Systems and Principles Unit Syllabus

Level 3 Creating an event driven computer program using Visual Basic.NET

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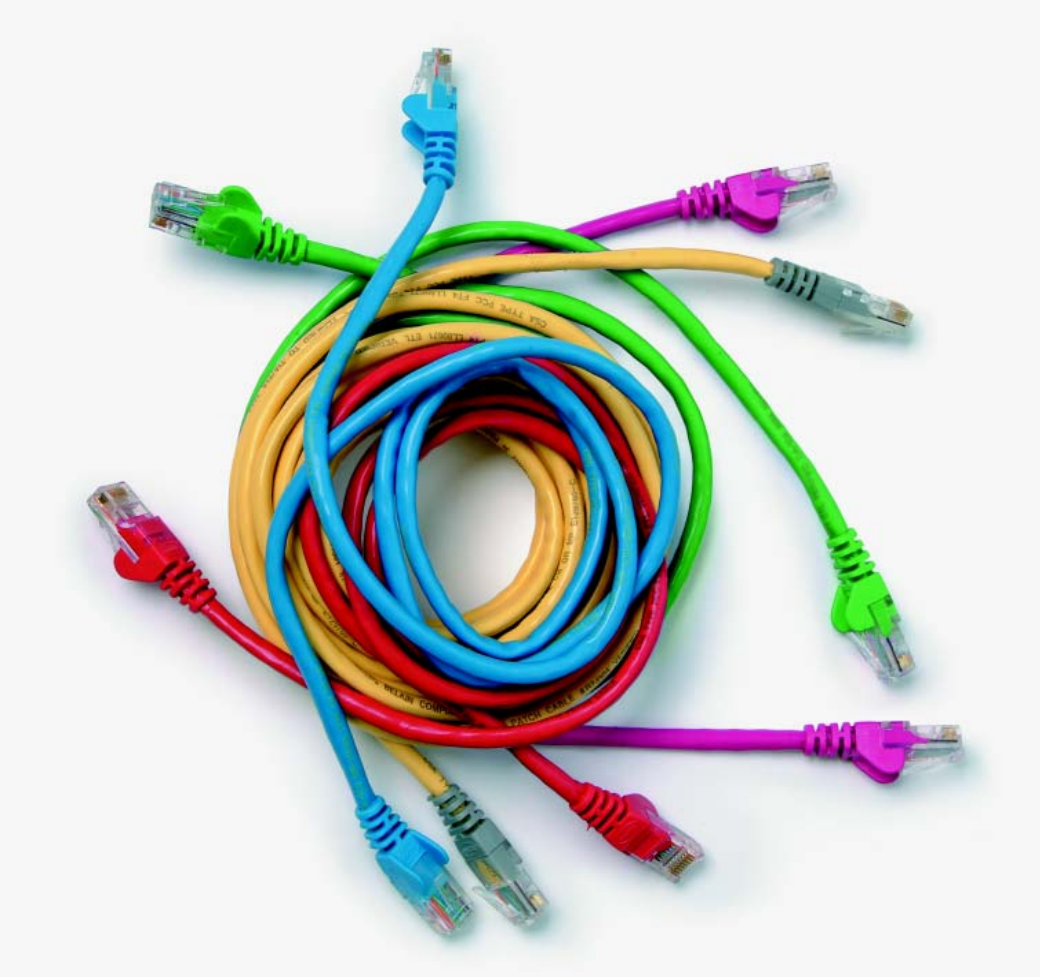

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Unit 038 Creating an event driven computer program using Visual Basic.NET

Syllabus Overview

Unit accreditation number F/601/3179

Credit value 12

Rationale

This unit covers more advanced concepts of event driven computer languages and their use to implement, refine and test computer programs.

Learning outcomes

There are **four** outcomes to this unit. The candidate will be able to:

1 Implement a software design using event driven programming
2 Refine an event driven program to improve quality
3 Test the operation of an event driven program
4 Document an event driven program

Guided learning hours

It is recommended that **90** guided learning hours should be allocated for this unit. This may be on a full time or part time basis.

Connections with other qualifications

This unit contributes towards the learning outcomes and assessment criteria required for the level 3 Diploma in ICT Professional Competence.

