Sketch about synchronization

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Manuscript synchronization sketch IN1010 lecture 9/4-2024 14:15 at University of Oslo, Sofus Lie Auditorium.

1. Stein enters the room several (say 5) minutes before the start of the lecture – Stein should stand near the blackboard that is on the left side (left as seen from the students). Eric enters hurriedly at 14:15:15 and heads for the blackboard behind the main desk on the right (again, "right" as seen from the students' point of view).

2. Eric starts his computer and then heads for the blackboard and then both starts writing on each their blackboards: "IN1010 Synchronization" and bids welcome to the lecture.

3. Discover each other:

> Eric: "Hi, what are YOU doing here?"
> Stein: "I am doing today's lecture!"
> Eric: "No, I am doing today's lecture!"

4. Both pull out a version of the lecture plan (just use this manuscript):

> Stein (pulls out a printed schedule): "No, I am doing today's lecture, see this schedule!"
> Eric (pulls out a printed schedule): "No, I am doing today's lecture, see THIS schedule!"
> Stein: "Mine is the REVISED schedule!" (points to the word REVISED)
> Eric: "Mine also says REVISED!" (points to the word REVISED)

5. EJ: "What do we do about this?"

6. Short pause, then: both *in unison* (triggered by Eric sweeping his hand across toward Stein): "After you!!!" (repeat 3 times, *i.e.*, a total of 4 times).

7. Eric: "This is not working out!! How are we to decide who should do the lecture?? I must be able to devise a method for us to decide who should lecture – after all, I AM a PROFESSOR!" (Eric scratches his head…) – "… hey, I have a great idea! A FLAWLESS system that will ensure that there is only ONE lecturer!"

8. Eric: Sets up an opaque bowl and explains: "Here is how we ensure that there is no more than one lecturer: When entering, a lecturer goes over to the bowl and check whether or not the bowl is empty. If empty, the lecturer then finds a piece of chalk and puts it into the bowl, indicating that there now *is* a lecturer. If NOT empty then the lecturer knows that there ALREADY is another lecturer, and thus can leave. This FLAWLESS system thus *ensures* that there is ONLY one lecturer!"

9. Eric then walks over to the bowl, checks that it is empty then moves away gets a piece of chalk. He then starts bragging about his FLAWLESS system to ensure that only one will be lecturing while waving the piece of chalk in his hand. As Eric is walking away from the bowl, Stein resolutely and quickly moves over to the bowl, checks it (flip it upside-down), then swiftly finds a piece of chalk, dumps it into the bowl and then moves to the blackboard away from the door and starts writing the agenda on the board.

10. When Eric is done bragging about his FLAWLESS system, he goes to the bowl and drops the piece of chalk into the bowl and then goes back to the board. BOTH start lecturing – saying welcome and that today, we will talk about *synchronization* – BOTH stop when discovering that there are **TWO** lecturers.

11. Small discussion: Stein (sarcastic, shaking head, throwing up his hands): "FLAWLESS system indeed!".

12. Eric (again scratching his head): "Let me think … Ah! Now I know: I need TWO bowls. And now we start by putting chalk into one's OWN bowl and then checking the OTHER bowl. Eric: "This method ensures that there is AT MOST ONE LECTURER!"

13. Both now go to the blackboard, find a piece of chalk, put it into one's own bowl, then goes over to the other bowl to find chalk in it. Then both points to the other and says: "Ah, it is YOU that will lecture today!" and then both pack up and leave by the side doors on each side of the auditorium.

14. Eric returns and starts the actual lecturing.

Assignment: (Think carefully about your answers – and explain, *e.g.*, with examples):

- **What went wrong in point 4, 6, 9-10, and 12? Suggest a fix for the problems in 4 and 6.**
- **Is the statement at the end of point 8 correct? Explain.**
- **Is the statement at the end of point 12 correct? Why is it not sufficient?**