SQL, PL/SQL

FALL Semester 2013

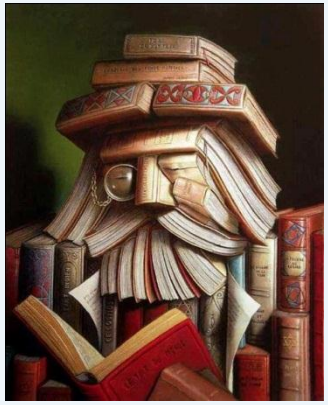
Rana Umer Aziz
MSc.IT (London, UK)

Contact No. 0335-919 7775

enquire@oeconsultant.co.uk

PRESTON UNIVERSITY

EDUCATION CONSULTANT



Contact No. 0335-919 7775,

0321-515 3403

www.oeconsultant.co.uk

PRESTON UNIVERSITY

Book

SQL, PL/SQL The Programming Language of Oracle

Third Edition By

Ivan Bayross

Course Outline

- Chapter 1 Database Concepts
- Chapter 2 Installation of Oracle 9i
- Chapter 3 Post Installation Steps
- Chapter 5 A Business Model for Retail Banking
- Chapter 7 Interactive SQL
- Chapter 11 SQL Performance Tuning
- Chapter 12 Security Management Using SQL
- Chapter 14 Advance Features in SQL * Plus
- Chapter 15 Introduction to Pl/SQL
- Chapter 18 PL/SQL Database Objects

Terminal Exam Required 8 Question out of 12

PRESTON UNIVERSITY

What is Memory?

What is Store?

What is Knowledge?

What is Base?

What is Data?

What is Information?

What is Database?

How you recall the Data/Information

PRESTON UNIVERSITY

What is Management?

What is System?

What is Relationship/Relation?

What is Summarize/Normal/Simple?

PRESTON UNIVERSITY

What is Communication?

What is Language?

What is Database Language?

PRESTON UNIVERSITY

Database

A Database is collection of meaningful Data that is organized so that it can easily be accessed, managed, and updated.

PRESTON UNIVERSITY

Database Management System

- A Database Management System (DBMS) is a program that lets one or more computer users create and access Data in a Database.
- The DBMS Manages User Requests
  - Where the data is physically located & Build on storage media.
  - Make sure the Security & Access Privileges.
  - Relationship between Database.

DBMS are, SQL Server, Oracle, Sysbase , MySQL, MS-Access & So many more….

PRESTON UNIVERSITY

DBMS Benefits

- Redundancy can be reduced.
- Inconsistencies
- Shard Data
- Standards
- Integrity (Accuracy And Consistency Data Stored)
- Security
- Independence (Multiple use)

PRESTON UNIVERSITY

Relational Database

- A Relational Database is a collection of Data items organized as a set of formally-described Tables from which data can be accessed or re-assembled in many different ways without having to re-organize the Database Tables.
- The Relational Database was invented by Edgar. F. Codd at IBM in 1970.

Relational DBMS

- RDBMS stores data in the form of related tables.
- Requires few assumption
  - How data is related
  - How it will be extracted from Database(Viewed in many ways)
- Single Database can be spread across several tables.

PRESTON UNIVERSITY

DBMS V/S RDBMS

DBMS	RDBMS

• Relationship between two tables or files maintained by programmed.
• Dose not Support Client/Server Architecture.
• Dose not Support Distributed Databases
• No much Secure
• Each Tables is given as extension in DBMS
• Naming Conventions
  • Field
  • Record
  • File
	• Relationship between two tables or files can be specified at the time of table creation.
	• RDBMS Supports Client/ Server
	• Support Distributed Databases
	• More Secure
	  • Logging at O/S level
	  • Command Level
	  • Object level
	• Many Tables are grouped in one database in RDBMS.
	• Naming Conventions
	  • Column, Attributes
	  • Row, Tuple , Entity
	  • Table, Relation, Entity Class

