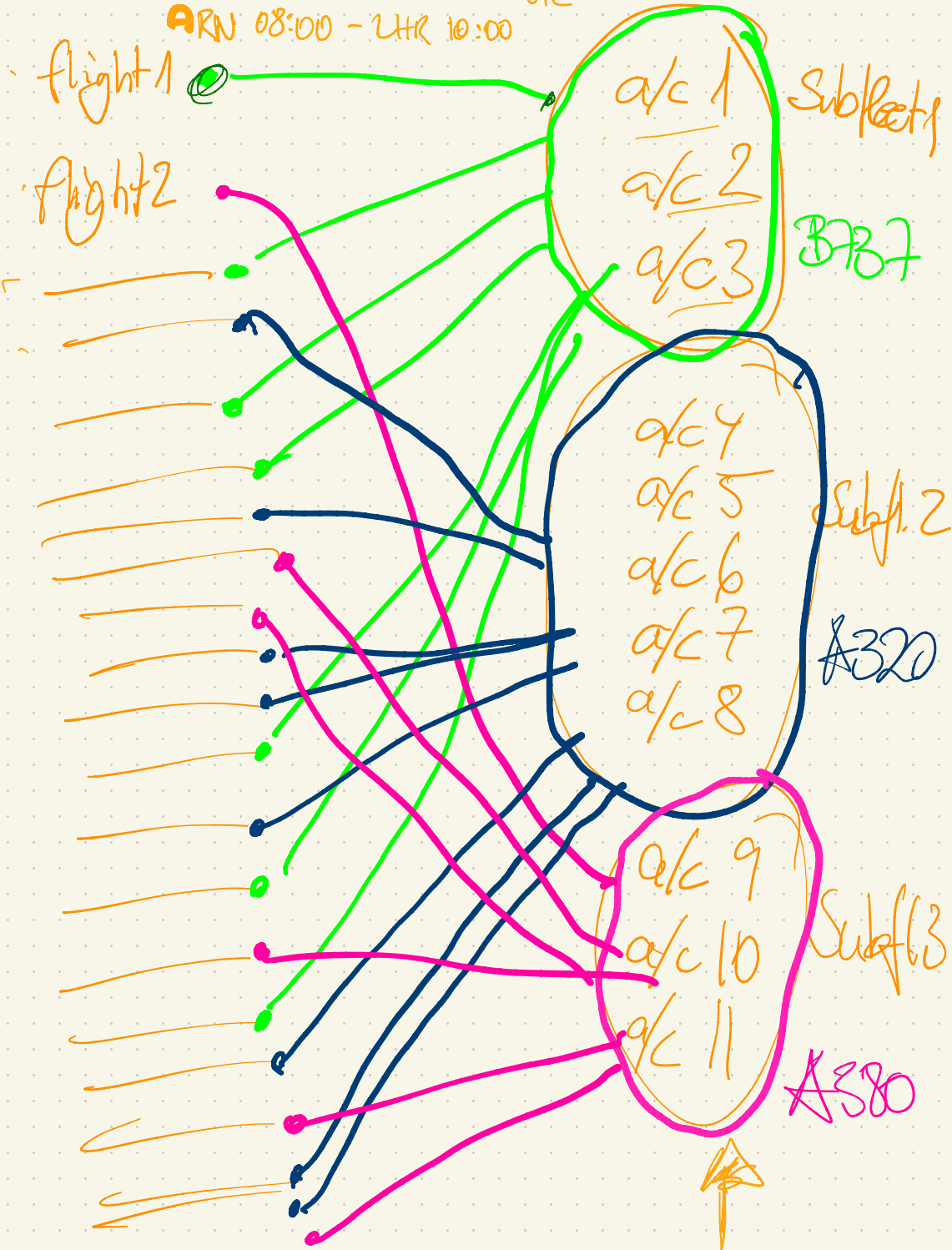
a/c 9

a/c 10

a/c 11

Subj 3

A380



~~X~~ Flight 1 ARN 08:00 - LHR 10:00

a/c 1

~~X~~ F3 LHR 11:00 - CDG 12:30

a/c 2

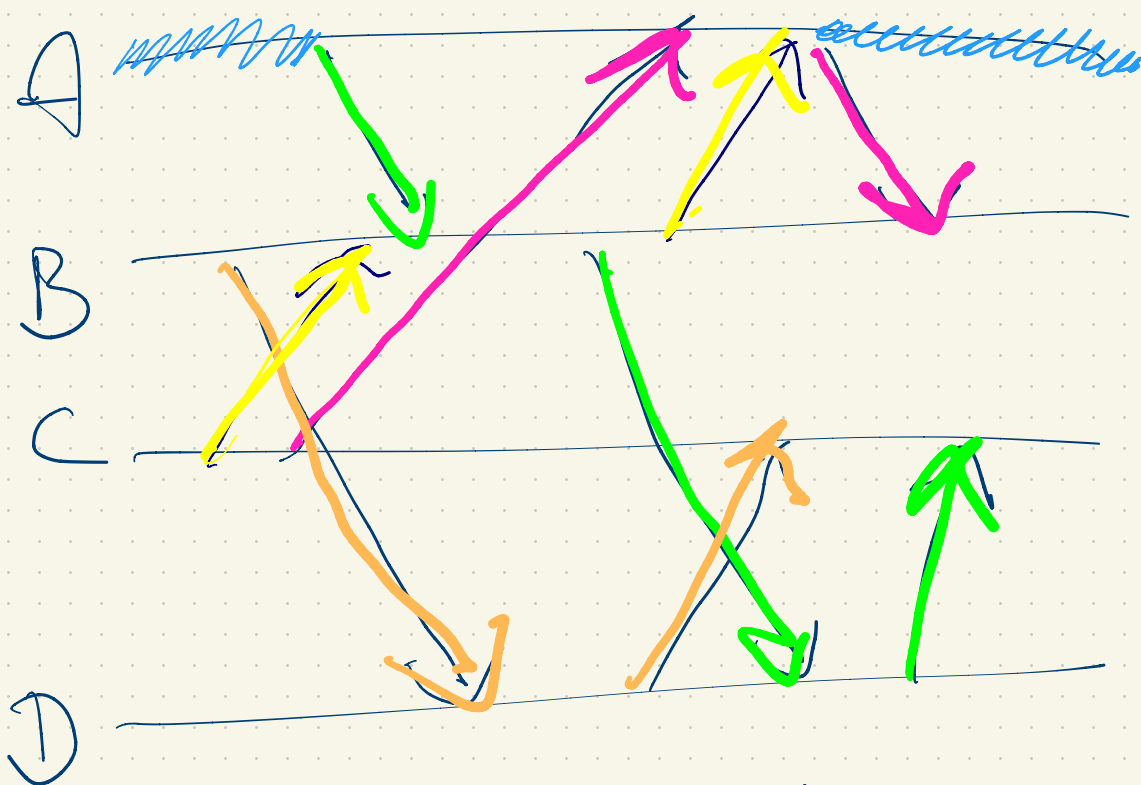
~~X~~ F7 MUC 10:30 - CPH 12:30

a/c 3

X F50 CDG 14:00 - CPH 16:00

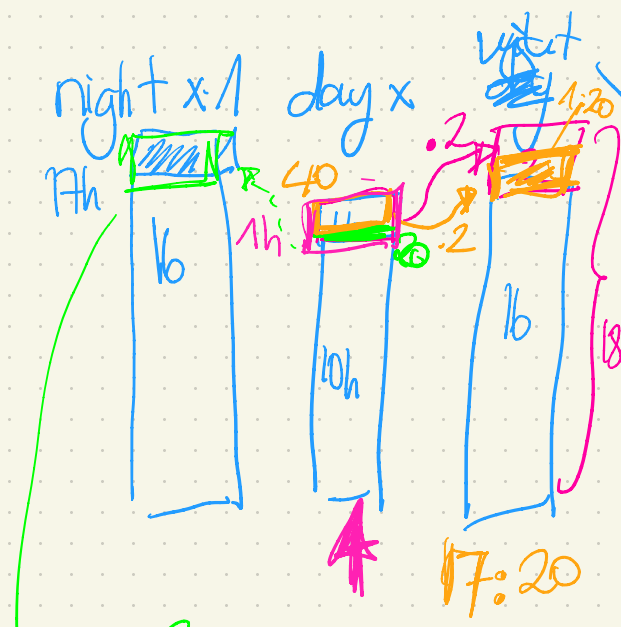
B-check 17:00 a/c 1 CPH

⋮



alc1 alc2 alc3 alc4

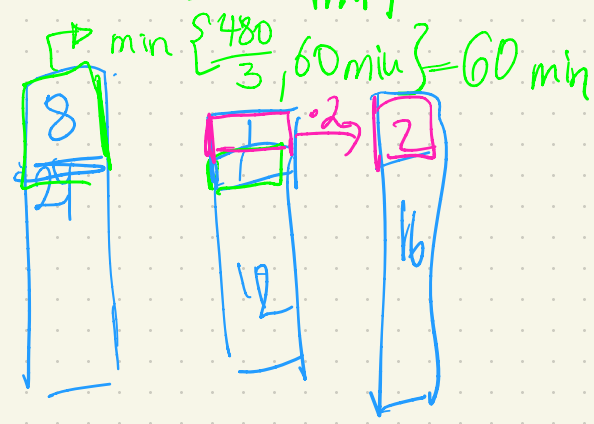
day1	●	●	●	●
d2	●	●	●	●
d3	●	●	●	●
d4	●	●	●	●



$$\min \left\{ \frac{\text{extra night rest}}{3}, 1 \right\}$$

$$\min \left\{ \frac{60 \text{ min}}{3}, 60 \text{ min} \right\}$$

$$= 20 \text{ min}$$



Problem 1: Crew rest time

10 points

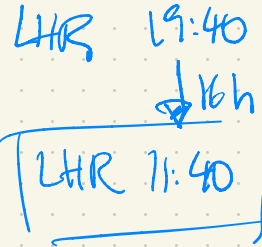
Pilot X works for airline FlyFast. Because of good contacts to the unions, FlyFast managed to negotiate few, simple rules for the rest periods of their pilots:

