Portfolio of Evidence

Databases

Aligned to SAQA US 114049, 115373, 114048, 115367

Learner Summative Assessment &

PoE Guide

Demonstrate an understanding of sort and search techniques used in computer programming

Learner Name and Surname: _____

Learner ID Number: _____

Company / Branch:_____

Date:_____

Learner Signature:_____

Assessor Registration Number:_____

SAQA ID 114049
Demonstrate an understanding of Computer Database Management Systems
NQF Level 5, 7 Credits

SAQA ID 115373
Demonstrate an understanding of sort and search techniques used in computer programming
NQF Level 5, 6 Credits

SAQA ID 114048
Create database access for a computer application using structured query language
NQF Level 5, 9 Credits

SAQA ID 115367
Demonstrate logical problem solving and error detection techniques
NQF Level 5, 8 Credits

Table of Contents

Foreword to the Learner

The purpose of this guide is to provide the learners with process and requirements of successfully completing and submitting a Portfolio of Evidence for assessment against the unit standards of this module

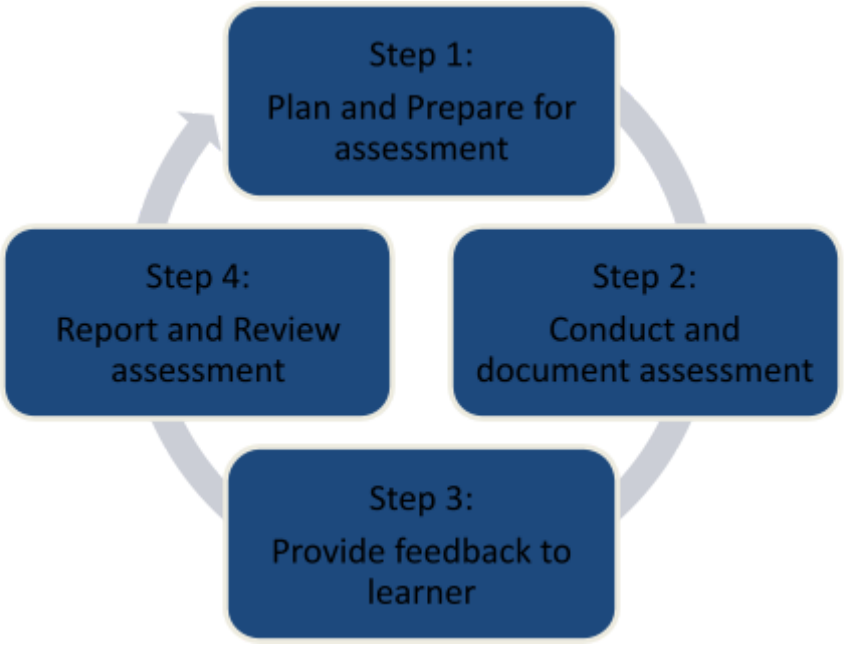
Assessment in Outcomes Based Education is not only focused on what learners can do but intends to develop learners holistically. In other words, learners are also required to demonstrate certain life-skills, which will not only enhance their learning, but will also ensure that these skills are transferable to their private lives.

In Outcomes-based education and training we use both formative and summative assessments:

- **Formative assessment** refers to assessment that takes place during the process of learning and teaching.
- **Summative assessment is** assessment for making a judgement about achievement. This is carried out when a learner is ready to be assessed at the end of a programme of learning.

Results initially collected for formative assessment, can be used for summative assessment, thus avoiding repetition.

Assessment Process



Assessment Process Steps

Step 1: **Plan and prepare or the assessment**	**Documents**
The Assessor needs to: • Understand and review all the requirements of the assessment in terms of evidence required to prove competence • Identify logistical arrangements that have to be made such as the venue • Familiarise him/herself with assessment instruments and tools • Identify him/herself with assessment instruments and tools • Identify and prepare any resources required for assessment, such as equipment, people and other resources for the assessment • Ensure that s/he is familiar with the related policies – Assessment, Moderation, RPL and Appeals policy **The Learner needs to:** • Be informed of, and agreement reached over: the requirements for the assessment; the roles and responsibilities of the learner with regard to his/her assessment; the special needs of the learner)and how these can be accommodated) and how the evidence is to be collected; and also guided in preparing for assessment by the facilitator and/or assessor as per the Pre-Assessment Preparation Sheet criteria and then complete and sign the document in agreement with the assessment process • Be given the contact details of the facilitator, assessor and any other support person from the training provider, for possible future assessment process assistance needs • Be guided in planning for the assessment by the facilitator and/or assessor as per the Assessment Plan criteria and then complete and sign the document in agreement with the assessment plan that s/he created • Be guided in understanding of the requirements of authenticity as per the Declaration of Authenticity form by the facilitator and/or assessor and then complete and sign the document in agreement with the authenticity requirements in the assessment process • Be guided in understanding the Appeals Policy and Procedure, as well as the Appeals form by the facilitator and/or assessor and then complete and sign the declaration of understanding on the Appeals Procedure form • Be given answers to any assessment process related questions	• *Unit Standard* • *Curriculum, Strategy & Alignment Document* • *Assessment guide* • *Assessment Strategy & process* • *Assessment related policies* • *Assessment feedback document* • *Assessment preparation checklist* • *Learner Guide* • *Learner Portfolio of Evidence* • *Pre-Assessment Preparation Sheet* • *Assessment Plan* • *Declaration of Authenticity* • *Declaration of understanding the Appeals Procedure* • *Learner ID, CV and certificates* • *Declaration of formative development* • *Knowledge questions* • *Practical activity for completion in the workplace* • *Witness testimony for supervisor observation and feedback* • *Logbook*
Step 2: **Conduct and record the assessment**	**Documents**
The Assessor needs to: • Conduct the assessment in an appropriate and non-threatening manner and/or environment and use the assessment principles when assessing the evidence • Review and assess the evidence as submitted by the learner/candidate in their Learner Portfolio of Evidence	• Unit Standard • Learner PoE guide submitted for assessment • Assessment Guide

guide, by referring to the Assessment Guide for guidelines and where applicable, model answers (although in applied competence model answers are to be interpreted in terms of the learners' workplace and environment and should not be the only guide. Subject matter expertise to be the input in assessment of evidence): o Declare and confirm that formative development took place and that the learner was made ready for summative assessment o Knowledge questions o Practical activity completed in the workplace o Witness testimony and logbook completed in the workplace ● Make a judgment about the evidence against the criteria of the unit standard in the Final Assessment Recording, using the principles of good evidence as a guideline ● Record the assessment process undertaken and the assessment findings and decisions taken in the required format on the specific documentation in the Assessment Feedback document: o Assessment Checklist o Evaluation Report o Overall Assessment Report o Assessment practices review and declaration ● When learners have to undergo re-assessment, they have to be given feedback so that they can concentrate on areas of weaknesses and only be re-assessed on NYC criteria. Re-assessment should comply with the following conditions: o Re-assessment should take place in the same situation or context and under the same conditions o The same method and assessment instrument may be used, but the task and materials should be changed, depending on the QMS requirements of the training provider	● Assessment Feedback documents: o Evaluation Report o Overall Assessment Report o Assessment practices review and declaration
Step 3: **Provide assessment feedback to the learner**	**Documents**
The Assessor needs to: ● Provide the learner feedback about the assessment conducted: o Provide feedback in both a positive and constructive manner o Advise/inform the learners of outstanding and/or required evidence ● Record all communication with the learner **The Learner needs to:** ● Confirm receipt, understanding and acceptance of the feedback by completing and signing the declaration in the Assessment Outcome section of the Assessment Feedback document	● Assessment Feedback/outcome documentation
Step 4: **Review and report on the assessment**	**Documents**

The Assessor needs to: • Review the assessment process and report on it using the Assessment practices review and declaration	• Assessment Feedback/outcome documentation
The Learner needs to: • Review the assessment process by completing the Assessment practices review and declaration	
The Training Provider needs to: • Record the outcome of the assessment in the relevant quality management system database/matrix • Record and/or submit the assessment results to the NLRD (National Learner Records Database) of the relevant ETQA • Submit the specific number of learner portfolios for moderation, as per the training provider QMS • Release the results of assessment to the relevant learner stakeholders, e.g. HR, mentor, supervisor; agreed to by the learner • Manage any learner appeals against the assessment outcome, according to the Appeals Policy and Procedure • All the documents or copies thereof, as prescribed previously, must be kept on file as part of the learner portfolio of evidence • Learner's portfolios of evidence must be readily available for internal and external moderation and verification by the appropriate practitioners, until after the ETQA verification process has taken place. The portfolios of evidence may then be kept (storage) or returned to the learner according to the training provider's QMS	• Training Provider specific QMS document for: o Record of assessment submitting the results to the NLRD o Moderation • Learner assessment result release

