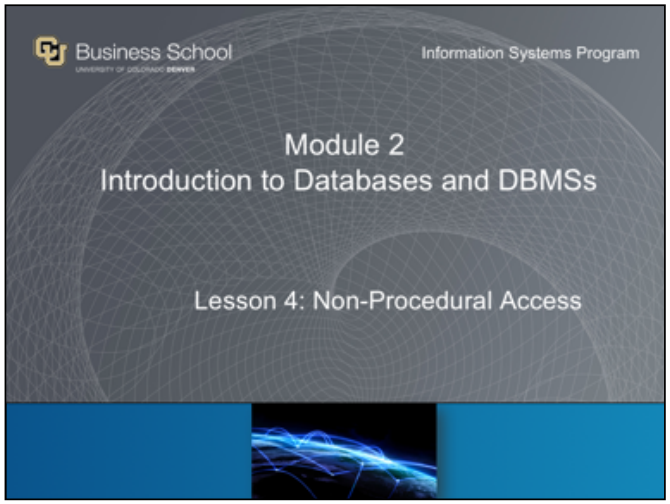
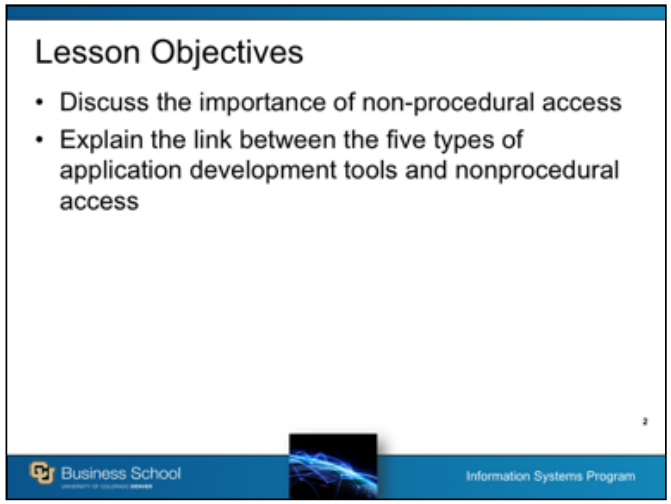


Welcome to Lesson 4 of Module 2 on the Introduction to Databases and DBMSs

- Covers non-procedural access, the most important feature of a DBMS
- Database management systems are vital technology to modern organizations

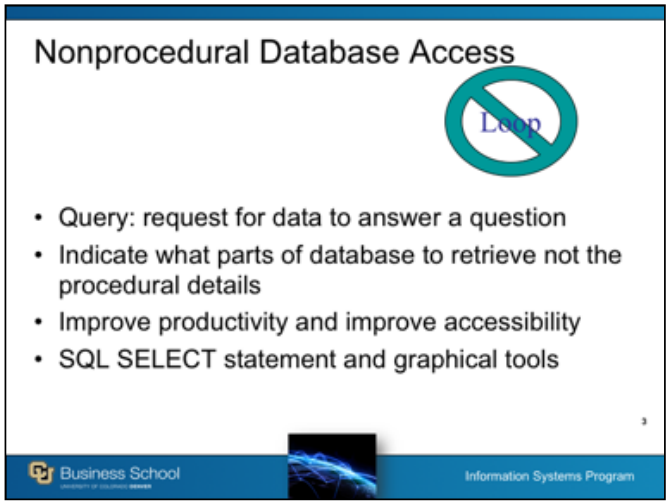
Opening question:

- What is the most labor intensive part of software development? Coding loops
- How many orders of magnitude improvement of development time from non procedural access?



Tools

- Database language
- Visual query tool
- Form development tool
- Report development tool
- Embedded database language inside a host programming language

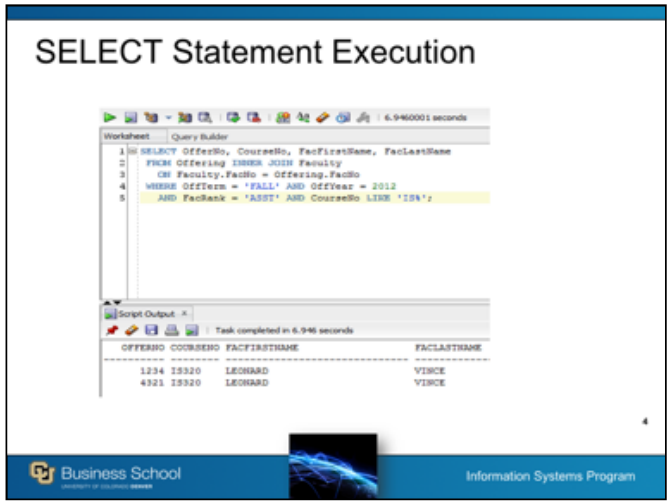


Specify what not how

Loop buster: no loops; major difference between procedural and nonprocedural language

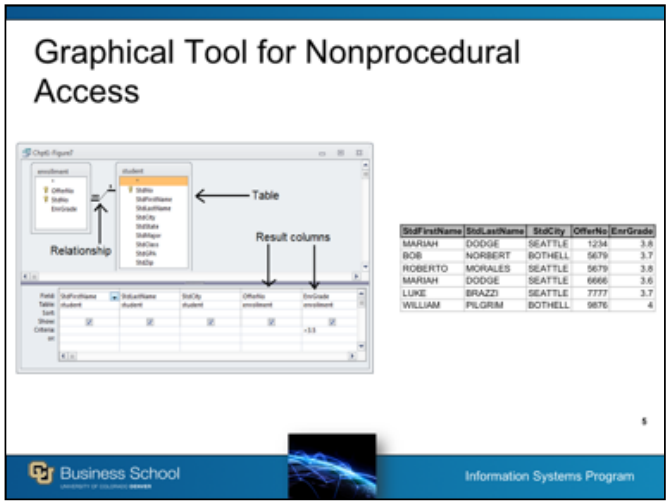
Trip planning analogy: specify features of trip (destination, quality of accommodations, dates, …) but not details (route, hotel research, flight research, …)

