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| **CS102** | **Fall 2020/21** | Project Group | 1d |
| Instructor: | **Uğur Güdükbay** |  |  |
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| **Criteria** | **TA/Grader** | **Instructor** |
| Presentation |  |  |
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~ Sustainibility Coach ~

SavioursOfTheGreenWorld

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# Introduction

This project, named Sustainability Coach, is a coaching program that guides users to  [pursue](https://tureng.com/tr/turkce-ingilizce/pursue) an eco-friendlier life style. The main objective is to change living habits by gamification and a mild social competition. In simple words, the project consist of three connected parts. First one is a list of daily achievements supported by a reward system. The second part contains a forum where users can comment on news related to environment and discuss. The third part includes a news section where admins can enter news that users comment on or share. The connection between these parts are explained in the next section. The user will have to eventually verify all the tasks they have done themselves, that being said, we do not check whether the user cheats in the program. Gamified Sustainable Life Style coach will help the environment and contribute saving the green world. After all, we are all Saviors’ of the Green World. Hence we, the developers, are working on this program to remind our individual effort can make a world more livable habitat.

# Details

## Project Topic and its Importance

World is warming with acceleration according to statistics. There are fierce debates about the effects of climate change. Disasters and havoc are taking toll on every continent due to excessive disruptive human activity. Farms are being destroyed and people are being forced out of their homes. So much is happening unnaturally due to by products of human activity. The political debate whether we should care for the planet or not has become whether who will pay the price of the ignorance. Policy makers are discussing the steps that should be taken by their governments and their successors. Mass debates are happening around the world on how to solve the climate change issue. From causing a artificial volcano explosion blocking the sun rays which would decrease the hot house effect, completely disregarding the earth and heading towards the space (Mars it seems in the short term).

World is suffering and we are as a consequence suffering as well. The idea that technology would solve all problems seem to have limits. The most effective solutions seem in policy changes and public awareness. There have been being tried to raise public awareness and that showed how “small” simple changes in lifestyle can make a big difference.

Every incremental change will have an effect that will cascade and grow under sustainability. From the repetition of the individual some thinking styles becomes the mindset of the whole generation. Thus, by at least providing ways for people to become helpful for the planet, we decided to make Sustainability Coach. There are many live programs and counselling services offering advice on how to live sustainable. However, those programs are not that accessible and mostly, entertaining. While being observed all those such services, Saviors of the Green World aims to combine all elements of learning with Sustainability Coach. Technology, Entertainment and Design (TED) are our core principles while we design Sustainability Coach.

So, with the app, everybody will have at least the opportunity to learn how to live sustainably. Our app thus, intends educating people to live more sustainable in an entertaining way. One will eventually understand that living sustainable is also good for budget. This aspect also makes the app perfect for gaining habits that help budgeting.

## Differences and Similarities to Existing Projects

There are three main mobile apps that are like our project in serval regards. These are Duolingo, Fabulous Daily Routine Planner (abbreviated FDRP for convenience) and Dr. Wolf.

The common feature of these apps is that they guide users to do better in their relevant topics in a gamified way. The topic is learning a language in Duolingo case, life habits in FDRP case and chess in Dr. Wolf.

The layout of Duolingo and its concept is like our project. The objectives are ordered from easy to difficult and the user is rewarded by points. It also has streak feature where if you do the tasks daily, you are rewarded. Heart feature allows user to do five wrong attempts, which prevents tasks to become trivial by trying countless times and not learning anything. It also allows to share progress. The tasks and missions in Duolingo have a graph structure we would like to imitate because of its unique style and the sense of connexions between the tasks.

FDRP first conducts a survey on the user and then helps to set up personal goals like drinking water. It does so by telling a story. The common and relevant feature of Duolingo and FDRP is that they remind the user do the tasks daily.

Doctor Wolf is a bit different. It coaches the user to do better in chess. The relevant feature to our project is that there is an NPC (non-player character) who talks to the user. These listed features could be added to our project though our project is more likely to be a web applet due to time constraints and expectations in CS102.

Differences between Duolingo, FDRP and Dr. Wolf is that all these apps targets personal development. Our concern considers both the globe and the individual. The motto could be “Not development for self but for the globe.” So, it is more of a social response. Social forum and news feed are possible in our case. In that forum people will comment on and discuss about news regarding the planet. News will be supplied by the app. These features are not part of the apps listed. There are optional aspects we would like to develop as well. For our concern, we would like to mint NFT’s for specific achievements. A NFT is a token recorded in Blockchain that gives unique ownership of the digital asset via smart contracts to a wallet adress. Because the Blockchain Technology is new, no other app has incentivized using the app with real world tradable assets. Hence, we solve the problem with the scoring systems in the games that are only sought only for the game.

