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Cambridge **TECHNICALS LEVEL 2**

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Unit 4

Creating programming solutions for business

Model assignment

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Contents

Please note:

You can use this assignment to provide evidence for summative assessment, which is when the learner has completed their learning for this unit and is ready to be assessed against the grading criteria.

You can use this assignment as it is, or you can modify it or write your own; we give more information in this document under Guidance for tutors.

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Guidance for tutors on using this assignment

General

OCR Cambridge Technical model assignments are available to download from our website: www.ocr.org.uk.

The purpose of this assignment is to provide a scenario and model of tasks that are typical of how IT software practitioners would create programming solutions for business, to enable you to assess your learner against the requirements specified in the grading criteria. The scenario and its tasks are intended to give a work-relevant reason for applying the skills, knowledge and understanding needed to achieve the unit.

This assignment will not instruct learners how to meet the highest grade. Whether learners achieve a pass, merit or distinction will depend on what evidence they produce.

You can modify the scenario we provide in this assignment to make it more relevant to your local or regional needs. Please refer to the information under 'Modifying the model assignment' later in this section.

You don't have to use this assignment. You can use it as a guide to help you to design your own assignment, and we provide an assignment checking service. You'll find more information on these matters in section 8 of the qualification handbook.

In the tasks, we'll refer to the format of evidence. Learners are **not** required to follow that format **unless** we tell them otherwise.

It's essential that the work every learner produces is their own. Please make sure you read through the information we give on authenticity in section 8 of the qualification handbook and make sure that your learners and any staff involved in assessment understand how important authenticity is.

We provide this assignment to be used for summative assessment. You must not use it for practice or for formative assessment.

Before using this assignment to carry out assessment

Learners will need to take part in a planned learning programme that covers the knowledge, understanding and skills of the unit.

When your learners are ready to be assessed, they must be provided with a copy of the following sections of this assignment:

- General information for learners
- Assignment for learners
- Evidence Checklist

They may carry out preparation prior to undertaking the tasks and there is no time limit for this.

When completing the assignment

You should use this assignment in conjunction with the unit specification and qualification handbook.

The assignment should take between 8 and 11 hours for learners to complete, although time may be allocated, if required.

The scenario, particularly relating to the program to be produced, may be adapted. The scenario provided gives an indication of the complexity of the program expected to be produced by the learner.

The program code should be provided in electronic format, in a manner that allows the Visiting Moderator to run the program.

Information to support the scenario/tasks

The tutor may act as the client to answer any questions the learners may have when tackling the scenario.

Resources to complete the tasks

There are resource requirements for this assignment. Every learner will need access to the following resources:

For Task 1 learners will require internet access.

For Task 2 learners will again require internet access. Learners should be provided with two or three different business solutions that would require the use of different programming languages. These would allow the learners to investigate the features of the different programming languages that they have identified for each of the business solutions.

For Task 3 Office-type software is required. Flowcharts do not need to be produced in electronic format.

For Task 4 learners will need access to programming software, office-type software and the internet.

Time

You should plan for learners to have 8–11 hours to complete this assignment.

Learners must be allowed sufficient time to complete all the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. To help with your planning, against each of the tasks we've given an indication of how long it should take.

Learners can produce evidence in several sessions.

Format of evidence

Learners have to produce evidence that demonstrates how they have met the grading criteria. At the very least they must produce evidence that meets **all** of the pass criteria.

Please make sure your learners realise that missing just one pass criterion means they will not pass the unit, even if they have successfully met the merit and distinction criteria.

It's possible that certain formats for evidence can naturally cover several grading criteria and avoid the need for excessive amounts of evidence. For example, a report can be a good way to pull together evidence to meet several grading criteria.

For more guidance on generation and collection of evidence, please refer to the section 8 'Internal Assessment', in the qualification handbook.

Group work

This assignment hasn't been written to include group work.

After completing the assignment

Once the learner has submitted their work to you to be assessed, you must judge or 'mark' the work against the grading criteria for the unit and identify one grade for the unit. For further information about assessment, please refer to section 8 of the qualification handbook.

