

## **Unit 5: Programmed Solution to a Problem**

Non-exam assessment

20% of qualification

This unit requires the learners to investigate, design, prototype, implement, test and evaluate a computer solution to a substantial problem of their own choice. The learner's chosen problem must provide sufficient scope for them to access the marks available for each section of the work.

Learners need to investigate their chosen problems in sufficient detail to identify how data is collected, processed and output currently. The current system may be either paper-based or electronic.

Following the identification of their problems, learners should prepare sufficient documentation to allow them to take part effectively in the discussion with their teachers and/or peers.

Notionally this task will require 72 guided learning hours, which includes teaching time.

### **1. Discussion**

Describe, to others, the broad aims of the project specifying possible limitations to the solution of the problem.

Identify and describe, to others, the possible limitations of a solution to the problem.

Consider and use feedback from others to refine understanding of the problem and proposed solution.

### **2. Investigation**

Carry out an investigation of the current system using a variety of appropriate methods.

Research existing solutions to similar problems.

Identify stakeholders of the current system and their requirements for the proposed project.

Analyse data collected for input and processing by the current system.

Identify and describe all outputs from the current system.

Consider the limitations of the current system.

Produce a working specification that summarises the purpose of the project.

Justify the methods to be used in the solution to the problem

Set objectives, including measurable success criteria for the proposed system.

### 3. Design

Input and output	To achieve each of the stated objectives: Specify, design and document screen layouts, reports and other forms of input and output required to create the user interface.
Data structures and methods of access	Design and document all data structures that will be required to produce the output for the solution to the problem together with the method of accessing the data in that data structure.  Ensure that all data entered into the system is valid.
Processing stages	Design programming routines to be used to handle and process data within the proposed solution to achieve each objective. Document these designs using a structured convention such as pseudo-code.

### 4. Prototype

Justify the areas of the problem to be included in the prototype system.

Produce a range of screens and outputs for the prototype solution.

Create a functioning system that carries out all chosen processes.

Use realistic data for output and storage.

Evaluate the prototype solution.

Make specific suggestions for improvement.

### 5. Post-prototype refinement of design

Obtain feedback from competent third parties.

Refine designs in light of the evaluation of the prototype solution and feedback received from others.

### 6. Software development

Refine the prototype using the amended design documentation ensuring that the finished system is functional and suitable for audience and purpose. Produce annotated listings for the finished system to facilitate future maintenance.

## 7. Testing

Developmental testing	Produce evidence of testing at each stage of development.
Testing the final system	<p>Produce evidence of all problems encountered and actions taken to overcome these problems.</p> <p>Design a test plan to test:</p> <ul style="list-style-type: none"><li>• each individual system function</li><li>• that each individual function works with typical, extreme or invalid data</li><li>• the whole system to ensure that the system produces the correct results for the data input.</li></ul>
Actual test runs	Produce annotated test runs that include commentaries on the outcomes of the testing process.

## 8. Evaluation

Evaluate the system	<p>Produce an evaluation of the programming language used to create the solution.</p> <p>Compare the solution with similar commercially available systems.</p> <p>Identify the successful features of the system and make specific suggestions for improving less successful areas of the system.</p> <p>Describe the strengths and weaknesses of own performance in the design and prototyping of the solution.</p> <p>Describe changes of approach that would be adopted to solve a similar problem.</p>
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