Universitá
Ca'Foscari
Venezia

Master course

in Computer Science and Information Technology

Software Architectures

-

Task 1

Group 5
Bastianello Lorenzo, 874268
Bonomi Silvia, 867138
Bruno Francesco, 875812
Quaglia Beatrice Maria, 875332

Academic Year
2022 / 2023

Introduction

Background

Submit a pdf file with your Katas about an hackerrank-style information system.

Description

The system proposed is an hackerrank-like application that should be adopted by universities or companies in order to evaluate subscribed candidates/students and also it allows them to study theory material previosly loaded inside the platform.

Users

Type of users

- **normal user**
- **admin**
- **staff**

Number of users

We predict about 1500 normal users connected at the same time inside the platform, a small amount of them (about 50) are part of admins and staff. We also predict 20'000 total users per year subscribed to the platform, divided by normal users, admin and staff.

Requirements

Requirements

- Each company or university is assigned to a channel and each one contains a variable number of courses;
- Staff members must handle the creation of new channels and also work as helping center so to give users the support needed;
- Each course is administrated by one or more admins by a control panel;
- Admins and users should be able to contact staff if support is needed;
- Courses could contain:
  - Theory material section;
  - Evaluated/Non-evaluated assignments section;
- Admins can add stuff (assignments, theory materials) to each section of their own courses;
- An assignment could contain multiple type of exercises such as one with multiple choiches, open questions, upload of a file;
- An assignemnt could have an expiration date;
- Each assignment can be saved if not finished yet and can be continued every time a user want (obviously by considering the expiration date);
- Coding languages supported for IT assignment are C, C++, Python and Java;
- Each assignment check must be executed on an isolated environment so to garantee security;
- An assignement might have an anti-plagiarism system;
- Each assignment has a final report visionable from both admins and the normal user who took the exercises;

- An admin can view the progress of the assignments done by the normal users;
- Users and assignments data must be persistent;
- Each channel/course/assignment must have a shareable link;
- Application must be scalable and elastic so to prevent low performance due to an increment of users subscribed or simultaneously connected;
- Application must be modulable in order to have an easier maintenance;
- Application must be available every time is needed and also should not crash if an error happens;

Additional Context

- Availability and fault-tollerance are first-class concerns, also elasticity;
- Scalability allows the project to have a balanced cost in comparison to the performance obtained;
- We think the application will be used in the future by many companies/universities so total users might go up;
- User-experience is a must;
- The project must be developed using open source/free technologies;
- Automated deployment system could be used;
- Platform should be secure;