**Marking Grid - Analysis**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1-2** | **3-5** | **6-8** | **9-10** |
| **Features of the problem** | No work | Described **some** of the features | Described the features | Described the features | Described the features |
| Why it is amenable to computational approach | Explaining why it is amenable to computational approach |
| **Stakeholders** | No work | Identified them | Identified them | Identified them | Identified them |
| Described them | Described them | Described them | Described them |
| Some requirements | How they make use of the solution | How they will make use of the solution | Explaining how they make use of solution |
| Why it is appropriate to their needs | Why the solution is appropriate to their needs |
| **Research** | No work | identified some features to incorporate into solution | Researched the problem looking at existing solutions to similar problems | Researched the problem **in depth** looking at existing solutions to similar problems | Researched the problem **in depth** looking at existing solutions to similar problems |
| Identify some appropriate features to incorporate into solution. | Identify and describing suitable approaches based on this research. | Identify and justifying suitable approaches based on this research. |
| **Features of proposed solution** | No work | Identified some features of the solution | Identified the essential features of the solution | Identified and described the essential features of solution | Identified essential features + **explaining** these choices. |
| Identified some limitations of the solution | Identified and described some limitations of the solution | Identified and explained any limitations | Identified and explained with justification any limitation of solution |
| **Hardware and software** | No work | Identified some | Identified most requirements | Specified the requirements for the solution including any hardware and software requirements | Specified and **justified** the requirements for the solution including any hardware and software requirements. |
| **Success Criteria** | No work | Identified some success criteria for the solution | Identified **some** measurable success criteria for the solution. | Identified measurable success criteria for the solution | Identified and **justified** measurable success criteria for the solution. |

**Marking Grid – Design Section**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1-4** | **5-8** | **9-12** | **13-15** |
| **Problem Decomposition** | None | Described elements of the solution using algorithms | Broken the problem into series of smaller problems | Systematically broken the problem down into smaller problems | Systematically broken the problem down into smaller problems |
| describing the process | Explaining the process | Explaining and justifying the process |
| **Structure of the solution** | None | Some work within algorithms | Defined the structure of the solution | Defined in detail the structure of the solution | Defined in detail the structure of the solution |
| **Algorithms** | None | Algorithms described elements of the solution | Described the solution fully using algorithms | Described the solution fully using algorithms | Described the solution fully using algorithms |
| Algorithms are appropriate and accurate algorithms. | Algorithms are appropriate and accurate algorithms | Algorithms are appropriate and accurate algorithms |
| Explaining how these algorithms form a complete solution to the problem | **Justifying** how these algorithms form a complete solution to the problem |
| **Usability Features** | None | Described some features | Described the usability features to be included | Described the usability features to be included | Described the usability features to be included |
| Explaining choices to be included in the solution | **Justifying** choices to be included in the solution |
| **Key variables, classes, data structures, … etc.** | None | Identified | Identified key variables, data structures, classes, … etc. | Identified + justified key variables, data structures, classes | Identified + justified key variables, data structures, classes |
| Identified any necessary validation | Explaining any necessary validation | **Justifying and explaining** any necessary validation |
| **Test data** | None | Some test data to be used during iterative or post development stage | Identified the test data to be used during iterative development | Identified + justified any test data to be used during the iterative development | Identified + justified any test data to be used during the iterative development |
| Identify further data to be used in the post development phase | Identified + justified any further data to be used in post development phase | Identified + justified any further data to be used in post development phase |