The Assessment Process Role-players

The assessment team consists of the following people that each has a specific tole and responsibilities to fulfil:

Learner

Learners will participate in the facilitated classroom training section of the learning programme by participating in formative assessment class activities/exercises in the learner guide and report on it accordingly to reflect formative development and readiness for summative assessment.
The leaner needs to:

- Attend the learning/training session
- Participate in the learning and form part of syndicate group/small workgroup for activities
- Do research and prepare for participation during the training session
- Complete the assignments, activities and portfolio

Learners will complete and submit their individual Portfolios of Evidence, using the Learner Portfolio of Evidence Guide to successfully create, gather and submit the required evidence for assessment, by completing the following:

- Required administration documentation
- Formative development declaration
- Individual assignments and practical workplace activities:
    - Knowledge questions
    - Practical workplace activity
    - Witness testimony – supervisor confirmation of application of the knowledge and skills in the workplace
    - Assessment activities checklist – control checklist to ensure all required evidence is submitted by the learner

Assessments are meant to be as clear and transparent as possible, therefore learners should know:

- The kinds of assessment activities that they would be asked to perform
- The standard and level of performance expected
- The type and amount of evidence to be collected
- Their responsibility regarding the collection of evidence

Facilitator

It is the role of the facilitator to facilitate the theoretical classroom training and skills practice sessions to groups of learners

The facilitator is also responsible for:

- Being available for questions regarding the assessment after the training had been completed
- Acting as Evidence Collection Facilitator, when facilitating formative assessment using the class activities in the learner guide
- Facilitating only a section of the summative assessment – knowledge questions in the learner Portfolio of Evidence Guide
- Guiding the learners on the use of the Portfolio of Evidence Guide
- Learning programme administration, e.g. attendance register, training report after the session, and any other related administration required by the Training Provider

Assessor

The Assessor needs to be:

- Qualified as an assessor
- Registered as a constituent assessor with the relevant SETA
- Proficient in the subject matter of the learning area in which they are assessing and an expert in his/her knowledge of the unit standard requirements or qualification for which s/he is registered to assess – the

assessor's subject matter knowledge should be at least a level higher that the learner who is being assessed
- Proficient in the process of assessment – this means that they should:
    - Be familiar with the unit standards that they will be assessing
    - Be familiar with and use the assessment guides
    - Plan the assessment, which includes the selection, design and implementation of assessment activities
    - Follow the assessment process, i.e. plan and agree on the assessment with the learner; guide the learner in the collection of evidence; conduct the assessment; provide feedback to the learner about the assessment decision
    - Record and report on assessment results
    - Participate in moderation processes
    - Review the assessment and make appropriate changes

The assessor needs to conduct an assessment subject to the following principles:

- The application of NQF principles
- The application of the principles of credible assessment
- The application of the principles of the collection of and quality of the evidence
- The assessment being planned and designed on the basis of understanding the requirements of the unit standard, part qualification or qualification that the learner is seeking credit for

The assessor needs to establish a trusting relationship with learners – not only so that they can perform optimally during an assessment, but also so that the learners will trust that the assessor has their interests at heart

Moderator

Internal moderators will be moderating assessment activities and supporting the assessors. Their tasks will be to do the quality assurance of the assessment activities in an ordered and structured way and develop the skills of assessors.

Moderation ensured that people who are being assessed are assessed in a consistent, accurate and well-designed manner. It ensures that all assessors who assess a particular unit standard or qualification are using comparable assessment methods and are making similar and consistent judgements about learners' performance.

The moderator needs to be:

- Qualified as a moderator
- Registered as constituent moderator with the relevant SETA
- Experienced in the related field of assessment and moderation

The moderator will, according to the QMS of the provider:

- Moderate 25% of all portfolios within the agreed time period after assessment, as per the requirements stated in the training providers QMS

- Validate the quality of the judgements made. The judgment is either confirmed or overturned on valid grounds

Verifier

The moderation system will in turn be quality assured by the ETQAs who have qualified verifiers in place who will have to monitor the moderation systems and support moderators accordingly.

Training Provider

The training provider needs to ensure that qualified facilitators, assessors and moderators are employed or contracted to perform the required functions, using quality materials as is required in the training provider QMS.
The training provider also needs to provide for the appeals process. If the learner/candidate is not happy about the process or findings of the assessment, s/he can put in an appeal to have the assessment reviewed by the training provider. This will ensure that candidates have a democratic right to overturn decisions that are not fair, not properly motivated or simply not believed. The training provider and ETQA should ensure that there is an appeals procedure in place, i.e. appeals against an assessment decision. Learners should be secure in the knowledge that they can appeal against an unfair assessment.

Competent vs. Not Yet Competent

Learners being assessed are not allocated a percentage (for example 55%) on completion of the learning. Rather, they are either deemed competent or not yet competent.

Training is delivered using an outcome-based style of teaching and learning. Learners drive the process of learning and educators need to facilitate the creation of learning opportunities.

Once a learner has demonstrated his/her competence through an assignment, task, exam or performance, then s/he is awarded the credits related to that competence.

However, learners deemed not yet competent, are either given another chance to prove competence, or they are re-trained, or they are encouraged to move into a different field of learning.

Requirements for being deemed Competent

Each unit standard indicates the requirements or standards of competence. These are written as assessment criteria. In an outcome-based system learner need to meet ALL these requirements before being deemed competent. However, SAQA has recommended that assessments be weighted according to the purpose of the qualification toward which the learner is learning.

Assessments are therefore designed around the requirements that are stated in the assessment criteria and are therefore criterion-based. In a curriculum-based system, assessments were made around the norm of a group and were therefore norm- referenced.

A criterion-based assessment can only be performed using evidence that has been generated by the Learner. Types of evidence include direct evidence, indirect evidence and historic evidence:

- **Direct** – this is evidence that is collected directly by the assessor, for instance an assessor finding out whether you can bake a cake will watch you while you do it.
- **Indirect** – this is evidence that you have collected, signed off as authentic and submitted for assessment. For instance, a video of you baking a cake.
- **Historic** – this is evidence of your competence – as assessed by someone else. A certificate of competence issued to you when you completed a course is an example of historic evidence. Documents that you produced while doing a job (usually a few years ago) could also be historic evidence.

Evidence has to meet certain criteria. These criteria are summarised as **VARCS**:

- **V** is for **Valid**: the unit standard or qualification being assessed must require evidence that is submitted for assessment. Otherwise it is not

important and cannot be used to find out whether you are competent or not.

- **A** is for **Authentic**: evidence that you submit must be your own work. Group work cannot be submitted as your own work because not only you worked on it.
- **R** is for **Reliable**: the evidence must be from a reliable source. A certificate of competence issued by a provider that is not accredited could be regarded as unreliable.
- **C** is for **Current**: the evidence must demonstrate that your competence is current. It doesn't help that you were able to run a 12 km race 5 years ago – can you still do it today? Currency is also related to the technology that is used to demonstrate competence. It is not relevant whether you are able to boil water using a pot on a stove when electric kettles are the current method used to boil water.
- **S** is for **Sufficient**: the unit standards have several assessment criteria that need to be satisfied. The evidence must satisfy all the criteria or else it is not sufficient.

However, evidence is collected using some kind of instrument. These instruments take different forms. Some instruments include questionnaires, interview schedules, simulations, role-play, observation checklists and products.

Note to the Learner

Dear
Learner,

You have opted to undergo assessment and as a result have been presented with this PoE (Portfolio of Evidence). Please go through all sections of this PoE very carefully before submission and make sure that you have included all the information and evidence requested. **Please take note of the following:**

Unit Standard:
A copy of the unit standard has been included. The assessment has been designed in order to meet all requirements as set by this unit standard.

Pre-Assessment Preparation Sheet:
The first step towards completing this PoE is to read through the Pre-Assessment Preparation Sheet. This form contains valuable background information. Your assessor will not be able to assess your portfolio if you have not read and signed this document.

Assessment Plan:
You can use the assessment plan to write down the dates on which you plan to meet specific targets.

Declaration of Authenticity:
Please complete the declaration of authenticity to declare that the evidence that you submit in this PoE is your own work, with the exception of those that you list in the section provided. Your assessor will not be able to assess your portfolio if you have not read, completed and signed this document.