Productivity improvement: 100 times fewer lines of code



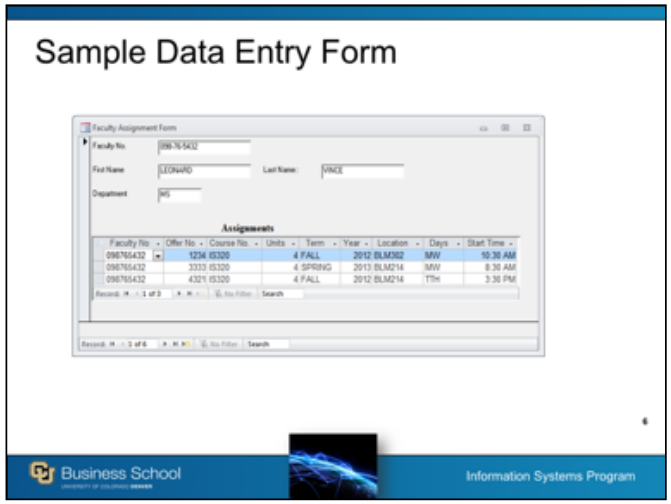
Execution of SELECT statement in the SQL Developer

Combining the Offering and Faculty tables



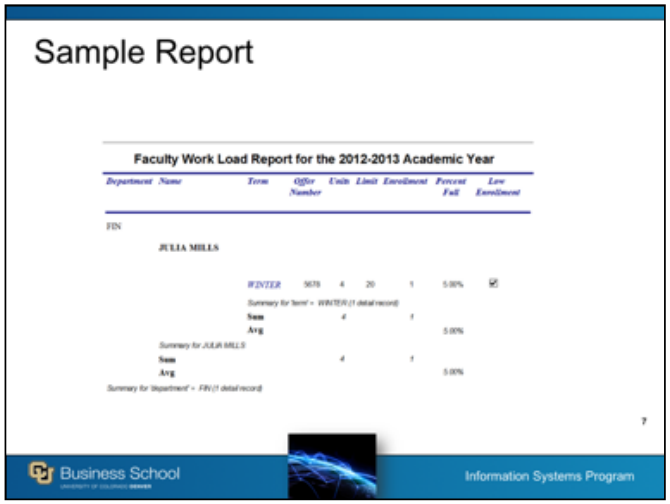
Query Design (Access)

- specify tables and columns
- Access determines connections among tables



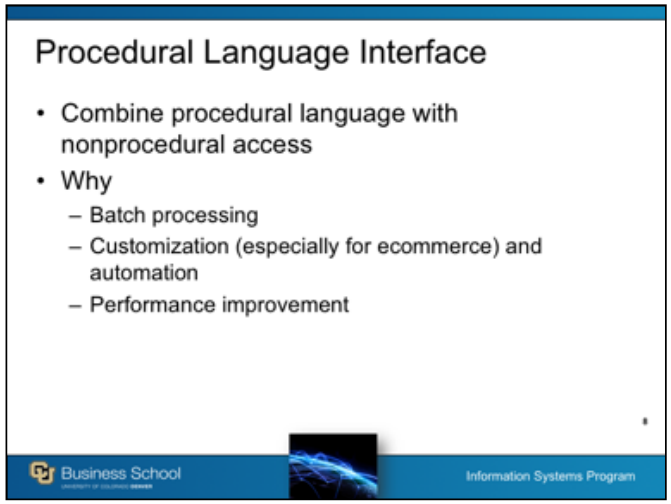
Faculty assignment form

The form can be used to add new course assignments for a professor and to change existing assignments.



May need revision

The report uses indentation to show courses taught by faculty in various departments. The indentation style can be easier to view than the tabular style shown as default output style.



Combine external languages (COBOL, Java, C, C++, …) with SQL

New DBMS specific languages: PL/SQL (Oracle), Transact-SQL (SQL Server)

Batch processing: much business processing is batch (collect loan applications and process together); online processing is becoming more prevalent because of the web;

Customization: customize the behavior of a data entry form

Automation: rule processing; check qoh when an order is placed

Performance: more control with a procedural language

Summary

- Database technology vital to modern organizations
- Crucial DBMS feature: nonprocedural access
- Query language, visual tool, form tool, report tool, and embedding
- Fundamental skill: query formulation

DBMS are very complex products

Devote many years to understand a particular product

Learn fundamental skill of query formulation

Detailed skill that requires lots of practice

Use standard database language (SQL) in week 2

Sample SELECT Statement and Result

SELECT statement

```
SELECT OfferNo, CourseNo, FacFirstName, FacLastName
 FROM Offering INNER JOIN Faculty
   ON Faculty.FacNo = Offering.FacNo
 WHERE OffTerm = 'FALL' AND OffYear = 2012
   AND FacRank = 'ASST' AND CourseNo LIKE 'IS%';
```

Execution result

```
OFFERNO COURSENO FACFIRSTNAME          FACLASTNAME
------- -------- -------------------- --------------------------
   1234 IS320    LEONARD              VINCE
   4321 IS320    LEONARD              VINCE
```


Combining the Offering and Faculty tables