Programming Challenge

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Challenge Design Summary

Background

As part of a university sponsored entrepreneurship and innovation campaign, your team has decided to embark on creating a company that focuses on answering a crucial question posed by most university students at one point or another: where can you find the cheapest pizza? Your team is tasked in designing and implementing (from the ground up) an online service that utilizes web scraping to ease the burden on students' wallets, and satisfy the ever rising desire for that cheesy 'za.

Objective

Your team is to design and produce a web service to find the cheapest pizza within a variable radius of a given address: both of which are entered by the user. The backbone for the service **must** be a *web scraping application / script* and can be combined with other modules as seen fit to complete the service.

Design Requirements

Since this service is being used by students whom may not be beside their personal computers, the service must be designed to be responsive such that it can be properly used on mobile devices and desktop browsers. The UI and operation of the service must be UX focused to ensure a quality experience that makes first time users want to become recurring users.

To accommodate various individuals and their location and preferences, the service must take input directly from the user. User inputs include: the current address of the user, a search radius (in kilometers, the number of pizzas, size of pizzas, and toppings per pizza.

Since there must be a way to prove to the user that they have found the cheapest pizza in the area, the website must display the total price for the user's desired order at the establishment with the cheapest pizza, and any other establishments that have been found during the scraping process.

It is at the team's discretion on how to communicate information between various modules and layers of the service (i.e. custom information piping, database queries, file parsing, etc). There is no imposed design requirement for the internal information communication process to grant flexibility to the designers.

Deliverables

Each team must deliver the following items:

- A functional web page for taking user input and displaying data

- Code for any back-end implementation of the web scraping modules and other system resources
- Documentation regarding the design and structure of the system (may include tables, UML class diagrams, descriptions of methods and classes, flowcharts for logic and system processes, etc)
- A PDF presentation (can be exported from a PowerPoint file, Google Slides, etc)
    - This presentation file is primarily a visual aid used during the final presentation

Final Presentation

Each team will present the impact of their design in terms of technical efficiency and ease of use, through a formal presentation and a live demonstration of their code and product. A PDF "powerpoint" presentation will also be used for visual aid during this formal presentation.

Judging / Evaluation

Teams will be judged based on the originality of their solution, the efficiency of the design, user appeal, and code construction. The grading criteria and matrix is provided below for reference.

Solution	• Quality of code (readability and understanding) • Completeness (Testing, bugs, QA) • Project documentation	50%
Project Design	• Interface and usage • UI/UX	25%
Presentation	• Content • Professionalism • Answers to questions from judges	20%
Innovation	• Originality, unique and reasonable solution	5%
Competition Misconduct	• Failure to abide by the rules	-100%
TOTAL		100%

Competition Details

Allowable External Resources

- And background research conducted by team members prior to the competition
- Any electronic material stored on CDs, USBs, or other storage mediums
- Any textbooks, course notes, or other reference material
- ONE computer per member

Note: Pseudocode is allowed to be created and brought to the competition (so long as it is plain English Pseudocode), NO source code is allowed to be prepared outside of the competition design phase.

Recommended Software Resources

Languages

- HTML/CCS
- Javascript
- JQuery
- PHP
- Ruby
- .NET (C#, VB, VBScript)
- Python
- Perl
- C
- C++
- Objective C
- Java
- Swift
- SQL

IDE

- JetBrains (IntelliJ, PyCharm, WebStrom etc)
- Eclipse
- NetBeans
- Microsoft Visual Studio
- Visual Studio Code
- XCode

Text Editors

- Vim

- Sublime
- Brackets
- Atom
- KWrite
- TextEdit

Servers

- Oracle
- IBM DB2
- Microsoft SQL Server
- Microsoft Access
- MySQL
- PostgreSQL
- MongoDB

Other Tools

- ReactJS
- NodeJS
- MeteorJS
- Boostrap
- MEAN Stack
- Heroku
- Microsoft Azure
- Amazon Web Services
- Ionic
- Cordova

Referencing

Since the use of the internet and external resources are permitted, all information used by the competitors must be referenced very carefully.

Competitors are not permitted to submit work completed by anyone other than the members of their team. If they decide to recycle their own or someone else's code it must be clearly cited in the presentation. In addition, the competitors also need to clearly explain why and where the recycled code was used in their software. The judges hold the right to ask any team member to describe what a particular section of the code does at any given point during the presentation. If there is any evidence of competitors submitting plagiarized work, the entire team will be eliminated from the competition and the faculty will be notified. Volunteers will monitor each team during the design process to deter teams from cheating and to remind them to cite external resources. However, competitors are expected to act in good faith with the spirit of the competition.

Procedure and Timeline

Competition

Presentation and Question Period

The problem will be presented to all competitors and judges at the beginning of the competition, followed by a maximum 15 minutes question period.

Solution Development (Design Phase)

Teams will be given 5-6 hours to develop their solutions, produce all required deliverables, and prepare their presentations. All deliverables shall be submitted to a Github repository that will be set up by the competitor director. This includes the final PDF “powerpoint” presentation. Competitors may finish before the end of the allocated time.

Final Presentations (Judging)

Competitors will be given a maximum of 20 minutes to present their solutions. All team members must be present and participate in the presentation or be penalized by the judges. Judges can ask questions at any time during the presentation, contributing to the 20 minute timeline.

Timekeeping

Design Phase

Time remaining will be announced to the competitors 2 hours, 1 hour, 30 minutes, 15 minutes, and 5 minutes before the deadline:

Presentation

Time remaining will be announced 10 minutes, 5 minutes, and 1 minute before the end of the allotted time.

Presentation Order

Presentation order shall be determined randomly and shall be announced two hours before the presentations commence.

Deliverables

For Competitors

Each team will receive a Github repository link that will contain a package outlining the problem definition, design requirements, rules, marking scheme and any other information deemed necessary. The team members are only allowed to download or clone the repository on their personal laptops, they cannot fork the repository.

From Competitors

Team members are required to push any progress made while developing the solution to the problem to the same Github repository link every hour.

Any attempt to push additional code to the repository will be considered a violation of the rules and will result in an automatic disqualification from the competition. In addition, the faculty will be notified.

The presentation for their proposed solution, must be pushed to the Github repository as a PDF before the end of the design period. There are no specific requirements for the presentation, as judges will focus primarily on quality of the code and the solution. The “powerpoint” shall be used purely a visual and organizational aid during the presentation.

The team is allowed to use their own computer for the presentation, but must only use the files downloaded from the Github repository. The competition director will be responsible for ensuring only files downloaded from the repository are used for the presentation, as well as observing how teams execute any external code their programs utilize to ensure the files used are also the ones submitted to the repository.