We present the SWOT analysis for our project:

A picture containing table

Description automatically generated

## Technologies and Libraries Used

**Java SE 19:** Our project is abstracted in Java. As a natural consequence, the applet will function the way Java functions.

**AWT (Abstract Window Toolkit) and Swing:** Since the desktop software of our project will be written in Java, we will use these GUI tools for graphical interface. We also choose those because Professor Güdükbay taught the very essentials.

**Python and MATLAB:** We will use some of the Python libraries such as Pandas and NumPy for data manipulation and management. Although we may not use Python in our Applet directly, some decisions and modeling will be experimented with Python. Similarly, MATLAB may be used for its Data manipulation and visualization aspects but not in the applet directly.

**MySQL:** To store, manipulate and use the data, we will use MySQL, a relational data base. We will store user data, forum data, achievements data etc. with MySQL.

**DALL-E:** Our project will contain lots of visual elements such as images and graphics. At this point DALL-E will help us to create interesting images using AI. We may choose to use GPT-3 for image descriptions to input DALL-E as well.

**GPT-3:** We will synthesize content from this powerful AI agent. We will use API’s for in-app generation as well as pre-loaded content in case network issues arise.

**Apache Spark’s Machine Learning Library:** Will be used to track progress and offer level adjustments in Sustainability Coach. *Machine Learning part may be optional.*

**GitKraken and Git:** Since we are working as a group, we should collaborate to complete the project. To accomplish this, we will use GitKraken and Git to control our project.

**Solana Protocol:** Solana has introduced PoH which is an innovative consensus mechanism among Layer 1 protocols such as Ethereum. PoH makes Solana faster, cheaper and stronger than Ethereum itself. Only drawback seems to be occasional congestion issues which are being tended by the Solana Foundation. We will use Solana and its ecosystem to generate NFT’s created by DALL.E for achievements in our applet.

**Umlet:** To generate UML diagrams and visualize them.

## The final product

The main objective is to change living habits by gamification and a mild social competition. Three parts of the projects are as follows. First part is a tree of daily achievement that will be completed one by one. As an example List of achievements includes using public transportation instead of personal car or using your own thermos instead of a plastic cup in the coffee shop etc.

We are assuming the user is well informed about himself which is the case in most cases. Hence they will provide self-validated information to the program where they will be rewarded. So, why would anyone interested in providing true information? To overcome this problem we would like to in-game tokens which will be digital gold. We plan to have basic anomaly algorithm that detects random inputs. So that, the penalized scores will motivate players to do their best to be honest. The other user type who is honest all the time doesn’t need any check. User completes tasks and reports it to the program. Then program gives points or tokens. The goals are drawn in a tree diagram where objectives get more challenging, and achievements are sorted according to their content. It should be noted that, this application is a gamified way of improving habits, so we are not detrimentally focused on decreasing the cheating rates but to help forming sustainable habits.

The forum will be a social interface where users can comment on news related to environment and discuss. People’s ranks that they gained through achievements are displayed in this forum next to their names. Their ranks also displayed in an online list in the forum. The third part is a news section where admins can enter news that users comment on or share. The news is not published by everyone due to quality and [disinformation](https://tureng.com/tr/turkce-ingilizce/disinformation) concerns. Admins are again users, but they have additional responsibilities.

The tasks and sustainability advice are gamified hence, when the player creates and account and logs in, they will be directed to their game tree. There they will be able to see what they have done and what will be doing. Once they player does the tasks accordingly and validates, they will gain in-game score. After a certain threshold and certain additional tasks, they will earn a NFT minted from Solana Blockchain. Players can also earn Social Sustainable NFT if they engage in the forum as well.

After completing all the tasks, they will be granted the Coach’s NFT which will be a tokenized certificate of completion.

## Our projection

# Summary & Conclusions

And finally… don’t forget that Word can help to check your spelling (and grammar!)

Maintaining lists of research references that can be reused when writing journal articles can be a real pain, especially when citation styles vary so much from journal to journal. When you have time I suggest you look at reference managers (e.g. JabRef for BibTeX, or websites such as CiteSeer), as well as other document creation options (e.g. LyX, LateX and OpenOffice.)

Good Luck.