PRESTON UNIVERSITY

Database Keys

A key is a field that you use to sort data. It can also be called a *key field*

There are three main types of keys,

1. Primary keys
2. Foreign keys.
3. Candidate keys

Database Keys

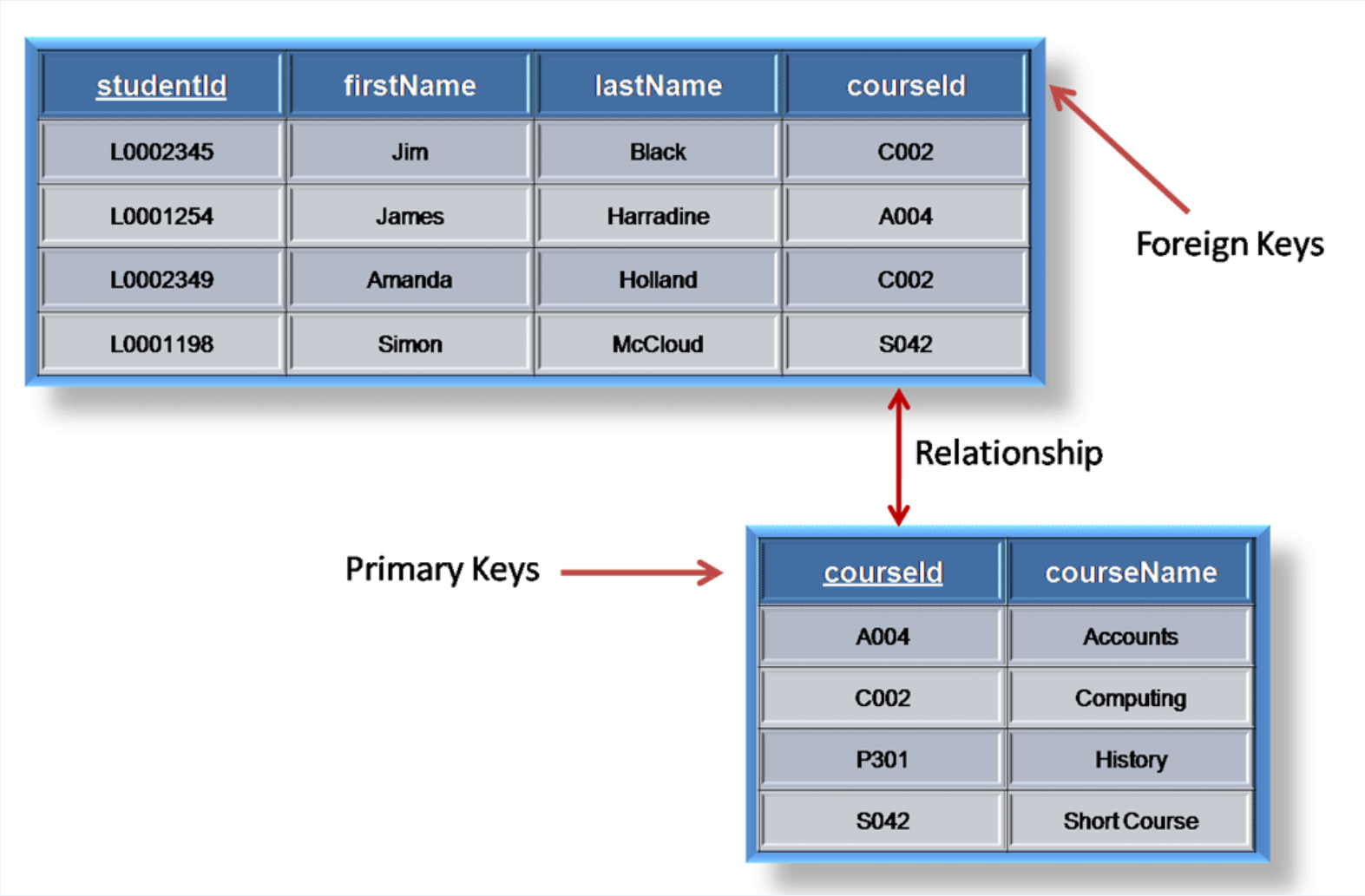
Primary keys

Primary Keys

StudentId	firstName	lastName	courseId
L0002345	Jim	Black	C002
L0001254	James	Harradine	A004
L0002349	Amanda	Holland	C002
L0001198	Simon	McCloud	S042
L0023487	Peter	Murray	P301
L0018453	Anne	Norris	S042