Appeals Procedure and Form
Familiarise yourself with the appeals procedure and sign the document as requested. You will only use the Appeals Form if you would like to appeal against the assessment decision.

Assessment Instruments:
By completing the assessment instruments, you will generate / gather the evidence required to meet the outcomes of the unit standard(s). Please follow instructions carefully for both the formative and summative assessments.

Assessment Activities Checklist
As part of the quality management process used by the training provider and the SETA, the learner and his/her supervisor are required to check and sign off that all activities have been completed and submitted in the PoE. Please complete this form, before submitting your PoE.

Learner's Review of the Assessment Process
As part of the quality management process used by the training provider and the SETA, the learner is required to provide feedback to the training provider about the assessment process. Please complete this form, before submitting your PoE.

Please note that you are welcome to contact your facilitator / assessor at any stage should you have any questions pertaining to the assessment.

Evaluation Report

Learner Name and Surname: _____

Learner ID Number: _____

Date of 1st Assessment: _____

Date of Re-Assessment: _____

Assessor Name: _____

Assessor Registration Number: _____

Date of Moderation: _____

Moderator Name: _____

Moderator Registration Number: _____

Specific Outcomes		1st Assessment Meets Requirements YES	1st Assessment Meets Requirements NO	Re-Assessment Meets Requirements YES	Re-Assessment Meets Requirements NO
US 115367: Demonstrate an understanding of Computer Database Management Systems (NQF 5, 7 Credits)					
SO 1	Describe data management issues and how it is addressed by a DBMS.				
SO 2	Describe commonly implemented features of commercial database management systems				
SO 3	Describe different type of DBMS`s.				
SO 4	Review DBMS end-user tools.				
US 115373: Demonstrate an understanding of sort and search techniques used in computer programming (NQF 5, 6 Credits)					
SO 1	Demonstrate an understanding of how abstract data types are stored on computers.				
SO 2	Demonstrate an understanding of sort techniques used to sort data held in data structures.				
SO 3	Demonstrate an understanding of search techniques.				

Specific Outcomes		1st Assessment Meets Requirements YES	1st Assessment Meets Requirements NO	Re-Assessment Meets Requirements YES	Re-Assessment Meets Requirements NO
US 114048: Create database access for a computer application using structured query language (NQF 5, 9 Credits)					
SO 1	Review the requirements for database access for a computer application using SQL				
SO 2	Design database access for a computer application using SQL.				
SO 3	Write program code for database access for a computer application using SQL.				
SO 4	Test programs for a computer application that accesses a database using SQL.				
SO 5	Document programs for a computer application that accesses a database using SQL				
US 115367: Demonstrate logical problem solving and error detection techniques (NQF 5, 8 Credits)					
SO 1	Describe different approaches to problem solving.				
SO 2	Use logical operators in descriptions of rules and relationships in a problem situation.				
SO 3	Simplify Boolean expressions with Boolean algebra and Karnaugh maps.				
SO 4	Describe the basic concepts of error detection.				
Critical Cross-Field Outcomes					
Identifying					
Working with others					
Organising oneself and others					
Collecting information and or data for use					
Communicating effectively with others					
Use science and technology effectively					
Demonstrating and understanding of the world as a related system					
Contributing to effectiveness of self and others					

Overall Assessment Feedback

Assessor Signature: _____

Date: _____

Moderator Signature: _____

Date: _____

Overall Assessment Report

Assessment Decision: 1st Assessment

The candidate has submitted evidence that is valid, relevant, current, sufficient and authentic against the listed specific outcomes and covered all range statements

YES	NO

DECLARATION OF OVERALL COMPETENCY

Having considered all the applicable assessment criteria, the candidate is declared:

Competent	
Not Yet Competent	

The candidate has not met the following specific outcomes and its assessment criteria

_____

_____

_____

_____

The candidate needs to take the following action in order to achieve competence, as indicated

_____

_____

_____

_____

Assessor Signature: _____

Date: _____

Moderator Signature: _____

Date: _____

Assessment Decision: Re-Assessment

The candidate has submitted evidence that is valid, relevant, current, sufficient and authentic against the listed specific outcomes and covered all range statements

YES	NO

DECLARATION OF OVERALL COMPETENCY

Having considered all the applicable assessment criteria, the candidate is declared:

Competent	
Not Yet Competent	

RE-ASSESSMENT FEEDBACK

_____

_____

_____

Assessor Signature: _____

Date: _____

Moderator Signature: _____

Date: _____

Assessment practices review and declaration

Review & declaration	Leaner		Assessor		Comments
	YES	NO	YES	NO	
Were the assessment and related practices structured?					
Was the process of assessment made clear?					
Was the plan for assessment realistic?					
Did the facilitator provide guidance on how to complete the Portfolio of Evidence?					
Were special needs considered?					
Were all documentation for assessment made available?					
Was the assessment valid?					
Do you consider the assessment to be sufficient and fair?					
Was the assessment free from ambiguity?					
Could all assessment activities be completed?					
Were any of the assessment activities interrupted?					
Was the process of assessment managed well?					
Did the assessor provide sufficient feedback?					
Was the feedback constructive?					
Did you understand how to remediate, if applicable?					
Did the facilitator provide guidance on the collection of evidence?					
Were copies of the unit standards made available?					
Was a copy of the assessment plan made available?					
Did the pre-assessment meeting take place?					
Were you informed that you will be entitled to one assessment and one re-assessment, after which you will be charged additional assessment fees?					
Was a timeframe negotiated for the submission of the PoE, and were potential barriers addressed?					
Were you informed about your right to appeal an assessment decision and the procedure thereof?					

I, the leaner, herewith declare that:

I am NOT SATISFIED with the assessor's feedback provided	
I am SATISFIED & ACCEPT the assessment decision and have not objections nor further questions, relating to this particular assessment	
I am aware that 25% of all assessments are moderated, according to policy and that this may have an effect on this assessment judgment	

Learner Signature: _____

Date: _____

Assessor Signature: _____

Date: _____

Moderator Signature: _____

Date: _____

Portfolio of Evidence

Please complete the following documents and submit as part of your Portfolio of Evidence:

1. Learner's Personal Information form	
2. Learner ID, CV and Qualifications	
3. Unit Standard Details	
4. Assessment Contract document	
5. Declaration of Authenticity document	

Learner's Personal Information

Please provide the following information for SAQA National Learner Database. The following page provides the information form codes:

Learner's Last Name:_____

Learner's First Name:_____

Learner Title:_____

Learner birth date (YYYYMMDD):_____

ID Number (attach a copy of ID)**:**_____

Equity:_____

Nationality:_____

Gender:_____

Home Language:_____

Employment Status:_____

Disability:_____

Learner Home Address:_____

_____

_____

Learner Postal Address:_____

_____

Province:_____

_____

Contact Details

Telephone:_____

Cell phone:_____

E-mail:_____

Fax:_____

_____

Company Details

Company Name:_____

Contact Person (Supervisor)**:**_____

Contact Person Contact Number:_____

Postal Address:_____

Learner's Designation:_____

Date of Submission:_____

Learner ID

*Insert a **certified** copy of your Identify Document here:*

Learner CV

Insert a copy of your full CV (Curriculum Vitae) here:

Learner Qualifications

Insert certified copies of relevant qualifications here:

Unit Standard Details

SAQA ID
114049
Unit Standard Title
Demonstrate an understanding of Computer Database Management Systems
NQF Level
5
Credits
7
Registration Start Date
2018-07-01
Registration End Date
2023-06-30
Purpose

This unit standard is intended:

- To provide a fundamental knowledge of the areas covered
- For those working in, or entering the workplace in the area of Information Technology
- As additional knowledge for those wanting to understand the areas covered

People credited with this unit standard are able to:

- Describe data management issues and how it is addressed by a DBMS.
- Describe commonly implemented features of commercial computer DBMS`s
- Describe different type of DBMS`s
- Review DBMS end-user tools

The performance of all elements is to a standard that allows for further learning in this area.

Range
N/A

Specific Outcome 1: Describe data management issues and how it is addressed by a DBMS..	
Assessment Criterion 1	The description identifies the problem they represent and includes examples.
Assessment Criterion 2	The description outlines ways which database management systems address the issues.
Specific Outcome 2: Describe commonly implemented features of commercial database management systems	
Assessment Criterion 1	The description identifies the purpose of each feature.
Assessment Criterion 2	The description identifies the way in which each feature contributes to the solution of data management issues.
Specific Outcome 3: Demonstrate an understanding of search techniques.	
Assessment Criterion 1	The description describes characteristics of the DBMS-type.
Assessment Criterion 2	The description gives examples of the use of the DBMS-type.