Your assessment decisions must be quality assured across the cohort of learners in your centre who are being entered for the same unit. This must be done through an internal standardisation process. We give information on internal assessment and standardisation in the qualification handbook.

Reworking the assignment

If you and the learner feel they've not performed at their best during the assessment, the learner can, at your discretion, improve their work and resubmit it to you for assessment. If a learner is working on improving their work before it is resubmitted, you and the learner must continue to make sure the work is the learner's own.

Any feedback you give to the learner must not direct them on how to improve their work. You can identify what area of the work could be improved but you cannot give the learner any details about how they could improve it. You must follow the guidelines given in section 8 of the qualification handbook under 'Authenticity of learner work'.

Modifying the model assignment

The tasks in this assignment allow learners access to the full range of grades detailed in the grading criteria of this unit.

If you modify this assignment you must **not** change the grading criteria provided in the tasks for the learner or in the evidence checklist. These grading criteria are taken from the unit.

You can modify the scenario to suit your local or regional needs and the tasks may be contextualised to match any changes you have made to the scenario. If you supply your own drawings to support a different scenario, these must be sufficiently detailed for learners to complete the tasks.

You can modify the type of evidence and the format it takes, unless we expressly state that evidence must take a specific format.

You must also make sure that you avoid discrimination, bias and stereotyping and support equality and diversity. For more information, please see the section 'Designing your own assignments for internally assessed units' in section 8 of the qualification handbook.

If modifications are made to the model assignment, whether to the scenario alone, or to both the scenario and individual tasks, it's your responsibility to make sure that all grading criteria can still be met and that learners can access the full range of grades.

If you're using this model assignment and delivering the Certificate you have an opportunity to secure meaningful employer involvement by working with an employer to modify it.

General information for learners

Q   ***What do I need to do to pass this assignment?***

A   You need to produce evidence to meet the requirements of **all** the pass criteria for the unit this assignment relates to. If you miss just one pass criterion, you will not achieve this unit and will receive an unclassified result.

Q   ***What do I need to do if I want to get a merit or distinction for this assignment?***

A   For a merit, you need to produce evidence to meet the requirements of **all** the pass criteria for the unit this assignment relates to **and** you need to produce evidence to meet **all** the merit criteria.

For a distinction, in addition to the above, you also need to meet **all** the distinction criteria for this unit.

Q   ***What help will I get?***

A   Your tutor will support you when completing this assignment and will make sure that you know what resources or facilities you need and are allowed to use. We've given your tutor information about how much support they can give you.

Q   ***What if I don't understand something?***

A   It's your responsibility to read the assignment carefully and make sure you understand what you need to do and what you should hand in. If you are not sure, check with your tutor.

Q   ***I've been told I must not plagiarise. What does this mean?***

A   Plagiarism is when you take someone else's work and pass this off as your own, or if you fail to acknowledge sources properly. This includes information taken from the internet.

It's not just about presenting a whole copied assignment as your own; you will also be plagiarising if you use the ideas or words of others without acknowledgement, and this is why it's important to reference your work correctly (see Q&A below for more information on referencing).

Plagiarism has serious consequences; you could lose the grade for this unit or you may not be allowed to achieve the whole qualification.

Always remember that the work you produce must be your own work. You will be asked to sign a declaration to say that it is.

Q   ***What is referencing and where can I find out more information about it?***

A   Referencing is the process of acknowledging the work of others. If you use someone else's words and ideas in your assignment, you must acknowledge it, and this is done through referencing.

You should think about why you want to use and reference other people's work. If you need to show your own knowledge or understanding about an aspect of subject content in your assignment, then just quoting and referencing someone else's work will not show that **you** know or understand it. Make sure it's clear in your work how you are using the material you have referenced **to inform** your thoughts, ideas or conclusions.

You can find more information about how to reference in *The OCR Guide to Referencing* available on our website: http://www.ocr.org.uk/Images/168840-the-ocr-guide-to-referencing

Q   ***Can I work in a group?***

A   This assignment hasn't been written to include group work.

