**ASSESSMENT AND INTERNAL VERIFICATION FRONT SHEET (Individual Criteria)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course  Title | B.Sc Software Development | | | | Lecturer | Ryan Attard | | |
| Unit Number & Title | | | [ITSFT-606-1620-Programming for the Cloud](https://moodle.mcast.edu.mt/course/view.php?id=506) | | | | | |
| Assignment Number, Title / Type | | | Building a cloud based website | | | | | |
| Date Set | | |  | Deadline Date |  | | | |
| Student Name | |  | | ID Number |  | | Class |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Student’s declaration prior to handing-in of assignment:*   * *I certify that the work submitted for this assignment is my own and that I have read and understood the respective Plagiarism Policy* | | | |
|  | ***Student’s declaration on assessment special arrangements (Tick only if applicable)***   * *I certify that adequate support was given to me during the assignment through the Institute and/or the Inclusive Education Unit.* * *I declare that I refused the special support offered by the Institute.* | | | |
| Student Signature: | |  | **Date :** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment Criteria | | Maximum Mark | Mark Achieved |
| AA1 | Choose and apply appropriate data storage solution(s) for a given scenario | 7 |  |
| Ku4 | Construct a scheduled job in a given scenario | 5 |  |
| AA3 | Use Cache Services or other related technologies to make more efficient use of the resources available | 7 |  |
| KU5 | Construct a service while making use of a cloud service feature that can be consumed by a 3rd party | 5 |  |
| AA4 | Analyse a number of requirements with respect to your application needs (such as caching, website availability, etc) and configure these in your context | 7 |  |
| KU6 | Arrange a way how to easily upload your artifacts on the cloud | 5 |  |
| AA5 | Apply a number of security configurations to secure your artifacts (e.g. APIs, Data,etc) | 7 |  |
| SE3 | Design and develop a web application that makes use of a number of cloud services while also consuming an implemented API service residing in a different location | 10 |  |
| Total Mark |  | 53 |  |

Assignment

## Programming for the Cloud

Assessors: **Ryan Attard**

Assessment Type: **Home assignment**

**Assignment Guidelines**

Read the following instructions carefully before you start the assignment. If you do not understand any of them, ask your invigilator.

* This assignment is a HOME assignment.
* Fill in and print the assignment sheet and produce a properly structured, neat documentation.
* Copying is **Strictly Prohibited** and will be penalised according to disciplinary procedures.
* Use the given cloud account responsibly
* Deadline: 3 weeks from issue date
* This assignment has a total of 53 marks.
* Submission must be done through Moodle
  + Zipped code must be supplied
  + Document/Text containing the public link to your website (if you managed to answer the relevant task)

Create a simple single web page application which allows the user to send files to someone else (similar to WeTransfer.com).

* The user must login.
  + Oauth 2.0 for the login;
* Upon login, the user can see a list of owned files;
  + List should always be loaded from cache;
* The user can upload files
  + After upload is confirmed, the cache should be refreshed with a newly updated list of user owned files;
  + Files have to be stored in a *Fine-Grained* Cloud Bucket with a permission of a Reader role added for the user you are sharing the file with;
  + Data describing the file and the file ownership have to be kept in a structured relational database;
  + Logs have to be kept in the cloud including the email address who downloaded the file, which file, and when he/she downloaded it.
  + Error reporting must be done as well online [in a different section on the cloud]
* The user can share (send the file) to anyone
  + Once a user shares a file, a message (the email content + recipient) must be published to a topic.
  + Email Content and Recipient must be encrypted using either keys stored on a Key Ring (on the cloud) or using Key Management Services before stored in the topic.
  + Every minute a cron job subscribes to this topic, reads the unsent messages, decrypts them using the proper keys and send them to respective clients via an email service.
  + The user receives a link to download the file directly from the bucket.
* The user shall access the website via a public url having a (self-signed) certificate installed from a Google Compute Engine.

Assessment Rubric

|  |  |  |  |
| --- | --- | --- | --- |
| Criterion | Description | Max. Marks | Marks Achieved |
| AA1 | Use a proper storage solution   * Respective user and file data are kept in this storage solution   + Uploading of item & writing item info in db should use a Transaction * Respective user and file data are retrieved from this storage solution | 2.5  1  3.5 |  |
| KU4 | * A scheduled job is properly constructed to send out emails (as requested) | 5 |  |
| AA3 | * File descriptive data should be loaded from Redis Cache or Memcache for every user; | 7 |  |
| KU5 | * Upon sharing a file, emails shall be sent to the respective person(s) after pulled from a Topic using Pub/Sub technology; | 5 |  |
| AA4 | * Create a VM; install IIS, Host Website (all must be complete) | 7 |  |
| KU6 | * Files has to be uploaded and stored in a valid non-structured or non-relational storage solution (i.e. Cloud Buckets) dynamically * Fine Grained & respective ACL lists shall be set up dynamically on the individual files | 2.5  2.5 |  |
| AA5 | * SSL is properly set up * Encryption/Decryption must ensure that requested info is protected | 3.5  3.5 |  |
| SE3 | * Uses Oauth2.0 to authenticate the owner of the website * Logs must be kept in the cloud of any file access, as it happened * Error Reports must be kept in the cloud | 5  2.5  2.5 |  |