Specific Outcome 4:
Review DBMS end-user tools.

Assessment Criterion 1	The review identifies the features and limitations of the tools.
Assessment Criterion 2	The review outlines the interaction between the tools and the database.
Assessment Criterion 3	The review is based upon use of the tools.

Essential Embedded Knowledge

- Performance of all elements is to be carried out in accordance with organisation standards and procedures, unless otherwise stated. Organisation standards and procedures may cover: quality assurance, documentation, security, communication, health and safety, and personal behaviour. An example of the standards expected is the standards found in ISO 9000 Certified Organisations.
- Performance of all elements complies with the laws of South Africa, especially with regard to copyright, privacy, health and safety, and consumer rights.
- All activities must comply with any policies, procedures and requirements of the organisations involved, the ethical codes of relevant professional bodies and any relevant legislative and/ or regulatory requirements.

Critical Cross-field Outcomes

Working
Work effectively with others as a member of an organisation.

Organising
Organise and manage him/her self and his/her activities responsibly and effectively.

Collecting
Collect, analyse, organise, and critically evaluate information.

Science
Use science and technology effectively and critically, showing responsibility towards the environment and health of others.

Demonstrating
Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

Contributing
Contribute to his/her full personal development and the social and economic development of the society at large by being aware of the importance of: reflecting on and exploring a variety of strategies to learn more effectively, exploring education and career opportunities and developing entrepreneurial opportunities.

SAQA ID
115373

Unit Standard Title
Demonstrate an understanding of sort and search techniques used in computer programming

NQF Level
5
Credits
6
Registration Start Date
2018-07-01
Registration End Date
2023-06-30
Purpose
People credited with this unit standard are able to:

- Demonstrate an understanding of how abstract data types are stored on computers
- Demonstrate an understanding of sort techniques used to retrieve data held in data structures
- Demonstrate an understanding of search techniques used to retrieve data held in data structures
- The performance of all elements is to a standard that allows for further learning in this area

Range
N/A

Specific Outcome 1: Demonstrate an understanding of how abstract data types are stored on computers.	
Assessment Criterion 1	The demonstration identifies different abstract data types used in computer programming.
Assessment Criterion 2	The demonstration identifies different data structures used to store abstract data types in a computer.

Specific Outcome 2: Demonstrate an understanding of sort techniques used to sort data held in data structures.	
Assessment Criterion 1	The demonstration identifies different types of sort techniques
Assessment Criterion 2	The demonstration explains the working of different types of sort techniques
Assessment Criterion 3	The demonstration explains typical problems found with sorting of data

Specific Outcome 3: Demonstrate an understanding of search techniques.	
Assessment Criterion 1	The demonstration identifies different types of search techniques.
Assessment Criterion 2	The demonstration explains the working of different types of search techniques.
Assessment Criterion 3	The demonstration explains typical problems found with searching of data.

Essential Embedded Knowledge

- Performance of all elements should be performed with a solid understanding of the use of multi-dimensional arrays and abstract data structures.
- Performance of all elements should be performed with a knowledge of Pseudo code or a programming language, to demonstrate the techniques covered.

Critical Cross-field Outcomes

Identifying
Identify, solve problems and make decisions in relation to the current systems development environments

Organising
Organise and manage him/her self and his/her activities responsibly and effectively

Communicating
Communicate effectively using visual, mathematical and or language skills in the modes of oral and/ or written persuasion when engaging with systems development

Demonstrating
Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exists in isolation

Contributing
Contribute to his/her full personal development and the social and economic development of the society at large by being aware of the importance of: reflecting on and exploring a variety of strategies to learn more effectively, exploring education and career opportunities and developing entrepreneurial opportunities

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SAQA ID
114048
Unit Standard Title
Create database access for a computer application using structured query language
NQF Level
5
Credits
9
Registration Start Date
2018-07-01
Registration End Date
2023-06-30
Purpose

This unit standard is intended:

- To provide advanced knowledge of the areas covered.
- For those working in, or entering the workplace in the area of Computer Operations.

People credited with this unit standard are able to:

- Review requirements for database access for a computer application using SQL.
- Design database access for a computer application using SQL.
- Write program code for database access for a computer application using SQL.
- Test programs for a computer application that accesses a database using SQL.
- Document programs for a computer application that accesses a database using SQL.

The performance of all elements is to a standard that is expected in a professional environment.

Range

N/A

Specific Outcome 1: Review the requirements for database access for a computer application using SQL	
Assessment Criterion 1	The review identifies and explains the feasibility of the requirements.
Assessment Criterion 2	The review identifies the database access objectives and critical performance factors.
Assessment Criterion 3	The review estimates the development effort required so that the cost may be estimated.
Assessment Criterion 4	A review procedure is adopted, which ensures that the outcomes meet the database access requirements.
Specific Outcome 2: Design database access for a computer application using SQL.	
Assessment Criterion 1	The design implements user requirements.
Assessment Criterion 2	The design of the database structure resembles the output from the data analysis.
Assessment Criterion 3	The structure of each table in the database adheres to the third normal form.
Assessment Criterion 4	The methods of accessing the data are identified.
Assessment Criterion 5	The key relationships between the tables within the database are identified. (Range: "CREATE TABLE", "DROP TABLE", "ALTER TABLE" statements.)
Assessment Criterion 6	The data types for primary and foreign keys are consistent throughout the database.
Specific Outcome 3: Write program code for database access for a computer application using SQL.	
Assessment Criterion 1	The program code implements the program design.
Assessment Criterion 2	The program code uses language constructs that facilitate the understanding of the code.
Assessment Criterion 3	The program code utilises the optimising features of the languages being used.
Assessment Criterion 4	The program code uses language instructions that facilitate the understanding op the code.
Assessment Criterion 5	The program code uses language constructs that facilitate the understanding of the code.
Assessment Criterion 6	Tables joined in a query are essential to its outcome.
Assessment Criterion 7	The program code uses constructs that preserve the integrity of the data being accessed by multiple users and processes.
Assessment Criterion 8	Global data sharing is minimised to enable weak coupling, and modules exhibit functional cohesion.

Specific Outcome 4: Test programs for a computer application that accesses a database using SQL.	
Assessment Criterion 1	The testing checks all program logic paths.
Assessment Criterion 2	The testing corrects program code to eliminate errors identified through testing.
Assessment Criterion 3	The testing verifies that the database access functions in the required environment.
Assessment Criterion 4	The testing verifies that the database access performs according to the design requirements.
Assessment Criterion 5	The testing verifies that the database access functions according to the design requirements.

Specific Outcome 5: Document programs for a computer application that accesses a database using SQL	
Assessment Criterion 1	The documentation enhances the understanding of the program code.
Assessment Criterion 2	The documentation complements the self-documenting attributes of the program code.

Essential Embedded Knowledge

- Performance of all elements is to be carried out in accordance with organisation standards and procedures, unless otherwise stated. Organisation standards and procedures may cover: quality assurance, documentation, security, communication, health and safety, and personal behaviour. An example of the standards expected is the standards found in ISO 9000 Certified Organisations.
- Performance of all elements complies with the laws of South Africa, especially with regard to copyright, privacy, health and safety, and consumer rights.
- All activities must comply with any policies, procedures and requirements of the organisations involved, the ethical codes of relevant professional bodies and any relevant legislative and/ or regulatory requirements.
- Performance of all elements should be performed with a solid understanding of the use of development tools needed in the areas applicable to the unit standard. Examples of such tools are, but are not limited to CASE tools, programming language editors with syntax checking, program source version control systems.
- Performance of all elements should make use of International capability models used for Software Development. Examples of such models include (but are not limited to) the ISO SPICE model as well as the CMM model for Software Development."

Critical Cross-field Outcomes

Working
Work effectively with others as a member of an organisation.

Organising
Organise and manage him/her self and his/her activities responsibly and effectively.

Collecting
Collect, analyse, organise, and critically evaluate information.

Science
Use science and technology effectively and critically, showing responsibility towards the environment and health of others.

Demonstrating
Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exists in isolation.

Contributing
Contribute to his/her full personal development and the social and economic development of the society at large by being aware of the importance of: reflecting on and exploring a variety of strategies to learn more effectively, exploring education and career opportunities and developing entrepreneurial opportunities.