Assessment and grading

Assessment will be by means of a **set assignment** covering practical activities and underpinning knowledge.

Unit 038 Creating an event driven computer program using Visual Basic.NET

Outcome 1 Implement a software design using event driven programming

Practical activities

The learner will be able to

1 identify the screen components and data and file structures required to implement a given design
2 select, declare and initialise variable and data structure types and sizes to implement design requirements
3 select and assign properties to screen components to implement design requirements
4 select and associate events (including parameter passing) to screen components to implement design requirements
5 implement event handling using control structures to meet the design algorithms
6 select and declare file structures to meet design file storage requirements
7 select and use standard input/output commands to implement design requirements
8 make effective use of operators and predefined functions
9 make effective use of an Integrated Development Environment (IDE) including code and screen templates

Underpinning knowledge

The learner will be able to

- explain the purpose and action of the following controls: CheckBox, ComboBox, , ListBox, PictureBox, TextBox
- describe the purpose of a bound control
- describe the features of a record structured database
- identify appropriate data types for the fields in a given record eg text, date, logical, numeric. currency
- state that a primary key is used to uniquely identify a record
- explain how the properties of bound controls can be set to enable access to database records
- describe arrays with a data type of integer or string
- explain the use of the Structure definition to create a user defined variable with two or more elements
- describe the properties: Cancel, Checked, Count, Cursor, DatabaseName, Image, Items, SelectedIndex, SelectedItem, SizeMode, Sorted, TabIndex, TabStop
- explain the purpose and use of the DataGrid control
- describe control structures used for selection ie If, If ... Else, Select Case
- describe control structures for loops ie For … Next, Do While … Loop, Do … Loop While
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), <> (not equal to)
- describe the logical operators AND, OR, NOT
- describe the arithmetic operators ie + (add), - (subtract), * (multiply), / (divide), MOD (modulus)
- describe the assignment operator =
- describe functions that can be used for concatenating and manipulating a string
- explain the use of the isNumeric, Val and StrComp functions
- explain how data from a database can be connected to bound controls on a form

- state the syntax and structure of basic SQL queries
- explain how an SQL query can be embedded in the code
- describe the objects, properties methods and events that are used to output data to a printer

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Outcome 2 Refine an event driven program to improve quality

Practical activities

The learner will be able to

1 use an agreed standard for naming, comments and code layout
2 define user functions to replace repeating code sequences
3 implement data validation for inputs
4 identify and implement opportunities for error handling and reporting

Underpinning knowledge

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for forms, controls and variables
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- explain the use of Try, Catch and Finally in error trapping
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken after an error

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Outcome 3 Test the operation of an event driven program

Practical activities

The learner will be able to

1 make effective use of the debugging facilities available in the IDE
2 prepare a test strategy
3 select suitable test data and determine expected test results
4 record actual test results to enable comparison with expected results
5 analyse actual test results against expected results to identify discrepancies
6 investigate test discrepancies to identify and rectify their causes

Underpinning knowledge

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- explain the purpose of a test plan is, for each test to be performed, to identify the type of test, the test data required and the expected results of the test
- state that test data should contain valid and invalid data
- explain the purpose of a test log is to record the actual results of each test in the test plan, comment on any discrepancies between the actual results and the expected results and record if any amendments are made to correct an error
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

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Outcome 4 Document an event driven program

Practical activities

The candidate will be able to

1 create on-screen help to assist the users of a computer program

2 create documentation for the support and maintenance of a computer program

Underpinning knowledge

The learner will be able to

- describe how screen prompts or tool tips are used to provide information to a user
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing, test plan and test results

Unit record sheet

Use this form to track your progress through this unit.

Tick the boxes when you have covered each outcome. When they are all ticked, you are ready to be assessed.

Outcome	✓	Date
1 Implement a software design using event driven programming	☐	
2 Refine an event driven program to improve quality	☐	
3 Test the operation of an event driven program	☐	
4 Document an event driven program	☐	

Candidate Signature ..... **Date** .....

City & Guilds Registration Number .....

Quality nominee (if sampled) ..... **Date** .....

Assessor Signature ..... **Date** .....

External Verifier Signature (if sampled) ..... **Date** .....

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