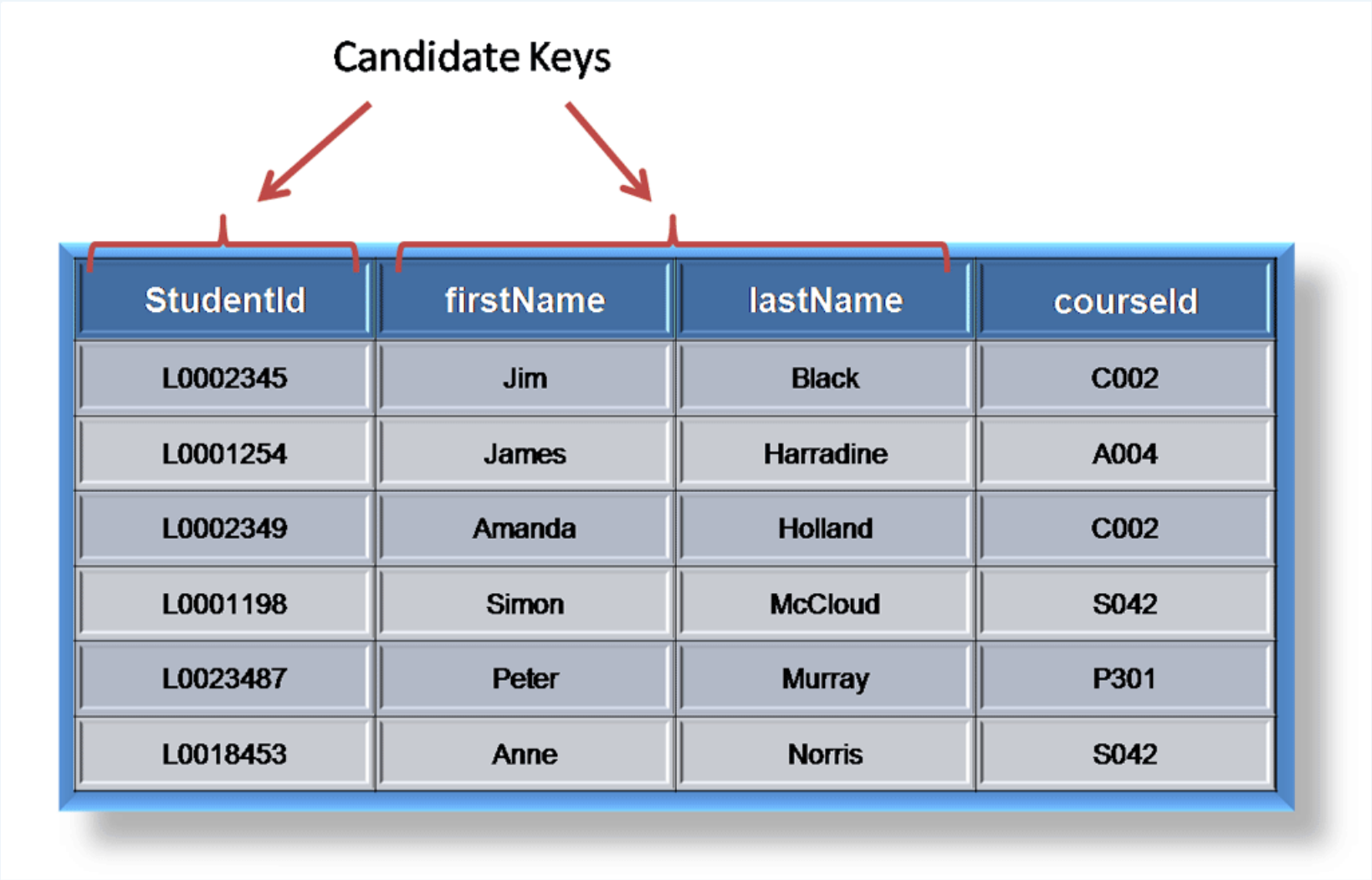
Database Keys

Foreign keys



Database Keys

Candidate keys



StudentId	firstName	lastName	courseId
L0002345	Jim	Black	C002
L0001254	James	Harradine	A004
L0002349	Amanda	Holland	C002
L0001198	Simon	McCloud	S042
L0023487	Peter	Murray	P301
L0018453	Anne	Norris	S042

PRESTON UNIVERSITY

Database Keys

Some others Keys,

- Alternate Key
- Compound Key (Easily Handled In Live Forms)
- Composite Key (Composite primary keys are generated when no PK (primary key) is designated in the database at time of import)
- Bothe keys consists of more than one field to uniquely identify a record.

PRESTON UNIVERSITY

What are the issues we have?

Emp No	Employee Name	Time Card No	Time Card Date	Dept No	Dept Name
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	115	11/09/2002	20	Marketing
99	Janice Smitty			10	Accounting
500	Alan Cook	107	11/02/2002	50	Shipping
500	Alan Cook	107	11/02/2002	50	Shipping
700	Ernest Gold	108	11/02/2002	50	Shipping
700	Ernest Gold	116	11/09/2002	50	Shipping
700	Ernest Gold	116	11/09/2002	50	Shipping

PRESTON UNIVERSITY

Database Normalization

Database Normalization is the process of removing Redundant Data from your tables in to improve storage efficiency, data integrity, and scalability (function in well manor)

There are three normal forms:

- 1NF
- 2NF
- 3NF.

3NF is widely considered to be sufficient for most applications.