Q   ***Does my work for each task need to be in a particular format?***

A   You can present your work in a variety of ways – it can be handwritten, word-processed, on video or in digital media. What you choose should be appropriate to the task(s) and your tutor can advise you about this. There may be times when you need proof that you have completed the work yourself: for example, if you do something during work placement that you want to use as evidence, the tutor might ask the employer to provide a witness statement.

Make sure you check the wording in each task carefully. For each task, we'll tell you if your evidence has to be in a specific format:

- If we use the word '**must**', for example 'You must produce a report' or 'Your evidence/work must include a diagram', then you must produce the work in the stated format.
- If we use the word '**could**', for example 'You could include sketches of your ideas' or 'You could do this by annotating your diagram', this means that you are not required to follow the format we have given, but you must make sure that the work you do produce allows you to demonstrate the requirements of the grading criteria.

If you are unsure about what evidence you need, please ask your tutor.

Q   ***Can I ask my tutor for feedback on my work?***

A   Yes, but they can't give you detailed feedback.

We have given your tutor instructions on what kind of feedback they can give you. For example, they are **not** allowed to tell you exactly what to do to make your work better, but they **can** remind you about what they've taught you and you can use this additional learning to try and improve your work independently. They can say what they've noticed might be wrong with your work, for example if your work is descriptive where an evaluation is required, but your tutor can't tell you specifically what you need to do to change it from a description to an evaluation – you will need to work out what you need to do and then do it for yourself.

Q   ***When I have finished, what do I need to do?***

A   If you have included the personal details (such as name, address or date of birth) of someone other than yourself in your work, this must be blanked out (anonymised) – your tutor will tell you how to do this. You don't need to do this for information contained in references.

You can complete the evidence checklist to show your tutor where they can find the evidence for each grading criterion in your work.

You should make sure your work is labelled, titled and in the correct order for assessing.

Hand in the work that you've completed for each task to your tutor. They might ask to see your draft work, so please keep your draft work in a safe place.

Q   ***How will my work be assessed?***

A   Your work will be marked by someone in your centre who has been authorised to do so. They will use the information in the grading criteria to decide which grade your work meets. The grading criteria are detailed in each unit and are also given in the tasks within this assignment. Please ask your tutor if you are unsure what the grading criteria are for this assignment.

Assignment for learners

Unit 4: Creating programming solutions for business

Scenario

You will explore the job role of a software practitioner as well as exploring programming languages and the contexts in which these may be used.

You will plan a business solution using a programming language, create the program using an appropriate development environment, test the program and reflect on the program created.

Progress Software House

Progress Software House is a company that provides software products for customers. The company currently employs people in a number of job roles. These include:

- Analysts;
- Architects;
- Developers;
- Testers;
- Technical support;
- Managers.

The company requires a fact sheet, information sheet or similar to explain the role of software practitioners.

The company produces solutions for clients in a variety of programming languages, depending on the requirements of the solution.

All programs are planned in advance of creating the solution for the client.

Once programs are created these are tested and evaluated to ensure that the program meets the needs of the client.

A client, Westchester Plumbing and Heating, requires a programming solution to calculate the heat output required from the radiator(s) in a room in a house. This is measured in BTUs (British Thermal Units).

The details about the room are to be entered into the program and the heat output (BTUs) required is to be calculated. This is calculated by the client as follows:

Room	Multiplication Factor
Lounges, dining rooms and bathrooms	Multiply cubic feet by 5
Bedrooms	Multiply cubic feet by 4
Hallways and kitchens	Multiply cubic feet by 3
For rooms facing North	Add 15%
For French windows	Add 20%
For double glazing	Deduct 10%

Measurements may be entered in metric (metres) or imperial measurements (feet).
(1 cubic metre = 35.3 cubic feet)

Task 1: The role of software practitioners

(This task should take between 1 and 1½ hours.)

Learning Outcome 1: Understand the roles of software practitioners

Your task is to: describe what a software practitioner does and job opportunities for a software practitioner.

