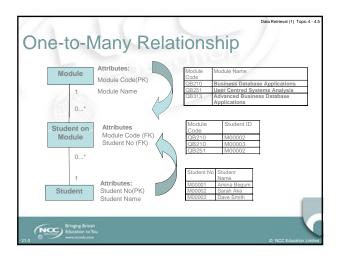
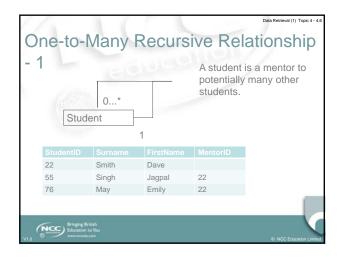


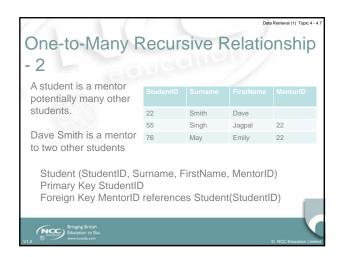
### Scope and Coverage This topic will cover: • Table and view structure in a relational database • Data types • Null values • Retrieving data using SQL

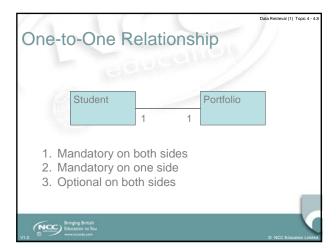
## Learning Outcomes By the end of this topic students will be able to: Implement more complex relationships Describe how to retrieve data from one or more tables using SQL Recognise and identify different data-types in SQL

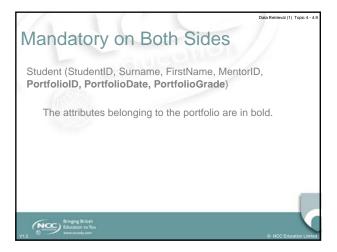




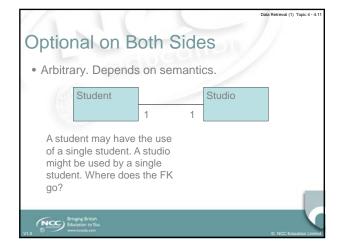


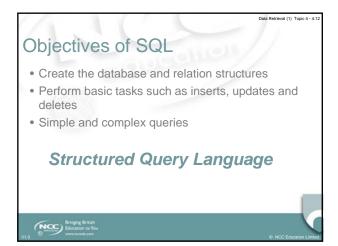






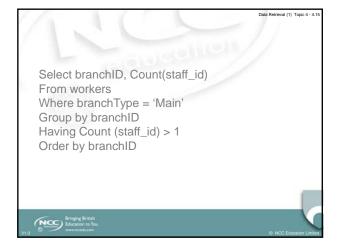
# Mandatory on one Side of 1:1 Entity that has optional participation is designated parent entity. Student (StudentID, Surname, FirstName, MentorID, PortfolioID) Portfolio(PortfolioID, PortfolioDate, PortfolioGrade)

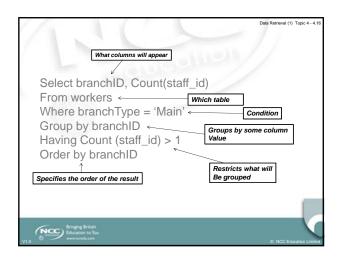


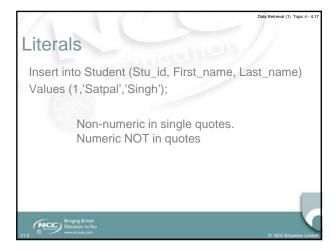


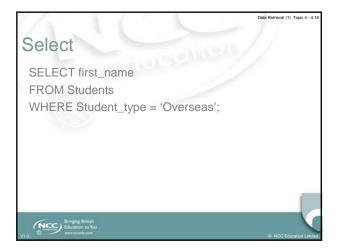
# Data Definition Language DDL For defining database structures and controlling access to data CREATE TABLE, CREATE INDEX, CREATE SEQUENCE, GRANT ACCESS etc. Data Manipulation Language DML For retrieving and updating data SEECT, INSERT, UPDATE, DELETE

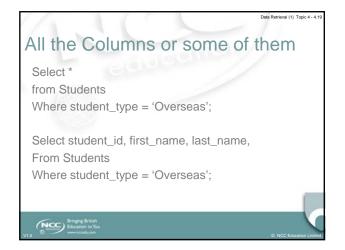
## Data Manipulation Language DML For retrieving and updating data SELECT INSERT UPDATE DELETE

