**PLEASE READ TILL THE END OF THE DOCUMENT, THERE ARE BLANK PAGES INBETWEEN**

#### Outcomes (LOs)

1. Critically evaluate appropriate technologies, tools and methods available for developing dynamic web applications in a real-world context.
2. Select and apply an appropriate client-side language to develop and test a dynamic web application which includes database connectivity and web services.
3. Develop a web application using an appropriate programming language to filter and manipulate data and display it in a web browser.
4. Recommend and implement approaches within a web application to protect against potential security risks.

#### Task Overview

The task is made up of the creation of a Web Application utilising Django and following the tools and methods explored throughout the module. The application will include database connectivity and web services; filter and manipulate data; and implement adequate protection against security risks.

Your submission will consist of a Django project in ZIP format.

**Please note:** ensure you read the guidance at the end of this document.

### Structure/Guidance

#### Criteria

The Criteria is detailed at the end of this document.

### Task Brief

#### Introduction

Your company has been using a registered of the shelf Content Management System (CMS). Due to the recent merger with similar companies, a decision was made to design a new CMS system that will merge the data of all companies into a single system.

Since this is a large-scale operation, there are various sections of the project that are being prototyped by IT specialists (such as yourself). Your portion of the upgrade is to start to create a Corporate Address Book which manages the Contacts and Service Contracts. The system for this address book is as follows:

Design a Web application for managing a Corporate address book. A single company may have many points of contact. Each company has a single contract.

* + 1. It should display all relevant information for a company (e.g. name, address, contact details, contract type)
    2. One or more admin user accounts should be able to add/delete/update records.
    3. There are 4 types of Service Contracts each with their own prices and response times:
       1. Bronze
       2. Silver
       3. Gold
       4. Platinum

#### Development Tasks

The following are the minimum set of features which are expected to be included in your application:

##### Architecture

* + - * Django Application
      * Navigation

##### User Details

* + - * Allow Admin user to enter username/password
      * Check against internally stored username/password
      * Allow Admin user to edit password once logged in

##### Record Management

* + - * Allow all users to View records
      * Allow only Admin user to Create records
      * Allow only Admin user to Delete record
      * Allow only Admin user to Update record

##### Front End

* + - * Using Controls
      * Using Web Forms
      * Overall Design: CSS, Templates

##### Database Management

* + - * Use of Server-side scripting
      * Using Django Migrations for database management

##### Security

* + - * Use of Sessions / Cookies

### Assessment Requirements - Please ensure you read in detail

Your code should adhere to and consider the following guidelines. In general, you can code your solution in any way you feel comfortable as long as it is based on what has been covered in the module. Keep in mind, that the very minimum requirement is to produce functional code (i.e. the code doesn't break with errors).

* This needs to be a fully functional Django web application that follows the MVT software design methodology. Hence you must use Templates, Views and Models.
* Django Admin Page: The assessment will be marked according to the web application’s front-end and not from the Django Administration portal. You can use the admin page for testing, but we will assess what you have coded.
* Use Python 3+: You can set Cloud9 to use Python 3.6 in the Preferences. If you prefer to use a different IDE for your development, please make sure that you are not using Python 2.
* Use Django 2.2.1: Although Django version 3 has just been released, Django 2.2 is very stable and there is extensive documentation and support for this version Please not use Django 3
* Choose appropriate names for variables and functions: This helps one to understand and follow your code more easily. It is recommended that you follow the PEP 8 python coding conventions as this is does make your code more logical and readable
* You are expected to comment the code extensively: This is a strict requirement as it shows ownership and good understanding of the code you present. It is particularly important to show any choices you may have considered and discarded and part of critical evaluation of options. For full details on how to comment your code, please see this page on the VLE.
* Do not use exceptions: If you need to validate user’s input, do not use exceptions; instead,

consider the built-in methods for strings from the str library (e.g. isaplpha(), isdigit(), etc.)

* Use classes and objects: It is advised to follow Model View Controller/ Model View template software design approach to make the structure of your project more readable and manageable
* Numerical values should be presented as expected: Any integers (e.g. the number of customers) should appear without any decimals (as expected) and any float numbers should have two decimal digits
* There is no strict requirement about the size of the code (the number of lines): There are many ways to code the assignment which can results to varying size of files. It is recommended that you create compact and yet readable code (which is functional as well)

**How these criteria relate to your task**

* Evidence of criteria one would be supported with the introduction of methods, techniques, technologies, libraries and other factors which have not been discussed in class, but rather discovered by the student as part of their research. These could potentially have been signposted in class, but not discussed in detail.
* Evidence of testing (part of criteria 2) would be apparent through the quality of the application they are submitting and the data set apparent in the application. In the first instance, the application needs to work as intended. If this is not the case, it shows a lack of testing. It should also handle edge and exception cases. Again, this ability evidences the quality and amount of testing. (Data migrations could also bolster this as a means of evidence)
* Criteria 4 below is evidenced by good security practice in the application. Evidence of CSRF handling, data sanitisation and validation, together with the ability to resist common attacks like XSS and SQL Injection are what we would be looking for in assessing the criteria. (These are addressed specifically in week 9)

