|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task:** | | **1** | | |
| **Task Title:** | | **Portfolio** | | |
| **Task Code:** | | **AT2 POR-Task-1** | | |
|  | |  | | |
| Assessment type (): | | | | |
|  | Questioning (Oral/Written) | |  | Portfolio |
|  | Practical Demonstration | |  | Project |
|  | 3rd Party Report | |  | Other – Please Specify |

|  |
| --- |
| The base requirements this assessment task include:   * Web server, Python interpreter and database server * IDE or editor for developing Python programs (only PyCharm supported by the college) * Raspberry Pi with SenseHat * Access to Office 365 & Microsoft Word * Report Template (Portfolio: Part 1 Document Template) as supplied   Use of some of these items may not occur in this part of the assessment task. |
| Assessment Due This assessment is split into components that have several due dates:   * Week 09 17:00 (5:00PM) on the day of the scheduled lecture. * Week 11 17:00 (5:00PM) on the day of the scheduled lecture. * Week 14 17:00 (5:00PM) on the day of the scheduled lecture.   Refer to Blackboard for most accurate dates, which may alter due to unforeseen circumstances.  We also will endeavour to update these document(s) at the same time. |
| Instructions Follow the steps listed in this assessment item.  Submission of the documentation, code, and associated items is at the end of each part of the portfolio.  Each part of the portfolio has a deadline for submission.  It is advantageous to you to attempt to meet the deadline provided. |
| Important If you are using a different configuration of tools and equipment for this assessment item, then assistance in this and subsequent parts of the portfolio to ensure the systems work correctly will be limited. |
| Scenario You are currently working as a junior software developer at CUBE Music Pty Ltd, a Perth-based company that creates specialised music player software.  The company is looking into adding features that will allow smart multi-room music playback, including some form of “follow me”, which will use various IoT sensors.  Download the complete “Portfolio-Task-Scenario” from Blackboard. |
| General Instructions We provide a document template for your answers.  Download the Portfolio Part 1 Document Template from Blackboard, and then DOUBLE CLICK it to create a new blank document for your answers.  Save the file as:   * XXX-IoT-Port-Part-1.docx   Replacing the XXX with your initials.  For example, Adrian Gould would use AG-IoT-Port-Part-1.docx for his submitted filename. |
| Answering Questions When a step includes a question, you must attempt to answer it.  There is a minimum and maximum number of words to use for each answer.  If a step has more than one question, these maxima and minima are a total for all the questions in that specific step.  All answers must be in complete sentences unless indicated. |
| Sources of Information In industry, it is good practice to keep track of where information was obtained. This is especially true if it is a written document, or even code.  If you answer any questions using information from web sites, please include the site name and URL (Web site address) after the answer. Likewise, include the title and author for books and magazine articles. For example:   * RS Electronics Ltd: <https://au.rs-online.com/> * Slack API Documentation, Users List Method: <https://api.slack.com/methods/users.list>  Code Storage We advise that you create a GIT repository on GitHub and use this to store a copy of your work.  You may also use OneDrive within your college Office365 to store a backup of your code or keep a copy on a USB thumb drive. |
| *This space left intentionally blank.* |