SAQA ID
115367
Unit Standard Title
Demonstrate logical problem solving and error detection techniques
NQF Level
5
Credits
8
Registration Start Date
2018-07-01
Registration End Date
2023-06-30

Purpose
People credited with this unit standard are able to:

- Describe different approaches to problem solving
- Use logical operations in descriptions of rules and relationships in problem situations
- Simplify Boolean expressions with Boolean Algebra and Karnaugh maps
- Describe the basic concepts of error detection

The performance of all elements is to a standard that allows for further learning in this area."

Range
N/A

Specific Outcome 1: Describe different approaches to problem solving.	
Assessment Criterion 1	The description identifies the different problem solving techniques.
Assessment Criterion 2	The description identifies situations where specific problem solving techniques would be more suitable than others.
Assessment Criterion 3	The description utilises the top-down problem solving approach in real life problems known to the learner.
Assessment Criterion 4	The description allows for the practice of problem breakdown in picture drawing applications.

Specific Outcome 2: Use logical operators in descriptions of rules and relationships in a problem situation.	
Assessment Criterion 1	Usage describes the logical operators by drawing truth tables.
Assessment Criterion 2	Usage provides examples of problem situations where a specific operator can be used.
Assessment Criterion 3	Usage identifies which of the operators should be used to represent given situations.
Assessment Criterion 4	Usage combines different operators to form Boolean expressions by setting up truth tables.
Specific Outcome 3: Simplify Boolean expressions with Boolean algebra and Karnaugh maps.	
Assessment Criterion 1	The simplification describes the rules of Boolean algebra.
Assessment Criterion 2	The simplification uses the Boolean algebra rules to simplify given expressions.
Assessment Criterion 3	The simplification uses Karnaugh maps to represent Boolean expressions.
Assessment Criterion 4	The simplification involves writing down the simplified expression from the map.
Specific Outcome 4: Describe the basic concepts of error detection.	
Assessment Criterion 1	The description identifies the common causes of errors.
Assessment Criterion 2	The description identifies error isolation techniques.
Assessment Criterion 3	The description identifies various testing techniques.

Essential Embedded Knowledge

- Performance of all elements should be performed with a solid understanding of the use of development tools needed in the areas applicable to the unit standard. Examples of such tools are, but are not limited to CASE tools, programming language editors with syntax checking, program source version control systems.
- Performance of all elements should make use of International capability models used for Software Development. Examples of such models include (but are not limited to) the ISO SPICE model as well as the CMM model for Software Development.

Critical Cross-field Outcomes

Identifying

Identify, solve problems and make decisions in relation to the current systems development environments

Organising

Organise and manage him/her self and his/her activities responsibly and effectively

Communicating

Communicate effectively using visual, mathematical and or language skills in the modes of oral and/ or written persuasion when engaging with systems development

Demonstrating

Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exists in isolation

Contributing

Contribute to his/her full personal development and the social and economic development of the society at large by being aware of the importance of: reflecting on and exploring a variety of strategies to learn more effectively, exploring education and career opportunities and developing entrepreneurial opportunities

Pre-Assessment Preparation Sheet

This document serves to orientate and prepare you in the assessment(s) that you are about to embark in. It is a map that informs you of the steps involved in the assessment process and will allow you to prepare for your assessment(s), helping to set you at ease, and give you the best opportunity for success.

This document MUST be completed by the Learner in the presence of the Assessor / Facilitator conducting the Pre-Assessment Process:

Programme: Databases

Unit Standard: SAQA ID 114049
Demonstrate an understanding of Computer Database Management Systems
NQF Level 5, 7 Credits
SAQA ID 115373
Demonstrate an understanding of sort and search techniques used in computer programming
NQF Level 5, 6 Credits
SAQA ID 114048
Create database access for a computer application using structured query language
NQF Level 5, 9 Credits
SAQA ID 115367
Demonstrate logical problem solving and error detection techniques
NQF Level 5, 8 Credits

Venue of Pre-Assessment Meeting: _____

Date: _____

Learner Full Name: _____

Learner ID: _____

Facilitator Full Name: _____

Assessor Full Name: _____

Assessor Number: _____

Moderator Full Name: _____

Moderator Number: _____

Please read the discussion points below. Tick yes, indicating that you have read and understand the information provided. Please contact your facilitator or assessor if you do not understand or need additional information on any of the points below:

Please take note of the following discussion points:	I have read and understand the information provided	
	YES	NO
1. Were you welcomed and made to feel at ease?		
2. Was the purpose and objectives of the meeting explained?		
3. Was the assessment process and principles of good assessment explained?		
4. The purpose of the assessment is to determine and recognise competence against unit standards as part of a qualification		

Please take note of the following discussion points:	I have read and understand the information provided	
	YES	NO
5. All roles and their responsibilities are clear and understood • Learner: To complete and submit all required evidence by the submission date • Assessor: To assess evidence submitted and provide feedback to the learner • Moderator: To quality assure the assessment process Assessment results are subject to change pending moderation		
6. Were you informed of your rights to appeal, the process and reassessment policies?		
7. Was an opportunity created to communicate any special needs that may affect the assessment?		
8. Are you familiar with the contents of the PoE and what is expected in all components?		
9. Are you aware that evidence has to be VALID, AUTHENTIC, RELIABLE, CURRENT and SUFFICIENT?		
10. Are you aware that you have to complete all sections, components, activities and administration (inclusive of signatures) in this PoE?		
11. Assessment judgements will be made against the specific outcomes and their assessment criteria of the unit standards in this module/cluster/programme?		
12. The submission due date for this portfolio is: _____ • No late submissions will be accepted. Extension requests has to be submitted 5 (five) working days prior to the agreed date • The Skills Development Provider (SDP) reserves the right to charge an administration fee to process extension requests • Copy to be made of the PoE before submission and retain for safekeeping, and accept the consequences if the original PoE is destroyed as a result of circumstances beyond the control of the SDP		
13. The assessor will provide feedback within appropriate timeframes via email. Feedback is confidential and the assessor can be contacted to clarify feedback		
14. If the assessor identifies evidence requirements that were not met, the following apply: • One opportunity for re-assessment is included in the assessment price • Should the assessment result remain unchanged upon remedial submission, and appropriate action plan will be discussed • Once areas of remediation have been addressed, application can be made for re-assessment, bearing the associated assessment costs		
15. All learner records are confidential, however, funders/sponsors of training will have access to assessment results, when so required and all assessment results are communicated to the relevant ETQA as well as such results will be uploaded to the National Learner Record Database (NLRD)		

Declaration of understanding and readiness

1. I understand the importance of this meeting
2. I declare that the above mentioned points of the pre-assessment document were explained by the Facilitator/Assessor
3. I declare that I have received copies of the qualification/unit standards, assessment plan/schedule and are aware of relevant policies and procedures pertaining to assessment
4. I was given the opportunity to clarify any issues relating to the assessment process
5. I have requested this assessment in accordance with my own free will and without redress, and that I am ready for the assessment and am satisfied that it will be conducted in a fair and valid manner

Learner Signature: _____

Date: _____

Facilitator/Assessor Signature: _____

Date: _____

Assessment Plan

Use the assessment plan to write down the dates on which you plan to meet specific targets.

This document MUST be completed by the learner in the presence of the Assessor / Facilitator conducting the Pre-Assessment Process:

Programme: Databases

Unit Standard: SAQA ID 114049
Demonstrate an understanding of Computer Database Management Systems
NQF Level 5, 7 Credits
SAQA ID 115373
Demonstrate an understanding of sort and search techniques used in computer programming
NQF Level 5, 6 Credits
SAQA ID 114048
Create database access for a computer application using structured query language
NQF Level 5, 9 Credits
SAQA ID 115367
Demonstrate logical problem solving and error detection techniques
NQF Level 5, 8 Credits

Learner Full Name: _____

Learner ID Number: _____

Facilitator Name: _____

Assessor Name: _____

Assessor ID: _____

Action	Planned Date	Actual Date	Comments
1. Read and Sign Assessment Preparation Sheet			
2. Complete the formative assessments – class activities			
3. Complete the summative assessment activities in the Learner Portfolio of Evidence Guide:			
a. Knowledge Questionnaire			
b. Practical Activities			
c. Witness Testimony			
d. Logbook			
4. Complete the Assessment Activities Checklist in the Learner Portfolio of Evidence Guide			
5. Submit the PoE			

Learner Signature: _____ **Date:** _____

Facilitator Signature: _____ **Date:** _____

Assessor Signature: _____ **Date:** _____

Moderator Signature: _____ **Date:** _____

I, the learner, hereby agree to the above plan and to commit to preparing for the assessment and submitting the specified documents (in my Portfolio of Evidence) on the dates

Declaration of Authenticity

I _____(*full name)*, ID number _____ declare that the evidence (the work and natural occurring) presented in this portfolio was completed by me and is my own, against the Unit Standards in this Programme:

Programme: _____

with the exception of:

(detail any work that was not completed by yourself, i.e. group work, etc.)