**Criteria**

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| **Criterion** | | **0-29%**  **Fail** | **30-39%**  **Low Fail** | **40-49% 50-59% 60-69% 70-79% 80-100%**  **Pass** | | | | |
| **Knowledge and Understanding** | *Ability to critically evaluate appropriate technologies, tools and methods available for developing dynamic web applications in a*  *real world context. (10%)* | **inadequate** with unclear and/or precise understanding of the thoughts and practices related to the web development indicated. | **Limited** introduction to a basic appreciation of a wider field with some clarity and precision to the thoughts and practices related to web development | **Satisfactory** knowledge base;  Some appreciation of a basic wider field with clarity and precision to the thoughts and practices related to web development | **Good** appreciation of and explicit links to a wider field.  Emerging application of thoughts and practices in the field of web development | **Very good** and clear understanding of, and implementation, some aspects of a wider field. | Thorough and deep knowledge and understanding of web development explicit evidence of the wider contexts of the topic.  **Excellent** and detailed usage of recent emerging practices in web development | Thorough and deep knowledge and understanding of web development.  **Outstanding** and detailed usage of recent emerging practices at the forefront of web development |

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| **Criterion** | | **0-29%**  **Fail** | **30-39%**  **Low Fail** | **40-49% 50-59% 60-69% 70-79% 80-100%**  **Pass** | | | | |
|  | *Selection and application of an appropriate client-side language to develop and test a dynamic web application (25%)* | **Inadequate** knowledge base; Inadequate understanding of developing and testing a web application. | **Limited** and often implicit knowledge base with some omissions and/or lack of *of ability in developing and testing a web application.* | **Satisfactory** and increasingly explicit knowledge base in developing and testing a web application. | **Good** knowledge base; explores and explicitly extends abilities in developing and testing a web application. | **Very good** knowledge base, exploring and analysing the discipline, with clear originality and autonomy. Clear application of good practice. | **Excellent** knowledge base in the field of developing and testing a web application. Best practice clearly visible with excellent evidence of testing capabilities | **Outstanding** information and knowledge base which proposes new and novel ways of approaching traditional challenges in web development and testing. Evidence of innovation and extension beyond standard practice. |
| *Development of a web application using an appropriate programming language to filter and manipulate data, and display it in a web*  *browser. (25%)* | **Inadequate** application of acquired knowledge. Little evidence of a running application, or an application which is unusable due to errors. | **Limited** ability to deliver the requested scope, with some omissions and/or errors.  Some aspects of the application can be used but no cohesive delivery of functionality. | **Satisfactory** delivery of an application which can meet the intended scope. Some errors are visible, but users are still able to meet the intended purpose of the application. | **Good** application of tools and techniques (example migrations) resulting in delivery of the intended scope. Application works as intended, with evidence of correct validation, manipulation of data and correct display in browser. May have a few minor errors. | **Very good** application of tools and techniques (example migrations) resulting in delivery of the intended scope.  Application works as intended, with correct validation, manipulation of data and correct display in browser. | **Excellent** application of tools and techniques to deliver required scope. Evidence of best practice, not only in terms of database access, but also in UX design and use of techniques exceeding what was covered in the module. | **Outstanding** implementation showing skills and finesse well above what was covered in the module. Novel approaches and excellent use of supporting technologies. |
| *Recommendation and implementation approaches within a web application to protect against potential security*  *risks. (15%)* | ***Inadequate*** *knowledge base; Inadequate understanding of security principles and no evidence of session handling in the application.* | **Limited** ability to identify and manage security concerns in the application. Incorrect session handling and cookie usage. | **Satisfactory** identification of security risks and adequate mitigation.  Good use of session handling. | **Good** knowledge base; Risks identified and mitigated, together with implementation which suggests other exploits (example SQL attacks) are being considered and addressed. | **Very good** knowledge base of the security concerns within the application. Risks identified and mitigated against, including external threats (example SQL attacks) | **Excellent** information base and awareness of security concerns within and outside the application.  Excellent implementation and evidence of defensive posture. | **Outstanding** information and knowledge base which demonstrates a superb posture to defending the application. |

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| **Criterion** | | **0-29%**  **Fail** | **30-39%**  **Low Fail** | **40-49% 50-59% 60-69% 70-79% 80-100%**  **Pass** | | | | |
| **Cognitive Skills** | *Personal research skills, self-direction & innovation (25%)* | **Inadequate** with an over reliance on very restricted range of research. No evidence of innovation or self-direction. | **Limited** use of a range of personal research. Some evidence of directed material although this may not be consistent throughout. | **Satisfactory** use of a wide range of personal research which adds value to the project and is largely consistent throughout. Evidence of new ideas showing independent study and experimentation. | **Good**, clear evidence of considerable personal research and the use of a diverse range of appropriate sources but may not provide a measure of innovation by introducing methods and ideas not discussed in class. | **Very good** and substantial research and evidence of an innovative use of a wide range of methods and ideas. | **Excellent** evidence of an innovative or original use of extensive personal research. A substantial measure of innovative idea and methods used throughout the project. | **Outstanding** evidence of an innovative or original use of extensive personal research and experimentation which delivers a set of functionality well above the required standard. Large number of Innovative ideas in implementation and feature enhancement. |
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**General Guidance**

* There is a strict policy regarding authenticity of tasks. In proven instances of plagiarism or collusion this will go through the malpractice process. You are advised to read the rules and regulations regarding plagiarism and collusion.