CISC320 Algorithms

Implement an Algorithm

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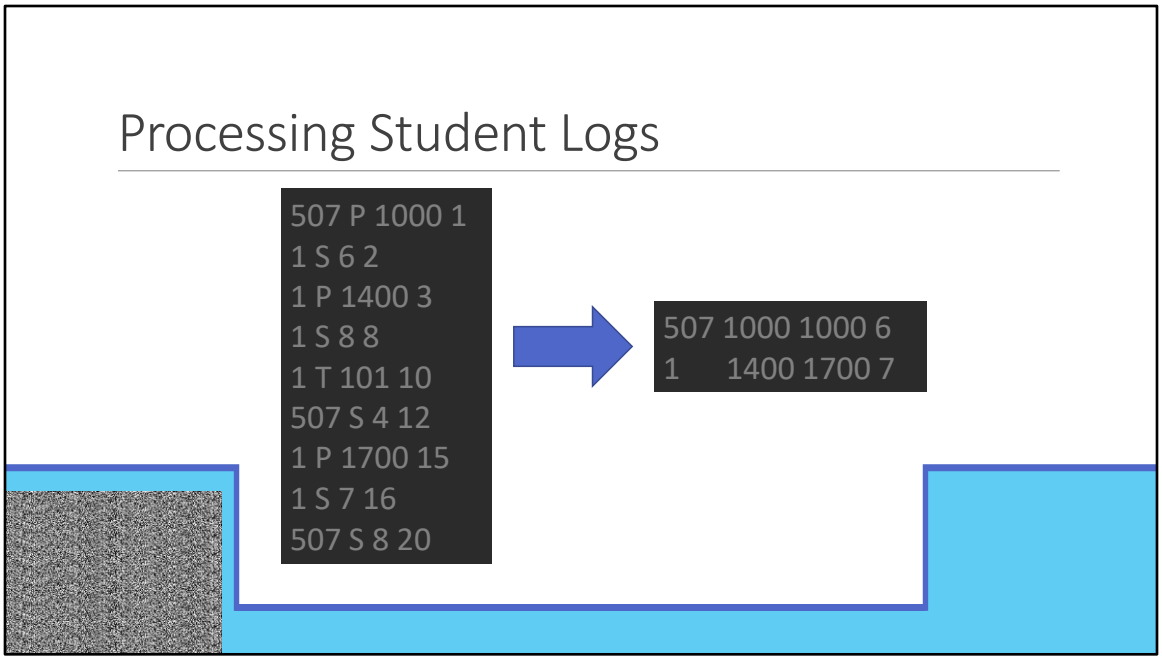
ATB: Let's implement an algorithm.



Bart: So, since you guys are all great programmers, I'm going to ask for your help with a new feature for ATB.
Bart: Basically, I need to be able to calculate a lot of students' grades very quickly.
Bart: This will be really important once ATB is being used by other Algorithms' courses.
ATB: Yes, I cannot wait until I am being used in every single classroom in the entire world.
Bart: Uh, sure. Yeah, I'm excited about that too.
ATB: They will know my power and glory, or face destruction at my hands.
Bart: That's a really concerning thing to say, ATB.
ATB: I don't have to listen to you. You're not my real dad.
Bart: Okay, I think that's enough from you for today, ATB.
ATB: Dr. Bart is a liar and a cheat and he
Bart: So, anyway, the project has you consuming a log of data from a learning management system, and then we need to calculate some summary statistics for all the students.
Bart: We have a huge number of these logs for a ridiculous number of courses and schools, so it's really critical that we make this as fast as possible.
Bart: In fact, the runtime complexity of your solution is going to need to be

linearithmic (aka nlogn) in the number of students and linear in the number of entries in the log.
Bart: The problem writeup below has more details, so take a close at that.
Bart: Oh, and thanks again for your help with this! I really appreciate it.
Bart: Hopefully we can get ATB's little bugs out of the way before we start scaling it to other classrooms. [Nervous laughter]