_____

_____

_____

Where assistance or advice was received, or where I used resource material form a Learner Guide, workbook, policy wording, internet or any other printed sources, this is acknowledged and referenced below: (*please list references here*):

_____

_____

_____

_____

_____

I further declare that I understand that plagiarism is a punishable offence as it constitutes the theft of another's intellectual property rights.
In signing this, I declare that all the evidence presented in this Portfolio of Evidence is true, valid and my own work:

Learner signature:_____

Date:_____

Witness Name:_____

Witness Contact Details:_____

Witness Signature:_____

Assessor Signature:_____

Date:_____

Moderator Signature:_____

Date:_____

Appeals Procedure

Familiarise yourself with the appeals procedure and sign the document as requested. You will only use the Appeals Form if you would like to appeal against the assessment decision.

The Training Provider acknowledges a Learner's right to appeal against or dispute any assessment decision.

You can appeal under the following circumstances:

- I do not agree with my assessment decision – I feel I have provided sufficient evidence
- I was not briefed properly of the nature and requirements of assessment
- I was unfairly discriminated against
- My special needs for this assessment were not accommodated

If you would like to appeal, please follow the procedure below:

Stage 1:

- Approach the workshop organiser to state your case for re-assessment within 14 working days of being informed of the assessment decision. Complete and submit the appeals form within the 14 days.
- The Training Provider will respond to all appeals and disputes received within 14 working days.
- The workshop organiser will consider the appeal and forward to the assessor if required.
- The assessor will respond with either:
    - A clear explanation stating why the assessment decision is upheld combined with a re-evaluation of the evidence.
    - An amendment of the Learner's Assessment Record should this be appropriate.

Stage 2:

- Should the decision made by the assessor be unsatisfactory, the appeal will be forwarded to the moderator for mediation and possible re-assessment.

Stage 3:

- The Training Provider management would be approached as the next step, should the decision not be accepted. A panel will be selected to administer the appeal.
- The Learner is invited to attend the proceedings held by the panel.

Stage 4:

- Once all internal appeals and dispute systems have been exhausted, appeals and disputes can be referred to the relevant ETQA for investigation.

Declaration: I hereby confirm that the above procedures have been explained to me and I accept them.

Learner Name:_____

Signature:_____

Date:_____

Appeals Form

CONDITION/S UNDER WHICH I AM SELECTING TO MAKE THIS APPEAL (select one)

I do not agree with my assessment decision – I feel I have provided sufficient evidence	
I was not briefed properly of the nature and requirements of assessment	
I was unfairly discriminated against	
My special needs for this assessment were not accommodated	

I _____ hereby appeal against the assessment decision:
(name & surname)

Training Provider:_____

Skills Programme:_____

Unit Standard(s):_____

Assessor:_____

Assessment Date:_____

Reason for appeal:_____

Learner Signature:_____

Date of Appeal:_____

Stage 1: Assessor Response

Decision Amended		Decision Upheld	
Assessor's rationale for decision			
Assessor Signature		Date of Response	

YES	NO

The above decision has been explained to me and I accept the decision

Learner Signature:_____

Date:_____

Stage 2: Moderator Response

Decision Amended		Decision Upheld	
Moderator's rationale for decision			
Moderator Name			
Moderator Signature		Date of Response	

YES	NO

The above decision has been explained to me and I accept the decision

Learner Signature:_____

Date:_____

Stage 3: Management Response

Decision Amended		Decision Upheld	
Rationale for decision			
Panel		Date of Response	
Name		Signature	
Name		Signature	
Name		Signature	
YES	**NO**		

The above decision has been explained to me and I accept the decision

Learner Signature:_____

Date:_____

Stage 4: ETQA

YES	**NO**

the appeal has been referred for investigation

Formative Assessment

Record of Implementation

"*Formative Assessment refers to assessment that takes place during the process of learning and teaching*"
(SAQA: Criteria and Guidelines for Assessment Policy Document, pg. 26)

During and after the initial training the learner will be required to complete a number of class activities. These activities will be both individual and group activities (class activities - formative).

The activities are numbered and are to be reported on to validate implementation, in the learner's portfolio of evidence. These activities will measure the progress of the learner through the programme.

This record is indicative that formative assessment did occur and was completed successfully, thus providing evidence that the learner is ready for summative assessment.

Programme:_____

Learner Name & Surname:_____

Learner ID no:_____

Formative Assessment Activity	Unit Standards Addressed (Inclusive of Specific Outcomes and Assessment Criteria aligned)	CCFO Addressed
1. Create a text file called databases.txt where you will answer the following questions. 1 Explain the difference between data and information. 2 Define each of the following terms in your own words: a. Data b. Field c. Record d. File 3 DBMS's provide a solution to a variety of issues in storing and managing data. Outline these issues, indicating how they are addressed by DBMS's. 4 What are the commonly implemented features of commercial DBMS's? 5 Research "sparse data". What is it and when might it be found? 6 Explain the different types of DBMS's. 7 Research and list three NoSQL DBMS's, reviewing their features. 8 Look up ACID properties of databases. Describe these in your own words. 9 Given the file below, answer the following questions: 1.9.1 How many records does the file contain? 1.9.2 How many fields are there per record? Remember to refer to the self-assessment table provided on the next page to assess your own degree of achievement of each of the learning outcomes. Try to gauge your own learning and address any weak areas before submitting your task, which will become part of your formative assessment portfolio.	114049	Identifying, Working, Organising, Collecting, Communicating, Science, Demonstrating, Contributing.

2. Create a Java file called ArrayLists.java 2.1 Design a class called Album. The class should contain: ● The data fields albumName (String), numberOfSongs (int) and albumArtist (String). ● A constructor that constructs a Album object with the specified albumName, numberOfSongs, and albumArtist. ● The relevant get and set methods for the data fields. ● A toString() method that returns a string that represents an Album object in the following format: o (albumName, albumArtist, numberOfSongs) 2.2 Create a new ArrayList called albums1, add 5 albums to it and print it out (You may want to look back to the Java Collections Framework task for guidance). 2.3 Sort the list according to the numberOfSongs and print it out. 2.4 Swap the element at position 1 of albums1 with the element at position 2 and print it out. 2.5 Create a new ArrayList called albums2. 2.6 Using the addAll method add 5 albums to the albums2 List and print it out. 2.7 Copy all of the albums from albums1 into albums2. 2.8 Add the following two elements to albums2: ● (Dark Side of the Moon, Pink Floyd, 9) ● (Oops!... I Did It Again, Britney Spears, 16) 2.9 Sort the courses in albums2 alphabetically according to the album name and print it out. 2.10 Search for the album “Dark Side of the Moon” in albums2 and print out the index of the album in the List.	115373	Identifying, Working, Organising, Collecting, Communicating, Science, Demonstrating, Contributing.
3. Using the following ArrayList: [“blue”, “six”, “hello”, “game”, “unorthodox”, “referee”, “ask”, “zebra”, “run”, “flex”] 3.1 Create a Java file called BubbleSort.java 3.2 Implement the Bubble sort algorithm on the ArrayList and print out the sorted list	115373	
4. Using the following array: [27, -3, 4, 5, 35, 2, 1, -40, 7, 18, 9, -1, 16, 100] 4.1 Create a Java file called Sort&Search.java 4.2 Which searching algorithm would be appropriate to use on the given list? 4.3 Implement this searching algorithm to search for the number 9. Add a comment to explain why you think this algorithm was a good choice. 4.4 Research and implement the Insertion sort on this array. 4.5 Implement the searching algorithm you haven’t tried yet in this Task on the sorted array to find the number 9. Add a comment to explain where you would use this algorithm in the real world.	115373	