PRESTON UNIVERSITY

First Normal Form

Title	Author1	Author 2	ISBN	Subject	Pages	Publisher
Database System Concepts	Abraham Silberschatz	Henry F. Korth	0072958863	MySQL, Computers	1168	McGraw-Hill
Operating System Concepts	Abraham Silberschatz	Henry F. Korth	0471694665	Computers	944	McGraw-Hill

PRESTON UNIVERSITY

Database Normalization

1st Normal Form

- Each field contains the smallest meaningful value
- No Repeating Groups
- All the key attributes are define.
- All attributes are dependent on Primary Key

PRESTON UNIVERSITY

First Normal Form

Title	Author	ISBN	Subject	Pages	Publisher
Database System Concepts	Abraham Silberschatz	0072958863	MySQL	1168	McGraw-Hill
Database System Concepts	Henry F. Korth	0072958863	Computers	1168	McGraw-Hill
Operating System Concepts	Henry F. Korth	0471694665	Computers	944	McGraw-Hill
Operating System Concepts	Abraham Silberschatz	0471694665	Computers	944	McGraw-Hill

PRESTON UNIVERSITY

Database Normalization

2nd Normal Form

- Its should be in 1st Normal Form
- It include no partial dependencies on its Primary Key

Database Normalization

2nd Normalization

Publisher Table

Publisher_ID	Publisher Name
1	McGraw-Hill

Book Table

ISBN	Title	Pages	Publisher_ID
0072958863	Database System Concepts	1168	1
0471694665	Operating System Concepts	944	1

PRESTON UNIVERSITY

Database Normalization

3rd Normal Form

- Should be in 2nd Normal Form
- Records do not depend on anything other than a table's primary key

Third Normal Form

Subject Table

Subject_ID	Subject
1	MySQL
2	Computers

Author Table

Author_ID	Last Name	First Name
1	Silberschatz	Abraham
2	Korth	Henry

Book Table

ISBN	Title	Pages	Publisher
0072958863	Database System Concepts	1168	McGraw-Hill
0471694665	Operating System Concepts	944	McGraw-Hill

PRESTON UNIVERSITY

Database Normalization

Convert it up to 3rd Normal Form

Emp No	Employee Name	Time Card No	Time Card Date	Dept No	Dept Name
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	106	11/02/2002	20	Marketing
10	Thomas Arquette	115	11/09/2002	20	Marketing
99	Janice Smitty			10	Accounting
500	Alan Cook	107	11/02/2002	50	Shipping
500	Alan Cook	107	11/02/2002	50	Shipping
700	Ernest Gold	108	11/02/2002	50	Shipping
700	Ernest Gold	116	11/09/2002	50	Shipping
700	Ernest Gold	116	11/09/2002	50	Shipping

PRESTON UNIVERSITY

Normalize form

Employee, Department, and Time Card Data in Three Tables

Table: Employees

EmpNo	EmpFirstName	EmpLastName	DeptNo
10	Thomas	Arquette	20
500	Alan	Cook	50
700	Ernest	Gold	50
99	Janice	Smitty	10

Table: Departments

DeptNo	DeptName
10	Accounting
20	Marketing
50	Shipping

Table: Time Card Data

TimeCardNo	EmpNo	TimeCardDate
106	10	11/02/2002
107	500	11/02/2002
108	700	11/02/2002
115	10	11/09/2002
116	700	11/09/2002

Primary Key

PRESTON UNIVERSITY

Language

SQL (Structured Query Language) 1970 by IBM

- SQL is used to communicate with a database.
- It is the standard language for Database Management Systems.

- SQL*Plus is the most basic Oracle Database utility, with a basic command-line interface, commonly used by users, administrators, and programmers.

- PL/SQL (Procedural Language /SQL) is an extension to SQL, incorporating many if the design features of programming languages.

PRESTON UNIVERSITY

SQL (Structured Query Language)

Components of SQL:

DDL (Data Definition Language)
DML (Data Manipulation Language)
DCL (Data Control Language)
DQL (Data Query Language)

PRESTON UNIVERSITY

SQL (Structured Query Language)

Components of SQL:

DDL (Data Definition Language)

Create, Alter , Drop, Grant…

DML (Data Manipulation Language)

Insert, Update , Delete, …

DCL (Data Control Language)

Commit, Rollback, Savepoint, …

DQL (Data Query Language)

Select Retrieve data from the database

PRESTON UNIVERSITY

Database Administrator

A **Database Administrator** (**DBA**) is a person responsible for the

- Installation
- Configuration
- Upgrade
- Administration
- Monitoring
- Maintenance of Databases in an organization.

Database Administrator

A **Data Administrator** (**DA**) is a person responsible for the

- Defining Data elements
- Data names and their relationship
- How to install and configure the RDBMS applications
- Find out the requirements of the software application in terms of functions and assure the data integrity.
- They are also known as Data Analyst.

Discuss Preston Attendance System…