School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title: CoderDojo Zen Projects

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Student ID: 14541017 **Stream:** CASE

Project Supervisor Name:

SECTION B

Proposal Description

General area covered by the project

This project generally covers the following four topics with regard to showcasing youths' projects through the CoderDojo Zen community platform:

- Creation
- Discovery & Interaction
- Organization
- Management

As part of Discovery & Interaction, there is a strong focus on implementing runtime environments for projects written in different programming languages. Within the scope of the project I will be supporting runtime for Scratch, Python and JavaScript projects.

Outline of the proposed project

- Background

  In 2015, the CoderDojo Foundation (CDF) built the CoderDojo Community Platform which aims to provide the CoderDojo community with infrastructure to run their Dojo and to connect the global CoderDojo community.

  One of the core features for 2017/2018 that they would like to add to the platform is the projects functionality. This is a youth orientated and targeted feature which allows young people to upload projects and share with the CoderDojo community through their own profile and their Dojo.

- Achievements

    - **Showcase youth projects:** Projects created and uploaded by youths will be available in an interactive form on their profile pages, Dojo pages and other pages on Zen. They will also be showcased in the form of photo galleries.
    - **Project versioning:** Projects will have versioning using an existing version control system (VCS) which I will need to decide on.
    - **Progress tracking and statistics:** Parents and Mentors will be able to more easily track the progress of youths through viewing their projects and also use these projects as evidence for awarding digital badges. For the CDF, more statistics will be made available through an “admin panel” relating to the use of their content in projects.
    - **Improved learning resources:** Projects will be grouped using tags by language, sushi card, Dojo and region in order to provide better examples to users looking to work on their own projects or learn particular languages.
    - **Project management and sharing:** Parents, Mentors, Champions, youths and the CDF will all be able to manage projects in different ways. Projects can also be shared to various social media by any users of the site provided the youth has allowed this in their project settings.

- Justification

    The ability to showcase projects on Zen is something that the CDF sees a lot of value in for their users, especially youths. With support for interactive Scratch, Python and HTML, CSS and JavaScript projects being implemented by me, the CDF will hopefully be able to easily build on this in the future to support even more languages. This will allow youths to share even more of their creations in the future.

    While the project is mainly aimed at youth “Ninjas”, it also has benefits for other members of the CoderDojo community such as Parents and Mentors who will be better able to track progress of youths and show evidence for awarded digital badges. The CDF themselves will also see benefits for their own statistics and onboarding more community members onto the platform to share their creativity.

Programming language(s)

- JavaScript
- Scratch
- Python
- SQL
- GraphQL (possibly)

Programming tools / Tech stack

- VueJS
- AngularJS
- NodeJS
- SenecaJS

- HapiJS
- PostgreSQL database

Learning Challenges

- **Runtime:** I will need to implement the running of Scratch and Python code in a browser within Zen's existing architecture and abstract it enough that more languages can be easily supported in the future.
- **Project versioning:** Project files will need to be hosted under specific accounts under the CoderDojo organization using the API of an existing VCS (Likely GitHub GraphQL API v4).
- **Scratch, Python & GraphQL:** I have no prior experience in using Scratch, Python or GraphQL (which I will need to use If I choose to use the GitHub GraphQL API v4)
- **Security issues:** There are security issues here which have to be dealt with regarding inappropriate content or language and/or malicious code in projects. I haven't dealt with these types of issues before on such a scale.

Hardware / software platform

Fedora 26 on a Hewlett-Packard laptop with an Intel i7 processor and 8GB RAM.

Special hardware / software requirements

None.