**Marking Grid – (a) Development (15 marks)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1-4** | **5-8** | **9-12** | **13-15** |
| **Iterative Development** | None | Some evidence of some iterative development | Evidence on most stage of the iterative development.  Describe what they did at each stage | Evidence on Each stage of the iterative development process.  Relating to the breakdown of the problem from analysis stage  Explain what they did at each stage. | Evidence of each stage of the iterative development process  Relating this to the break down of the problem from the analysis stage  Explaining what they did + justifying why. |
| **Prototype** | None |  |  | Provided evidence of some prototype versions of their solution. | Provided evidence of prototype versions of their solution for each stage of the process. |
| **Modularity** | None | Solution may be linear | Solution has some structure. | The solution is modular in nature. | The solution will be well structured and modular in nature. |
| **Code Annotation** | None | Code may be inefficient.  Code not annotated appropriately. | Code is briefly annotated to explain key components. | Code is annotated to explain all key components. | Code will be annotated to aid future  Maintenance of the system. |
| **Identifies names** | None | Variable names may be inappropriate. | Some variable and/or structure names are largely appropriate. | Most variables and structures are  appropriately named | All variables and structures are appropriately named |
| **Validation** | None | There are little or no evidence of validation. | Basic Validation | There is evidence of validation for most key elements of the solution. | There are evidence of validation for all key elements of the solution. |
| **Review** | None | There are little  evidence of review during the development. | There are evidence that the development was reviewed at some stage during the process. | The development shows review at most key stages in the process. | The development shows review at all key stages in the process. |

**Marking** **Grid – (b) Testing (10 Marks)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1-2** | **3-5** | **6-8** | **9-10** |
| **Testing during development** | None | Provided **some evidence**  of testing during the  iterative development  Process. | Provided **some** evidence of testing during the iterative development process. | Provided evidence of testing at **most**  stages of the iterative development process. | Provided evidence of testing **at each stage** of the iterative development process. |
| **Corrective Actions** | None | None or weak evidence on failed tests | Provided evidence of some failed tests  +  the remedial actions taken | Provided evidence of some failed tests  +  remedial actions taken  +    some explanation of the actions taken. | Provided evidence of any failed tests  +  remedial actions taken  +  full justification for any actions taken. |

**Marking Grid – Evaluation (20 marks)**

**(i) Testing to inform evaluation (5 marks)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1** | **2** | **3-4** | **5** |
| **Testing** | No work | Provided evidence of  some post development testing. | Provided evidence of final product testing for function | - Provided **annotated** evidence of post  Development testing for **function**.  - Provided **annotated** evidence for **usability** testing. | - Provided **annotated** evidence of post development testing for **function and robustness.**  - Provided **annotated**  evidence for **usability testing** |

**(ii) Evaluation (15 marks)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0** | **1-4** | **5-8** | **9-12** | **13-15** |
| **Evaluation:**  **Success Criteria** | None | **Commented** on the success or failure of the solution with **some reference t**o test data. | - **Cross referenced** some of the test evidence with the success criteria and  - **Commented** on the success or otherwise of the solution. | - Used the test evidence to **cross**  **reference** with the success criteria  to evaluate the solution  **- identifying** whether the criteria have been met, partially met or unmet.  - Provided comments on **how** any partially or not met criteria **could be addressed in further development**. | - Used the test evidence to **cross reference** with the success criteria to evaluate the solution .  - **Explain how** the evidence shows that the criteria have been fully, partially or not met in each case.  - Provided comments on **how** any partially or  unmet criteria **could be addressed in further development**. |
| **Evaluation:**  **Usability** | None | Vague or none | - Provided evidence **of the usability features** | - Provided evidence of **the usability features.** | - Provided evidence of the **usability features** **justifying** their success, partial success or failure as effective usability features.  - Provided comments on **how** any issues with partially or unmet usability features could be **addressed in further development**. |
| **Evaluation:**  **Limitations** | None | Vague or none | **-Identified** some limitations on the solution. | - Considered **limitations** of the solution. | Considered **maintenance** issues and **limitations** of the solution. |
| **Maintenance** | None | Vague or none | -Vague or None | Considered **maintenance** issues | Described **how** the program could be  developed to deal with limitations of potential  Improvements / changes. |
| **Reasoning and Structure** | None | The information is **basic** and communicated in an **unstructured way.**  - The information is supported by **limited** evidence and the relationship to the evidence **may not be clear** | -The information has **some relevance** and is presented with limited structure. The information is **supported by limited evidence** | There is a **line of reasoning** presented with **some structure**. The information presented is in the most part **relevant** and **supported by some evidence** | There is a **well-developed** line of **reasoning** which is clear and **logically structured**. The **information** presented is **relevant and substantiated.** |