# 结构化查询语言

# COMPUTING: Software Development

## HIGHER NATIONAL DIPLOMA

【英】苏格兰学历管理委员会（SQA）
Scottish Qualifications Authority

## Unit Student Guide

## Introduction to SQL DG8G 04

中国时代经济出版社

SCOTTISH QUALIFICATIONS AUTHORITY

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结构化查询语言

Introduction to SQL

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# Contents

# 1 Introduction to the Scottish Qualifications Authority

This Unit DG8G 04 Introduction to SQL has been devised and developed by the Scottish Qualifications Authority (SQA). Here is an explanation of the SQA and its work:

The SQA is the national body in Scotland responsible for the development, accreditation, assessment, and certification of qualifications other than degrees.

Its website can be viewed on: www. sqa. org. uk

SQA's functions are to:

- devise, develop and validate qualifications, and keep them under review
- accredit qualifications
- approve education and training establishments as being suitable for entering people for these qualifications
- arrange for, assist in, and carry out, the assessment

of people taking SQA qualifications

- quality assure education and training establishments which offer SQA qualifications

- issue certificates to candidates.

In order to pass SQA units, students must complete prescribed assessments. These assessments must meet certain standards.

The Unit Specification outlines the three outcomes that students must complete in order to achieve this unit. The Specification also details the knowledge and/or skills required to achieve the outcome or outcomes. The Evidence Requirements prescribe the type, standard and amount of evidence required for each outcome or outcomes.

# 2 Introduction to the Unit

## 2.1 What is the Purpose of this Unit?

This Unit is designed to develop a broad knowledge of the concepts, principles, boundaries and scope of relational databases using a query language. These will be reinforced by developing the practical skills required in using the structures and features of a query language in order to maintain and interrogate a relational database management system. The SQL constructs used adhere to the current standards, so will be applicable in all SQL-based platforms. It forms part of an HN group award programme, although it can also be used as a stand-alone Unit by candidates wishing to acquire and develop skills using a query language.

## 2.2 What are the Outcomes of this Unit?

There are three outcomes in this Unit:

1. Create and maintain a data storage system
2. Manipulate data stored within a table structure
3. Produce formatted reports.

## 2.3 What do I Need to be Able to do in Order to Achieve this Unit?

Access to this Unit will be at the discretion of the Centre; however it is recommended that you have basic practical PC skills, and an understanding of the role and application of databases.

This can be evidenced by having achieved Units such as HN Unit DG8P 04: Computer Operating Systems 1, HN Unit DG8W 04: Systems Development: Introduction and also HN Unit DG8N 04: Information Technology: Applications Software 1. Alternatively, the Unit can be delivered on a stand-alone basis to candidates interested in learning and using a query language. In these cases, you should have practical work experience and some appreciation of the role and application of relational database management systems.

## 2.4 Approximate Study Time for This Unit

While the exact time allocated to this Unit is at the discretion of the centre, the notional study time is 40 hours.

## 2.5 Equipment/ Material Required for this Unit

In order to participate in the Unit, you will require individual access to a personal computer or workstation, which will include suitable RDBMS software. This Unit has been written for the database system Oracle (from Oracle Corporation). However, your tutor may advise use of an alternative such as DB2 (from IBM).

## 2.6 Symbols Used in this Unit

The various Learning Materials sections are designed so that you can work at your own pace, with tutor's support. As you work through the Learning Materials (see Section 5), you will encounter symbols. These symbols indicate that you are expected to do a task. **These tasks are not Outcome Assessments.** They are exercises designed to consolidate learning or encourage thought, in preparation for the Outcome Assessment (see Section 3 - Assessment Information for this Unit).

**Activity 1**

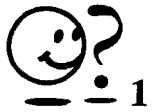
This symbol indicates an Activity (A). Usually, activities are used to improve or consolidate your understanding of the subject in general or a particular feature of it.

In this unit, you are asked to undertake activities, which take the form of practical exercises, making use of the provided database environment.

