Inter Process Communication

Scenario: As a student of CSE department you need to access the wifi that is being provided by the BUET authority. The BUET authority assigns some teachers of CSE department to distribute the passwords of different access points. The student has to perform some tasks to acquire this password.

1. At first, s/he needs to make an online application with his student ID. Online applications are handled by teachers A, C, E. Each of them picks one from the outstanding applications and approves it. However, the teachers do not want to keep more than 10 applications outstanding. So a student may have to wait while trying to submit his/her application.
2. Then s/he must go to teacher B for signing his request sheet. This signing can be done one at a time only.
3. A student is not allowed to make multiple applications for password. The job of B is to verify that the applications approved by A, C, E do not contain duplicate applications from the same student. To make duplicate application possible, if there are n students, create m initial student processes where `m > n` and assign each of the m processes a student id between 1 to n. Thus multiple student processes will be having the same id and applications submitted by them will be considered as duplicate. If a student is found to have submitted duplicate applications, all of his/her applications will be discarded.
4. Teacher D will receive a complete list of student ID and Password auto generated by the system.
5. Students will enquire Teacher D if his/her password is already available. If so, s/he will collect it.
6. A student can apply again if a password is already generated for him/her by the system. This will not be counted as duplicate.

Your job is to help BUET authority with the Inter Process communication part of the system.

Try to simulate the scenario with at least 30 students. Give a small delay to simulate each task and give some printouts so that the flow can be tracked down.