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
```

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
```

Q:

```
SELECT S.ID, S.Name, E.ID,
                StartDate – ProductionDate AS EAge
FROM Student S, Project, Equipment, Use
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V1 may not contain all rows required for *Q*

Q:

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SELECT S.ID, S.Name, E.ID,
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FROM Student S, Project, Equipment, Use
WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
    AND Price > 500 AND Age < 25
```

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
```

Q:

```
SELECT S.ID, S.Name, E.ID,
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V2:

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SELECT S.Name AS Name, EID, Price
FROM Student S, Project, Equipment, Use
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```

V2 may not contain all rows required for *Q*

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
```

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
```

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
```

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*

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
```

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
```

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
```

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*

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
```

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
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SELECT S.ID, S.Name, E.ID,
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FROM Student S, Project, Equipment, Use
WHERE S.ID = SID AND P.ID = PID AND E.ID = EID
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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
```