Pass	Merit	Distinction
P1: Describe the role of a software practitioner		
Evidence		
A presentation with detailed speaker notes, a report or job fact sheets. This must include: • the various roles of software practitioners and the resulting employment opportunities.		

Task 2: The features of programming languages

(This task should take between 1 and 1½ hours.)

Learning Outcome 2: Be able to research the features of programming languages used for business solutions

Your task is to: investigate programming languages used for different business solutions and consider the features of the programming languages. You should consider how features in various programming languages facilitate the creation of business solutions.

Pass	Merit	Distinction
P2: Investigate the features of programming languages for different business solutions		
Evidence		

A presentation with detailed speaker notes, a report or a recording of delivering a presentation.

This must focus on features of each selected programming language (a high-level language of your choice and a low-level language of your choice) suitable for different business solutions including:

- consideration of target platform;
- intended use;
- compatibility;
- security needs;
- user needs;
- maintenance;
- support.

Task 3: Plan the program

(This task should take between 1½ and 2 hours.)

Learning Outcome 3: Be able to plan business solutions using programming languages

Your task is to: plan the program required by the client and justify why the language you have selected is appropriate for the program.

Pass	Merit	Distinction
P3: Create a plan for the program to meet the business need	M1: Justify why the selected programming language is appropriate for the planned program	
Evidence		

A plan of the program in the format of a report or a plan of the intended program using pseudo code.

This should include planning in the form of:

- a flowchart or pseudo code for the program;
- screen layouts for the program for input, output and navigation between screens;
- a data table.

A presentation with detailed speaker notes, a report or a recording of delivering an oral presentation.

This should include justification of the programming language selected to produce the program, covering:

- the target platform on which the program will be used and compatibility across platforms;
- the intended use of the program;
- how the user will interact with the program;
- program maintenance and support;
- any security issues relating to the program.

Task 4: Create the program

(This task should take between 4½ and 6 hours.)

Learning Outcome 4: Be able to create business solutions using programming languages

Your task is to: create, test and evaluate the program to meet the client needs.

Pass	Merit	Distinction
P4: Create the program from the plan	M2: Format the program code using appropriate layout	D1: Annotate the program code with appropriate comments
P5: Test the functionality of the program	M3: Implement changes to the program as a result of testing	D2: Evaluate the functionality of the program
Evidence		

The electronic file containing the program code.

This should include:

- the program code produced from the plan in Task 3;
- code produced which allows the program to function;
- indentation in the code to make the code easier to read;
- comments included in the code to make the code easier to follow;
- comments which are meaningful to allow a competent third party to amend the code at a later date.

A test plan.

The test plan will confirm that the program has been tested, to include:

- what is being tested;
- the expected outcome;
- the actual outcome;
- explanatory notes to explain why a test may have failed and the corrective action to be taken;
- testing of boundary data;
- testing of extreme and invalid data.

Evidence of updated tests. If tests did not perform as expected, then they need to be re-tested after changing the program to show that the issue(s) have been resolved or the program is fully functioning and meets the needs of the business solution.

A presentation with detailed speaker notes, a report or a recording of a professional discussion.

This should include an evaluation of:

- the test results against the expected outcomes;
- the program against the design specification.

Evidence Checklist

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Unit 4: Creating programming solutions for business

LEARNER NAME:

For Pass have you: (as a minimum you have to show you can meet every pass criterion to complete the unit)	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
P1: Described the role of a software practitioner?	
P2: Investigated the features of programming languages for different business solutions?	
P3: Created a plan for the program to meet the business need?	
P4: Created the program from the plan?	
P5: Tested the functionality of the program?	

For Merit have you:	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
M1: Justified why the selected programming language is appropriate for the planned program?	
M2: Formatted the program code using appropriate layout?	
M3: Implemented changes to the program as a result of testing?	

For Distinction have you:	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
D1: Annotated the program code with appropriate comments?	
D2: Evaluated the functionality of the program?	

To find out more
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Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**