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| **Qualification** | Pearson BTEC Level 5 Higher National Diploma in Computing (Software Engineering) | | | | |
| **Unit No. and Title** | Unit 29 – Application Program Interfaces | | | | |
| **Assessor Name** | Joe Trobisch | | | **Issue Date** | 1st June 2019 |
| **Internal Verifier** | Neal Robinson | | | **IV Date** | 29th August 2018 |
| **Assignment Title** | Cromwell’s Indoor Plaza | | | | |
| **Submission Deadline** | 9pm Wednesday 19th June 2019 | | | | |
| **Learning Aims/Outcomes** | | | **Vocational Scenario (Context/Background)** | | |
| **LO1** Examine what an API is, the need for APIs and types of APIs.  **LO2** Apply the knowledge of API research to design an application that incorporates relevant APIs.  **LO3** Implement an application in a suitable development environment.  **LO4** Document the testing of the application, review and reflect on the APIs used. | | | Cromwell’s Indoor Plaza is an indoor craft and trade market situated in Truro, Cornwall. The Truro Local Authority (TLA) are launching a new initiative to promote their local market with the pretence of encouraging more foot traffic into their town centre.  To appeal to visitors, the TLA want to dedicate and develop a section of their website that will communicate key information about the market plaza. This part of the website will be similar to how Birmingham City Council promote their own open air market (see sources at the bottom of the brief for the link). However, to make the website more informative, and to benefit from the influence of search engines, they also want visitors to be able to find out further information about the specific stalls available. The idea of using APIs to make the individual stall webpages interactive (and to give the end-user alternative reasons to keep returning to the website) is appealing to the TLA.  The following stalls have volunteered to test run the new initiative; the bike accessories stall, the comic stall, the movie merchandise stall, the pet stall, the good food stall, the book stall, the music stall, the sports stall, the photography stall and the games stall. | | |
| **Task 1 – Theory** | | | | | |
| Answer the following questions in a professionally formatted report;   1. What is an API and why are they useful? What is their relationship with a Software Development Kit (SDK) **(P1)**? 2. What are the types of API available and what platforms can they be found upon? What are their uses **(M1)**? 3. Evaluate the potential security issues surrounding the use of APIs. What steps can be taken to reduce the issues (this can, for example, include the use of modifiers [public/private] and encapsulation) **(D1)**? | | | | | |
| **Submission Format(s)** | | Professional Report | | | |
| **Learning Aims/Outcomes:** | | **L01:** P1, M1, D1 | | | |

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| **Task 2 – Design** | |
| Complete the following documentation and publish it in your professionally formatted report;   1. Analyse the given scenario and identify an API(s) that would be useful for the given scenario. Prepare a proposal justifying the chosen API(s) (including a descriptive list of their available requests), ensuring that you explain why it/they would be appropriate **(P2)**. 2. Design (i.e. wireframes, Pseudo Code, Flowcharts) a web application that utilises the identified API(s) for the given scenario **(M2)**. 3. Extend upon the design to include the implementation of more than one API. Briefly justify the choices made **(D2)**. | |
| **Submission Format(s)** | Professional Report |
| **Learning Aims/Outcomes:** | **L02:** P2, M2, D2 |

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| **Task 3 - Construction** | |
| Complete the following tasks and submit the evidence (developed code) alongside your report. You will also be required to present your working API to your tutor;   1. Implement your design to build a web application that utilises an API **(P3)**. Extend the application to allow the end-user to manipulate the API request and, ultimately, the perceived results **(M3)**. 2. Extend the application so that it utilises multiple APIs, as outlined in your advanced designs created for Task 2 **(D3)**. | |
| **Submission Format(s)** | Developed code/API evidence and presentation of operational APIs |
| **Learning Aims/Outcomes:** | **L03:** P3, M3, D3 |

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| **Task 4 - Review** | | | | |
| Complete the following tasks and document them in your professionally formatted report;   1. Test your API using a ‘white-box’ testing approach (a low level testing approach such as Unit Testing and/or Integration Testing); document the outcomes using a suitable test plan **(P4)**. 2. Test your API using a ‘black-box’ testing approach (a high level testing approach such as Acceptance Testing and/or System Testing); document the outcomes using a suitable test plan **(M4)**. 3. Implement improvements as a direct outcome of the tests performed; clearly document the changes made in your report **(M5)**. 4. Critically evaluate the APIs implemented within your application. As part of the task, identify and discuss any data security issues; you may want to consider the types of data exchanged and the application of the GDPR laws (if necessary) **(D4)**. | | | | |
| **Submission Format(s)** | | Professional Report | | |
| **Learning Aims/Outcomes:** | | **L04:** P4, M4, M5, D5 | | |
| **Assessment Criteria** | | | | |
| **Learning Aims/Outcomes** | **Pass** | | **Merit** | **Distinction** |
| **LO1** Examine what an API is, the need for APIs and types of APIs. | **P1** Examine the relationship between an API and a software development kit (SDK). | | **M1** Asses a range of APIs for a particular platform that covers a range of uses. | **D1** Evaluate potential security issues surrounding APIs. |
| **LO2** Apply the knowledge of API research to design an application that incorporates relevant APIs. | **P2** Analyse an existing application that could be extended with a suitable API. | | **M2** Design an application that will utilise an API for a given purpose. | **D2** Create a design for a chosen substantial application that will utilise a range of APIs, justifying choices. |
| **LO3** Implement an application in a suitable development environment. | **P3** Build on an existing application framework to implement an API. | | **M3** Develop an application that utilises an API. | **D3** Construct an application utilising multiple APIs, following the designs in LO2. |
| **LO4** Document the testing of the application, review and reflect on the APIs used. | **P4** Design and complete a ‘white box’ test of the application, recording the results. | | **M4** Conduct ‘black box’ tests of your application, recording the results.  **M5** Update the application accordingly with the results. | **D4** Critically evaluate the APIs used within your application. Provide a data security report of your application. |

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| **Sources of information to support you with this assignment** |
| Additional sources of information are available on GOAL for this module, including additional reading material, demonstrations and practice examples.  Example Scenario; *https://www.birmingham.gov.uk/info/20150/markets\_and\_street\_trading/270/bull\_ring\_open\_market* |