Suggested responses to these activities can be found in Section 7 — Solutions to Self-Assessed Questions and Activities. You may have alternative solutions, which may be just as valid. Some activities do not have a suggested response. This is the case where the response is already covered by a previous response.

The activities will not serve this purpose if you refer to the responses prior to having attempted the Activity.

Self-Assessed Question




This symbol indicates a Self-Assessed Question. Using a Self-Assessed Question helps you check your understanding of the content that you have already covered. The Self-Assessed Questions in this guide will often take the form of written answers or discussions with your colleagues.

Everything is provided for you to check your own responses. Answers to the Self-Assessed Questions are to be found at the back of the Unit Student Guide. Where suggested responses to activities are provided in the Unit Student Guide, **students are strongly discouraged from looking at these responses before they attempt the activity.** The activities throughout the Unit Student Guide will help you to prepare yourself for the formal assessments, and to identify topic areas in which you will require clarification and additional tutor support. The activities will not serve this purpose if you look at the answers before trying the activity!

Self- Assessed Questions and activities are designed to be checked by you. No tutor input is necessary at this stage unless special help is requested, although from time to time your tutor may wish to view your responses to Self-Assessed Questions to see how you are progressing.

# 3 Assessment Information for this Unit

## 3.1 What Do I Have to Do to Achieve This Unit?

In order to achieve this Unit you are required to complete a single case study. This case study is an open book practical consisting of three assessments covering the three outcomes above.

At each stage you will be producing written evidence in the form of printouts. Your progress will be monitored to demonstrate knowledge and skills have been acquired.

Stage 1:
Outcome 1 is assessed by the creation and modification of tables and the insert of data in those tables.

Stage 2:
Outcome 2 is assessed by the creation and execution of a series of queries against the contents of the tables created in stage 1.

Stage 3:
Outcome 3 is assessed by the creation and execution of reports based on the contents of the tables created in stage 1.

# 4 Suggested Lesson Plan

The Learning Materials (see Section 5) are designed to lead you through a series of activities which will allow you to consolidate your learning and check on your own progress.

Although a notional 40 hours is suggested to complete this Unit, you may wish to spend further time to research the subject. To aid in this process, a suggested reading list and websites can be found in Section 6.

Outcome 2 forms the major part of this Unit and, consequently, will take longer to complete.

A suggested division of the notional 40 hours for this Unit is: Outcome 1 (10 hours), Outcome 2 (20 hours), Outcome 3 (10 hours), including the assessments for each outcome. However, this is not rigid, and you may find in practice a different distribution is preferred.

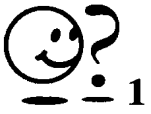
# 5 Learning Materials

## Introduction to SQL

### What is SQL or, to give it its full name, 'Structured Query Language'?

To understand that we need to look into the history of databases over the past few decades.

A database is a collection of records stored on some media. Storage in the past has included punch cards, paper tape, magnetic tapes and disks. Previously, different sections in a company would have their own copies of data. So, for example, there could be multiple copies of employee details held by the Human Resources (HR), Pensions and Salaries sections.




What problems does holding multiple copies of data cause?

Spend a few moments writing down your thoughts and then discuss them within your class.

**Check your answers in Section 7 — Solutions to Self-Assessed Questions and Activities — but, don't look yet.**

The storage media used also added to the problems of maintenance and retrieval of data.

Data stored on a magnetic tape requires a sequential search to find and change information. So, for example, let's assume we have a database of employee details, stored on magnetic tape, in order of surname. To access the details of Mr John Williams would require reading many records before getting to the one required. The introduction of magnetic disks resolved that problem by allowing random access to data. Further, there were different methods for storing data. You may have come across flat-file and hierarchical database systems. Although, these are outside the scope of this Unit, it is sufficient to know that they had their own set of problems.

In the late 60s a mathematician Dr E. F. Codd was working for the IBM San Jose Research Laboratory. He