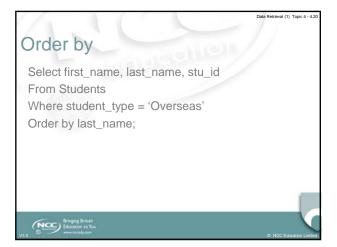


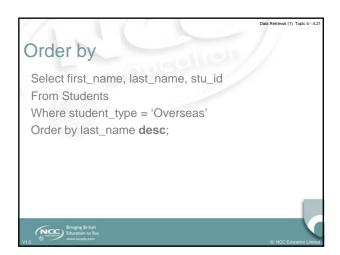












# Aggregate Functions - 1 Count Sum Avg Min Max Bringing Brish Education Livial Co NCC Education Limited

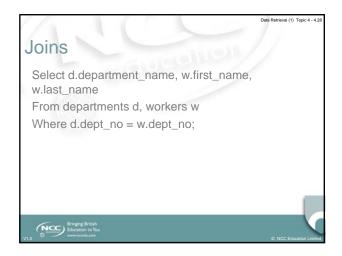
## Aggregate Functions - 2 Count – returns number of values in a column Sum – returns the sum total of values of a column Avg – returns the mean average of values in column Min – returns the lowest value in a column Max – returns the highest value in a column

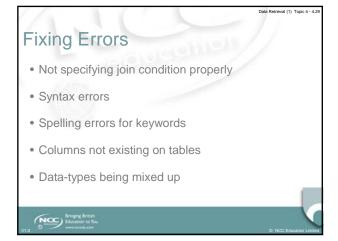
### Example of Aggregate Function Select branchID, Count(staff\_id) From workers Where branchType = 'Main' Group by branchID Having Count (staff\_id) > 1 Order by branchID This counts the number of members of staff in main branches where there are more than 1 staff. It groups them by the branchID.

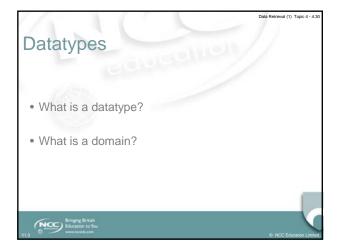
#### 

### Having Clause Modifies the group by clause Select branchID, Count(staff\_id) From workers Where branchType = 'Main' Group by branchID Having Count (staff\_id) > 1 Order by branchID In this case only selecting groups where it has been calculated by the count function that there are more than one member of staff.

## Sub-Queries Select d.department\_name, d.location From departments d, workers w Where d.dept\_no = w.dept\_no And w.age = (select max(w2.age) From workers w2);



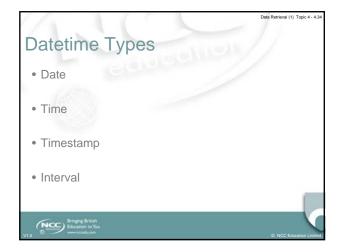


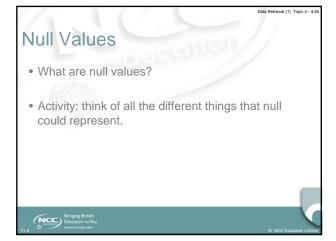


# String Datatypes Character or Char Varying Character of Varchar Bit (N) Senging British Linear Bringing British Linear British Li

## Char or Varchar • 'Gary\_' a 6 long Char • 'Gary' a 6 long varchar

## Numeric Datatypes Numeric or Decimal e.g. 8.23 with point set Integer e.g. 8 Float e.g. 8.23 but could also be changed so that point moves when needed Propriet Fresh Integer Reserved (1) Tope 4-4.33





### Learning Outcomes By the end of this topic students will be able to: Implement more complex relationships Describe how to retrieve data from one or more tables using SQL Recognise and identify different data-types in SQL

# References Connolly, T. and Begg, C. (2004) Database Solutions: A step-by-step guide to building database, 2<sup>nd</sup> Edition Addison-Wesley - Chapters 9 and 10 Connolly, T. and Begg, C. (2004). Database Systems: A Practical Approach to Design, Implementation, and Management, 4<sup>th</sup> Edition. Addison Wesley - Chapters 5, 6 and 7 Benyon-Davies, P. (2003). Database Systems, 3<sup>rd</sup> Revised Edition. Palgrave Macmillan – Chapters 11, 12 and 13 Dietrich, Suzanne W, (2001) Understanding Relational Database Query Languages - Chapter 5