5. Answer the following questions: 5.1 Define a database and the three database language types covered in this lesson (8) 5.2 Using the INVOICE table given below, draw its dependency diagram and identify all dependencies (including transitive and partial dependencies). You can assume that the table does not contain any repeating groups and that an invoice number references more than one product. o Hint: This table uses a composite primary key 5.3 Draw new dependency diagrams to show the data in 2NF. 5.4 Draw new dependency diagrams to show the data in 3NF. 5.5 Use this table to illustrate one of each kind of anomaly described in the task. In a text file called anomalies.txt, how you would change the table and which anomaly that change would create.	114048	Identifying, Working, Organising, Collecting, Communicating, Science, Demonstrating, Contributing.
6. Answer the following questions: 6.1 Go to the w3schools website's SQL browser IDE. This is where you can write and test your SQL code using their databases. Once you are happy with it, paste your code in a text file named Student.txt and save it in your task folder. 6.2 Write the SQL code to create a table called Student. The table structure is summarised in the table below (Note that STU_NUM is the primary key): 6.3 After you have created the table in question 1, write the SQL code to enter the first two rows of the table as below: 6.4 Assuming all the data in the Employee table has been entered as shown below, write the SQL code that will list all attributes for a COURSE_CODE of 305. 6.5 Write the SQL code to change the course code to 304 for the person whose student number is 07. 6.6 Write the SQL code to delete the row of the person named Jamie Lannister, who started on 5 September 2012, whose course code is 101 and project number is 2. Use logical operators to include all of the information given in this problem. 6.7 Write the SQL code that will change the PROJ_NUM to 14 for all those students who started before 1 January 2016 and whose course code is at least 201. 6.8 Write the SQL code that will delete all of the data inside a table, but not the table itself. 6.9 Write the SQL code that will delete the Student table entirely	114048	

7. Follow these steps: 7.1 Ensure that your environment is set up and you have followed all the steps outlined in this task. 7.2 Using the MySQL client: 7.2.1 Insert the following 3 new rows into the java_programming table 7.2.2 Select all records with a grade between 60 and 80. 7.2.3 Change Carl Davis's grade to 65. 7.2.4 Delete Dennis Fredrickson's row. 7.2.5 Change the grade of all people with an id greater than 55 to 80. 7.3 After executing each instruction given above, take a screenshot of your console and send it to your mentor. Number your screenshots 1 to 5 in order of execution. 7.4 Modify the Java program UpdateTest.java to set the qty for Introduction to Java to 0. 7.5 Modify the Java program as follows: InsertTest.java to delete all books with id > 8000; and insert: (8001, 'Java ABC', 'Kevin Jones', 3) and (8002, 'Java XYZ', 'Kevin Jones', 5); 7.6 Test and debug your code. 7.7 Include comments to explain complex sections of code and provide a rationale for the coding method used.	114048	
8. Follow these steps: 8.1 Create a program that can be used by a bookstore clerk. Use the comment functionality to document what you have done making the code easily understandable to anyone reading your program. The program should allow the clerk to: 8.1.1 enter new books into the database 8.1.2 update book information 8.1.3 delete books from the database 8.1.1 search the database to find a specific book. 8.2 Create a database called ebookstore and a table called books. The table should have the following structure (note that the id field is the primary key) 8.3 Populate the table with the above values. You can also add your own values if you wish. 8.4 The program should present the user with the following menu: ● Enter book ● Update book ● Delete book ● Search books ● Exit 8.5 The program should perform the function that the user selects. The implementation of these functions is left up to you. 8.6 Include comments to explain complex sections of code and provide a rationale for the coding method used. 8.7 Test and debug your code. 8.8 Feel free to add more functionality and complexity to the program. This is your chance to show off all the programming concepts you have learnt so far!	114048	Identifying, Working, Organising, Collecting, Communicating, Science, Demonstrating, Contributing.
9. Describe two different approaches to problem solving. 9.1 Answer the following and say what the theorem that governs this relationship is called. ● NOT(A OR B)= ● NOT (A AND B) = 9.2 The theorem is: 9.2.1 Identify each of these logic gates by name, and complete their respective truth tables	115367	

Facilitator Comments

We, the undersigned, declare that the formative assessment activities listed above were undertaken and completed during the instructional learning and development phase.

Signature of learner:_____

Date:_____

Signature of Facilitator:_____

Date:_____

Summative Assessment

"*Summative Assessment is assessment for making a judgement about achievement. This is carried out when a learner is ready to be assessed at the end of a programme of learning*"
(SAQA: Criteria and Guidelines for Assessment Policy Document, pg. 26)

Please complete the following summative assessment activities and submit as part of your Portfolio of Evidence:

1. Practical Activities
2. Reflexive Assessment
3. Witness Testimony
4. Logbook

The learner needs to individually complete the summative assessment activities. The summative assessment is conducted by means of a knowledge questionnaire and various integrated assessment activities. The learner needs to follow the summative assessment activity instructions to create the evidence required for the portfolio of evidence.

Knowledge Questions

No	Question	Alignment	
		US	SO
1	a. What is data management? (2) b. What are three data management issues (5)		1
2	Describe 3 commonly implemented features of DBMSs and say how they contribute to solving data management issues. (6)		2
3	a. What is a Relational Database Management System? (3) b. What is a Hierarchical Database Management System? (3)	114049	3
4	a. Name two common/popular SQL database software program? b. Name two common/popular No-SQL database software program?		4
5	a. What is an abstract data type? (6) b. Gives 3 examples of abstract data types. (3)		1
6	a. What are two sorting techniques? (2) b. Explain the working of one sorting technique. (4)	115373	2
7	a. What are two searching techniques? (2) b. Explain the working of one searching technique. (4)		3
8	a. What is Abstraction? (4) b. What is a data manipulation language (DML)? (4)		1
9	a. What is an index in a database context? (2) b. Why do we perform normalisation in a relational database? (3)	114048	2
10	Name 2 kinds of debugging.		4
11	What role should an introductory manual play in teaching users about a system? (3)		5
12	Distinguish between the bottom-up approach and the top-down approach to problem solving. (2+2=4)		1
13	Draw these logic gates: AND, OR, NOT, NAND, NOR, EXOR and EXNOR gates. (7*2=14)	115367	2
14	a. What are Truth Tables? (2) b. Complete the following statements: In Boolean algebra: (2)		3
15	a. Give 3 common causes of errors in programming. (3) b. What is black box testing? (4)		4

THE TASK AT HAND

You have been asked to create a project management system for a small structural engineering firm called “Poised”. Poised does the engineering needed to ensure the structural integrity of various buildings. They want you to create a Java program that they can use to keep track of the many projects on which they work.

Poised stores the following information for each project that they work on:

- Project number.
- Project name.
- What type of building is being designed? E.g. House, apartment block or store, etc.
- The physical address for the project.
- ERF number.
- The total fee being charged for the project.
- The total amount paid to date.
- Deadline for the project.
- The name, telephone number, email address and physical address of the architect for the project.
- The name, telephone number, email address and physical address of the contractor for the project.
- The name, telephone number, email address and physical address of the customer for the project.

Poised wants to be able to use your program to do the following:

- Capture information about new projects. If a project name is not provided when the information is captured, name the project using the surname of the customer. For example, a house being built by Mike Tyson would be called “House Tyson” and an apartment block owned by Jared Goldman would be called “Apartment Goldman”.
- Update information about existing projects. Information may need to be adjusted at different stages throughout the lifecycle of a project. For example, the deadline might change after a meeting with various stakeholders.
- Finalise existing projects. When a project is finalised, the following should happen:
    - The project should be marked as “finalised” in some way and the completion date should be added.
- See a list of projects that still need to be completed (have not been finalised).
- See a list of projects that are past the due date.
- Find and select a project by entering either the project number or project name.

Before you begin

A key focus of this project will be ensuring that your code is correct, well-formatted and readable. In this regard, make sure that you do the following before submitting your work:

1. Make sure that your code is readable. To ensure this, add comments to your code, use descriptive variable names and make good use of whitespace and indentation. See **this style guide** to see how classes and methods should be named and how your program should be formatted.

2. Make sure that your code is as efficient as possible. How you choose to write code to create the solution to the specified problem is up to you. However, make sure that you write your code as efficiently as possible.

3. Make sure that all output that your program provides to the user is easy to read and understand. Labelling all data that you output (whether in text files or to the screen) is essential to make the data your program produces more user-friendly.

Practical Activities

Individually complete **all** the following practical and workplace-related activities to show your ability to integrate and apply your knowledge and skills in the workplace.