- Maximum 10 flight hours per day. Those 10 hours can be exceeded by maximum 2 hours. This holds only if the night rest is extended by 2x extension. If the rest period in the night before was longer than 16 hours, up to 1 hour can be assigned to the night rest of the prior night with: $\min\{\text{extra night rest night before}/3, 1\}$ hours.
- Minimum 16 hours rest between last flight of a day and the first flight of the next day.
- Maximum 40 hours flight within an arbitrary 7 day period.
- Minimum 24 hours time off (uninterrupted) at home base within an arbitrary 7 days period.

$$\min\left\{\frac{60m}{3}, 60m\right\} = 20m$$

Pilot X had 9 flight hours on October 5, October 6-8 he had time off at his home base LHR, on October 9 he flew 5 flight hours, with the last flight ending at 14:00 UTC. On October 10 he flew:

- LHR-MAD, 2h 30 min flight time, 07:00-09:30 UTC
- MAD-LHR, 2h 20 min flight time, 10:30-12:50 UTC
- LHR-FCO, 2h 30 min flight time, 13:30-16:00 UTC
- FCO-LHR, 2h 40 min flight time, 17:00-19:40 UTC



Unfortunately, FlyFast's pilot Y is sick on October 10. Amongst others he was scheduled to fly flight FF234, LHR-CDG, 1h 20 min flight time, 20:30-21:50 UTC. The crew controller plans that pilot X takes over flight FF234.

- According to the rules for rest periods: Is it possible that pilot X flies on flight FF234, is it a feasible pairing? If yes, what is the earliest time a flight he is scheduled for can depart on October 11?
- If X is used on flight FF234, what other consequences result for crew planning?

