

A thick black L-shaped frame is positioned on the left and bottom edges of the slide, framing the central text.

# DATABASE DESIGN & IMPLEMENTATION

ICT Skills

# Objectives

- Create a table using the data types available in Oracle databases.
- Number, date, character, timestamp and timestamp with time zone.

# Purpose

- Different types of data have different types of characteristics, the purpose of which is to efficiently store data.

# Data Types

- Each value manipulated by Oracle has a data type.
- A value's data type associates a fixed set of properties with the value.
- These properties cause the database to treat values of one data type differently from values of another data type.
- Columns of a single data type produce consistent results.
- A DATE columns always produces date values.
- You cannot insert the wrong type of data into a column.
- Each column can only hold one data type.

# Data Types

- The most commonly used column data types for character and number values:
- For Character values:
  - *CHAR (fixed size, maximum 2000 characters)*
  - *VARCHAR2 (variable size, maximum 4000 characters)*
  - *CLOB (variable size, maximum 128 terabytes)*
- For number values:
  - *NUMBER (variable size, maximum precision 38 digits)*

# Data Types

- Most commonly used data types for date, time and binary values:
- For date and time values:
  - *DATE*
  - *TIMESTAMP*
  - *INTERVAL*
- For binary values (eg. Multimedia, JPG, WAV, MP3, etc)
  - *RAW* (variable size, maximum 2000 bytes)
  - *BLOB* (variable size, maximum 128 terabytes)

# Data Types

- For character values it is usually better to use VARCHAR2 or CLOB than CHAR, because it saves space.
- For example an employees last name is 'Chang'
  - *In a VARCHAR2(30) column only 5 characters are stored.*
  - *In a CHAR(30) column, 25 trailing spaces are also stored.*
- Number values can be negative and positive.
  - *NUMBER(6,2) can store any value from +999.99 down to -999.99*

# Data Types

- The DATE data type stores a value of century down to whole seconds.
- '21/Aug/2003 17:25:30' is valid
- The TIMESTAMP data type is an extension of DATE which allows for fractions of a second.
- TIMESTAMP(3) allows for 3 digits after the whole seconds.
- TIMESTAMP WITH TIME ZONE stores a time zone value as a displacement from Universal Coordinated Time or UCT (previously GMT).
- '21/Aug/2003 08:00:00 -5:00' means 8:00 am 5 hours behind UTC.
- TIMESTAMP WITH LOCAL TIME ZONE works slightly different that it will automatically convert the time to the USERS time zone when the date value is viewed.



# Data Types

- INTERVAL data types store the elapsed time, or interval of time between two date time values.
- INTERVAL YEAR TO MONTH stores a period of time measured in years and months.
- INTERVAL DAY TO SECOND stores a period of time measured in days, hours, minutes and seconds.