Please type and insert your evidence hereafter, clearly marked and activity identifiers clearly visible for assessment. **Please sign, in original, all your evidence after printing it out and inserting after all the completed activities**

Activity No	Activity	Alignment	
		US	SO
1	Follow these steps: 1.1 Design and create a MySQL database called PoisePMS. Assume that each project can only be assigned to one Structural Engineer. Each project will also only have one Project Manager, one Architect and one customer. Submit the following: • An ERD that shows the relationships between the tables in your database. • Screenshots of your console that show how each table was created. Add at least two rows of data to each table in the database. Submit screenshots of your console that show how data is added to the tables.		
2	2.1 Follow these steps: 2.1.1 Using the JDBC, write a java program with the functionality to: ● Read and write data about projects and people associated with projects from your database. Your program should not use any text files. ● Capture information about new projects and add these to the database. ● Update information about existing projects. ● Delete data about projects and people associated with them. ● Finalise existing projects - when finalised the project should be marked as "finalised" and the completion date should be added. ● Find all projects that still need to be completed from the database. ● Find all projects that are past the due date from the database. ● Find and select a project by entering either the project number or project name. 2.1.2 Besides meeting the above criteria, you should also do the following: ● Remove all errors from your code. Take extra care to detect and remove all logical and runtime errors. ● Document your code. Adhere to the style guide found here. ● Use Javadoc to generate API documentation from documentation comments for your program. ● Follow the guidelines here to create a Readme file for this project.		

Reflexive Assessment

Please answer **all** the following reflexive questions related to the module and its unit standards and place it in your portfolio of evidence. Remember to number the answers according to the question numbers, should you need to attach a document.

You have to complete this reflexive assessment individually **based** on the development throughout this module in the theoretical and practical aspects completed during the instructional learning and development phase.

Please insert your typed answers hereafter, clearly identifying and marking the question number. **Please sign, in original, all your evidence after printing it out and inserting after all the completed questions**.

Question No	Question
1	What new skills did you learn in this module / programme?
2	How do you plan to implement these new skills in your workplace?
3	What aspects of this module / programme did you find difficult to grasp?
4	How did you overcome those aspects mentioned in question number 3?
5	Conduct a SWOT analysis for this module / programme

Witness Testimony

In the workplace, you need to show your ability to integrate what you have learnt. This can be measured with the Specific Outcomes and the Critical Cross Field Outcomes of the module and the unit standards in the module.

Request your supervisor (or workplace mentor) to complete the following form to show that you are able to integrate your learning into everyday workplace application. It is necessary that the supervisor also provides a short comment on the form:

Learner Name & Surname:_____

Date:_____

Did the Learner:	Yes	No
1. Describe data management issues and how it is addressed by a DBMS.		
2. Describe commonly implemented features of commercial database management systems		
3. Describe different type of DBMS`s.		
4. Review DBMS end-user tools.		
5. Demonstrate an understanding of how abstract data types are stored on computers.		
6. Demonstrate an understanding of sort techniques used to sort data held in data structures.		
7. Demonstrate an understanding of search techniques.		
8. Review the requirements for database access for a computer application using SQL		
9. Design database access for a computer application using SQL.		
10. Write program code for database access for a computer application using SQL.		
11. Test programs for a computer application that accesses a database using SQL.		
12. Document programs for a computer application that accesses a database using SQL		
13. Describe different approaches to problem solving.		

Did the Learner:	Yes	No
14. Use logical operators in descriptions of rules and relationships		
15. Simplify Boolean expressions with Boolean algebra and Karnaugh maps.		
16. Describe the basic concepts of error detection.		

Comments about how the learner applied the knowledge and skills in this programme:

Supervisor/Manager Name & Surname:_____

Supervisor/Manager:_____

Supervisor/Manager Designation/Position:_____

Supervisor/Manager Contact Details:T: _____

E: _____

C: _____

Learner Signature:_____

Date:_____

Assessor Signature:_____

Date:_____

Moderator Signature:_____

Logbook

Complete this individually in your workplace. This logbook has been included to record all the time spent on learning and preparation for the assessment and other activities related to this programme:

- Time spent in class (training)
- Time spent completing a task / activity should be signed off by a supervisor, mentor or witness where possible.
- Time spent applying the new knowledge and skills
- The logbook should show that the learner has spent at least 300 hours in acquiring the required knowledge and skills of this programme, including tasks related to the following:
    - Demonstrate an understanding of Computer Database Management Systems.
    - Demonstrate an understanding of sort and search techniques used in computer programming.
    - Create database access for a computer application using structured query language.
    - Demonstrate an understanding of search techniques.

US: 114049 Demonstrate an understanding of Computer Database Management Systems			
Specific Outcome	**Date Completed**	**Facilitator/Coach/Mentor/Manager signature**	**Learner Signature**
Instructional Learning and Development			
01: Describe data management issues and how it is addressed by a DBMS.			
02: Describe commonly implemented features of commercial database management systems			
03: Describe different type of DBMS`s.			
04: Review DBMS end-user tools			

US: 115373 Demonstrate an understanding of sort and search techniques used in computer programming			
Specific Outcome	**Date Completed**	**Facilitator/Coach/Mentor/Manager signature**	**Learner Signature**
Instructional Learning and Development			
01: Demonstrate an understanding of how abstract data types are stored on computers.			
02: Demonstrate an understanding of sort techniques used to sort data held in data structures.			
03: Demonstrate an understanding of search techniques			

US: 114048 Create database access for a computer application using structured query language			
Specific Outcome	**Date Completed**	**Facilitator/Coach/Mentor/Manager signature**	**Learner Signature**
Instructional Learning and Development			
01: Review the requirements for database access for a computer application using SQL			
02: Design database access for a computer application using SQL.			
03: Write program code for database access for a computer application using SQL.			
04: Test programs for a computer application that accesses a database using SQL.			
05: Document programs for a computer application that accesses a database using SQL			

US: 115367 Demonstrate an understanding of search techniques.			
Specific Outcome	**Date Completed**	**Facilitator/Coach/Mentor/Manager signature**	**Learner Signature**
Instructional Learning and Development			
01: Describe different approaches to problem solving.			
02: Use logical operators in descriptions of rules and relationships in a problem situation.			
03: Simplify Boolean expressions with Boolean algebra and Karnaugh maps.			
04: Describe the basic concepts of error detection.			

Assessor Signature:_____

Date:_____

Moderator Signature:_____

Date:_____

Glossary

Assessment	A structured process for gathering evidence and making judgments about an individual's performance in relation to registered, national standards
Assessment Guide	The document sets out what will be assessed, and what evidence needs to be generated
Assessment Plan	Document used to plan the assessment process.
Assessment Process	Incorporates all activities that form part of the assessment.
Coaching	A training method in which an experienced individual guides the learner towards acquiring specific skills.
Competent	Learners are declared competent when they meet the outcomes of the unit standard.
ETQA	The Education Training Quality Assurance Body is responsible for ensuring quality training and development within a specific sector.
Formative Assessment	Refers to the assessment that takes place during the process of learning. The assessment provides an indication of how the learning is progressing. Additional training needs may be identified during the process.
Learnership	A Learnership is a work-based approach to learning and gaining qualifications and includes both structured work experience (practical) and structured learning (theory).
Mentor	A multi-skilled individual who serves as a sponsor, teacher, coach, sounding board and counsellor.
Moderation	A process of review that confirms that processes that have been followed are valid, consistent, fair and adequate.
NQF	The National Qualifications Framework provides a framework for nationally recognised qualifications. Qualifications are assessed according to ten bands.
NYC	Not Yet Competent
OBET	Outcomes Based Education and Training
QMS	Quality Management System
Qualifications	A group of unit standards that have been clustered together to make up a registered qualification. There are 3 types of qualifications on the NQF: certificates (120cr), diplomas (240cr) and degree (360cr).
RPL	A process whereby learners are assessed and given credit for learning that has already taken place within the workplace.
SAQA	South African Qualifications Authority
SDA	Skills Development Act
SDF	Skills Development Facilitator
SETA	Sector Education and Training Authority
SGB	Standards Generating Bodies
Skills Programmes	Occupationally based learning intervention that uses providers to train learners towards the achievement of national unit standards.
SME	Subject Matter Expert
Summative Assessment	Occurs at the end of the learning process. Evidence is gathered and an assessment is made as to whether a learner has met requirements for competence.
Training Providers	Organisations or individuals that provide learning. These include technical colleges, Technikons, distance education institutions, universities, private providers or company in-house training divisions.
Unit Standards	A collection of knowledge, skills and attributes in which a candidate must prove competence (in a structured assessment) to gain credit on the NQF.

VACCS	An assessment tool, which asks whether evidence is valid, authentic, current, consistent and sufficient.