| **STEP** | **Task to perform** | Words Min/Max |
| --- | --- | --- |
| 00 | Create Evidence Document Make sure you have followed the instructions on creating the answer document, as given in the General Instructions.  Familiarise yourself with the content and document your progress in this assessment.  Make sure that you complete the title page of the document.  At any stage during this assignment, you may consult the stakeholder(s) or their representative(s). |  |
|  | *This space left intentionally blank.* |  |
| 01 | Client business domain Carefully read the scenario the company has provided, and make notes on the key points, requirements, and information.  Once this is done, answer the following question(s):   * What is the client’s (CUBE Music Pty Ltd) business domain?    + FYI: your client is an internal client. | 20 – 50 |
|  | *This space left intentionally blank.* |  |
| 02 | System functionality You previously read the scenario and made notes on what the company aims to achieve.  You are now ready to answer the following question(s):   * What is the required system functionality?   + Name at least two functional requirements. * What are the non-functional requirements?   + Name at least two non-functional requirements. | 20 – 50 |
|  | *This space left intentionally blank.* |  |
| 03 | Business opportunities Using your notes and the scenario the company has provided, answer the following question(s):   * What are (some of) the business opportunities that CUBE Music’s director JT sees? * What could be a risk in trying to achieve those opportunities? * How would you qualify and/or quantify that risk? | 40 – 100 |
|  | *This space left intentionally blank.* |  |
| 04 | Stakeholders Using your knowledge of the product and prototype, answer the following question:   * Who are the (potential) stakeholders of this project? * Which of the stakeholders would you consult to determine the scope of the project or toß clarify the requirements? * Who do you need to consult to obtain final project approval? | 20-50 |
|  | *This space left intentionally blank.* |  |
| 05 | Identify Technologies for Hardware/Infrastructure The company needs to know what current technologies exist to allow the creation of a suitable solution.  For example:   * You may wish to identify that LoRa is a suitable technology to use in the solution. * Likewise, you may identify that the use of the existing wired network may provide some of the infrastructure requirements.   Given your current knowledge and additional Internet research, answer the following question(s):   * What hardware technologies do you think the company could use to provide a solution to the scenario? * What infrastructure technologies do you think they think may use to support the solution to the scenario? | 20 – 50 |
|  | *This space left intentionally blank.* |  |
| 06 | Identify Existing Commercial Products After collating the requirements, the company has for their situation, you will research commercially available products that may solve the company’s requirements.  You should identify three different products that maybe suitable for the scenario’s solution.  You may combine more than one product to create what may be a suitable solution.  The products must be commercially available and provide one or more required features for the solution.  Answer the following question(s):   * Which companies have possibly suitable products? * What products do they provide? * What is the cost per item for the products?   Use Australian suppliers or international suppliers who provide prices in Australian Dollars.  Complete the provided table with the details you have found. An example is shown below:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Item | Supplier | $ per Unit | Quantity | Total | | PIR Sensor |  | 5.00 | 0 | $ 0.00 | |  |  | 6.00 | 0 | $ 0.00 | |  |  |  | TOTAL | $ 0.00 | |  |
| 07 | Selecting Technologies for Prototype Development The in-house prototyping requires the consideration of options for the technology and hardware requirements.  When building the prototype, you will have many possible options for gathering data, storing data, device monitoring, and reporting the results.  Answer the following question(s):   * What hardware do you think you could use to create a prototype, or prototypes to solve this problem? * Which programming languages do you believe could be suitable to create the required code for the hardware you have identified above? * What software do you believe you could use to assist you in solving the problem? | 20 – 50 |
|  | *This space left intentionally blank.* |  |
| 08 | Determine Sensors and Actuators for each Feature No equipment is provided by the company, but they will purchase suitable hardware to allow the prototype to be constructed.  To begin, presume you will require a Raspberry Pi, and SenseHAT.  Other sensors, actuators and hardware may be required to allow the prototype to perform the required functionality.  Update the documentation with what equipment you will use to implement each feature.   |  |  |  |  | | --- | --- | --- | --- | | Feature | Pri | Equipment | Notes | | Detect presence |  | Raspberry Pi  Raspberry Power Supply  32GB MicroSD Card  Raspberry OS  PIR motion sensor, or ‘presence sensor’, or door sensor |  |   Presume that you will use a Raspberry Pi for the processor, and only list that with the first feature (we have provided a sample feature in the above table).  Each additional feature may require one or more sensors and/or actuators.  To complete this step, please update the table in step 4 in the answer document. |  |
| 09 | Add Clarification Notes Add any notes to explain any other requirements such as how frequently to make measurements.   |  |  |  |  | | --- | --- | --- | --- | | Feature | Pri | Equipment | Notes | | Detect presence |  | Raspberry Pi 3B/4B  Raspberry Power Supply  32GB MicroSD Card  Raspberry OS  PIR (motion) sensor, or ‘presence sensor’, or door sensor | Make reading:   * every 10 seconds, or * at a user interval. | |  |
|  | *This space left intentionally blank.* |  |
| 10 | Identify Prototype Base Costing Presuming that you will only be required to purchase new hardware for the prototype(s), complete a proposed cost sheet for the parts you require for the prototype.  Include any SBC, Microcontrollers, wires, electronic components, and other items as required.  You will need:   * Component/Part name * Supplier name * Price per unit * Unit quantity required for prototype   Ensure you include links to the supplier(s) and the products that you select.  All products must be sourced from Australian suppliers, or international suppliers who provide prices in Australian Dollars.  All prices must be in Australian dollars and include GST.  Here are some possible suppliers (You are not limited to these companies):   |  |  |  | | --- | --- | --- | | RS Components | Core Electronics | The IOT Store | | Sedonia Technologies | Paktronics | Little Bird Electronics | | UMart | Logicware |  |   You will provide prices from two suppliers. |  |
| 11 | Future requirements The final step is to identify and document future requirements of the project. The project scenario already gives you some background information about potential future requirements.  Talk to a stakeholder (or representative) to determine at least **two** different future requirements for the project. | 20-50 |
|  | Submission of Portfolio Work To submit the portfolio, do the following:   * Save the document with your answers as a MS Word file (.docx). * Open Blackboard, and locate the AT2 Portfolio Task 1 assessment * Open the assessment and upload the original word-processed document. * Click submit.   Whilst there is no need to use any other word processing software as you have access to Office 365 for free as a student, if you use Apple Pages, or Open Office, we will then require you to upload the original file **AND** a PDF version. |  |

# Appendix A: Code Style Guidelines

Your code will follow the PEP 8 standard.

Readability Counts  
- Zen of Python

Explicit is better than implicit.  
- Zen of Python

Other code standards available in the Presentation, “Python Coding Standards for North Metropolitan TAFE”.