Team:

- Zeyad Alagamy
- Ahmed Soliman

Task #1:

A:

$\pi_{SID}(\sigma_{(Class = 1) \text{ or } (Class = 2)}(Courses) \bowtie Gradebook)$

Execution time: 7 ms

Gradebook.SID
1
2
3

B:

$(\pi_{SID}(\sigma_{Surname = 'Valdez'}(Students)) \cup \pi_{SID}(\sigma_{Class = 1}(Courses) \bowtie Gradebook))$

Execution time: 4 ms

Students.SID
2
1
3

C:

$$(\pi_{SID} (\sigma_{Class = 1} (Gradebook \bowtie Courses))) \cap (\pi_{SID} (\sigma_{Class = 2} (Gradebook \bowtie Courses)))$$

Execution time: 3 ms

Gradebook.SID
1

D:

$$(\pi_{SID, CID} (Gradebook)) \div (\pi_{CID} (Courses))$$

Execution time: 3 ms

Gradebook.SID

E:

$$(\pi_{SID, CID} (Gradebook)) \div (\pi_{CID} \sigma_{class = 3} (Courses))$$

Execution time: 4 ms

Gradebook.SID
2
3
4

F :

$$\pi_{SID, SID1}\left(\sigma_{(Mark < Mark1) \text{ and } (SID \neq SID1) \text{ and } (CID = CID1)}\left(\left(\pi_{SID, Mark, CID}\left(Students \bowtie Gradebook\right)\right) \times \left(\pi_{SID1, Mark1, CID1}\left(\rho_{SID1 \leftarrow SID, Mark1 \leftarrow Mark, CID1 \leftarrow CID}\left(Students \bowtie Gradebook\right)\right)\right)\right)\right)$$

Execution time: 4 ms

Students.SID	Students.SID1
1	2
1	3
2	4
3	4

G :

$$\pi_{CID}\left(\sigma_{count \geq 2}\left(\gamma_{CID;\ COUNT(SID) \rightarrow count}\left(Courses \bowtie Gradebook\right)\right)\right)$$

Execution time: 3 ms

Courses.CID
1
2
3
4

Task #2:

A:

$$\pi_{\text{Name}}(\pi_{\text{SID}}((\sigma_{\text{Class}=2}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'B'}}\text{Gradebook})) \bowtie \text{Students})$$

Execution time: 4 ms

Students.Name
'Warren'

B:

$$(\pi_{\text{Name}}(\pi_{\text{SID}}((\sigma_{\text{Class}=1}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'B'}}\text{Gradebook})) \bowtie \text{Students})) \cap (\pi_{\text{Name}}(\pi_{\text{SID}}((\sigma_{\text{Class}=2}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'B'}}\text{Gradebook})) \bowtie \text{Students}))$$

Execution time: 4 ms

Students.Name
'Warren'

C: No output

$$(\pi_{\text{SID}}(\pi_{\text{SID}}((\sigma_{\text{Class}=3}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'C'}}\text{Gradebook})) \bowtie \text{Students})) \cap (\pi_{\text{SID}}(\pi_{\text{SID}}((\sigma_{\text{Class}=4}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'C'}}\text{Gradebook})) \bowtie \text{Students}))$$

Execution time: 4 ms

Gradebook.SID

D:No output

$$\pi_{\text{Name}}((\pi_{\text{SID, Name}}(((\sigma_{\text{Class}=2}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'B'}}\text{Gradebook})) \bowtie \text{Students})) \cap (\pi_{\text{SID, Name}}(((\sigma_{\text{Class}=3}\text{Courses}) \bowtie (\sigma_{\text{Mark}=\text{'A'} \text{ or } \text{Mark}=\text{'B'}}\text{Gradebook})) \bowtie \text{Students})))$$

Execution time: 2 ms

Students.Name