CS 640 Principles of Database Management and Use Winter 2013

Today: Discussion about (Materialized) Views

Goldstein and Larson: **Optimizing Queries Using Materialized Views: A Practical, Scalable Solution**. *SIGMOD 2001*.

Example Schema

- Student(ID, Name, Age, Uni)
- Project(ID, Name, StartDate, CoordUni)
- Equipment(ID, Type, ProductionDate, Price)
- Use(SID, PID, EID)

Example Query

- Student(ID, Name, Age, Uni)
- Project(ID, Name, StartDate, CoordUni)
- Equipment(ID, Type, ProductionDate, Price)
- Use(SID, PID, EID)

Q: SELECT S.ID, S.Name, E.ID, StartDate – ProductionDate AS EAge
FROM Student S, Project, Equipment, Use
WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
AND Price > 500 AND Age < 25</p>

Example View

- Student(ID, Name, Age, Uni)
- Project(ID, Name, StartDate, CoordUni)
- Equipment(ID, Type, ProductionDate, Price)
- Use(SID, PID, EID)
- V1: SELECT S.Name AS Name, EID, Price FROM Student S, Project, Equipment, Use WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Uni = 'University of Waterloo' AND Uni = CoordUni AND Price > 1000

V1: SELECT S.Name AS Name, EID, Price
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
 AND Uni = 'University of Waterloo'
 AND Uni = CoordUni AND Price > 1000

V1: SELECT S.Name AS Name, EID, Price FROM Student S, Project, Equipment, Use WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Uni = 'University of Waterloo' AND Uni = CoordUni AND Price > 1000

V1 may not contain all rows required for Q

V2: SELECT S.Name AS Name, EID, Price FROM Student S, Project, Equipment, Use WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Uni = 'University of Waterloo' AND Price > 1000

V2: SELECT S.Name AS Name, EID, Price FROM Student S, Project, Equipment, Use WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Uni = 'University of Waterloo' AND Price > 1000

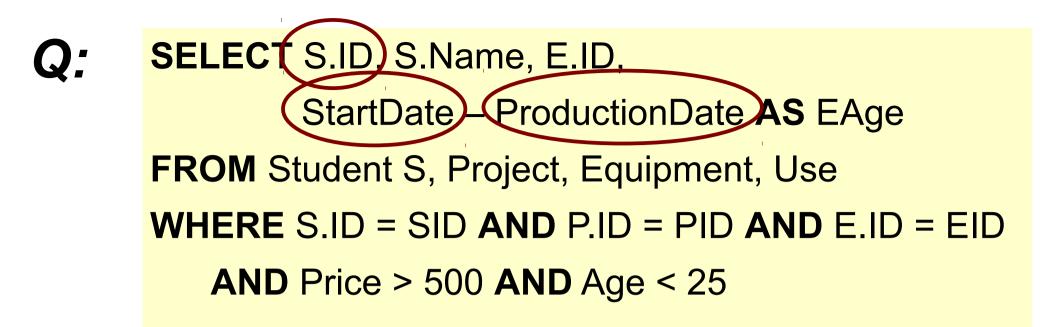
V2 may not contain all rows required for Q

V3: SELECT S.Name AS Name, EID, Price
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
 AND Price > 100

V3: SELECT S.Name AS Name, EID, Price
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
 AND Price > 100

V3 cannot be used to select all required rows for Q

V4: SELECT S.Name AS Name, EID, Price, Age
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
 AND Price > 100



V4: SELECT S.Name AS Name, EID, Price, Age
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
 AND Price > 100

V4 cannot be used to compute all output expressions of Q

 V4: SELECT S.Name AS Name, EID, Price, Age, SID, StartDate, ProductionDate
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Price > 100

 V4: SELECT S.Name AS Name, EID, Price, Age, SID, StartDate, ProductionDate
 FROM Student S, Project, Equipment, Use
 WHERE S.ID = SID AND P.ID = PID AND E.ID = EID AND Price > 100

Q': SELECT SID, Name, EID, StartDate – ProductionDate AS EAge FROM V4 WHERE Price > 500 AND Age < 25