CSE 591 (ADAPTIVE WEB) FINAL PROJECT: SOCIAL OGMENTED

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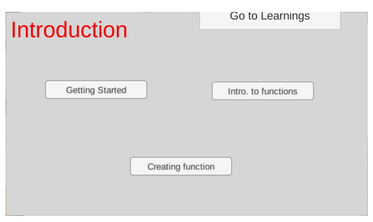
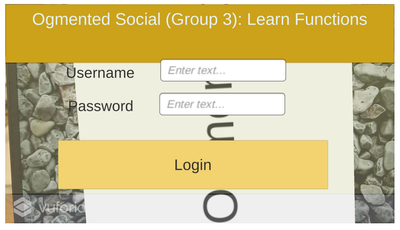
INTRODUCTION

- We have implemented a social puzzle that helps users learn various basic programming concepts.
- User can interact with the system using a handful of simple commands to traverse through a tree, linked list and virtually every possible data structure. Additionally it teaches the users different types of functions creation.
- With it's beautiful graphics and user-driven interactive system, our system helps its users develop logic which is vital for programming.
- Users can rate the difficulty of a level so that when other users use the system, they can get hints if they are stuck on a level.

MOTIVATION





- The motivation for this project came from the fact that logic is the most important part for anyone who wants to learn computer science
- Having a sound understanding of data structures and functions helps a student become a good programmer
- However, most students are afraid of programming and coding abilities because they think it's too difficult and complicated
- By using our system, we are trying to help them understand that programming can be fun and that it's not that complicated
- We believe that an interactive system that teaches users the basic building blocks of computer science will help students to learn in a fun way in their own free time

METHODOLOGY

- In order to solve the puzzle, user is provided with simple commands that he can use in combination with any of the remaining commands in order to create loops, recursion and new functions
- Based on the performance of the user for a particular level, we have shown his performance against the other users for that particular level through visualization
- If at some point, user gets stuck on a level i.e. if he fails the level a specific number of times (as determined by threshold number for that level), he gets recommendations based on other users on how to solve that level
- We are using collaborative filtering to show these hints to the user. We are also making use of content based filtering in order to compare the user to the rest of the users of the system and to determine the highest scorer for any level
- The ranking of a user is determined by the following formula:

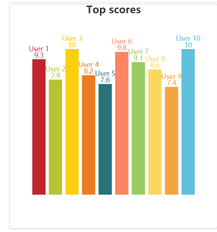
$$\sum_{i=0}^{number\ of\ levels} \frac{number\ of\ attempts\ to\ succeed}{total\ number\ of\ attempts * (optimal\ number\ of\ attempts - user's\ optimal\ attempt - 1)}$$

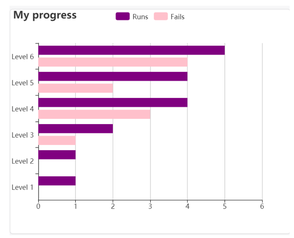
HOW DID WE DESIGN AN OPEN (SOCIAL) USER MODEL?	How the user data is collected (transparency), how the user is supposed to interact with the system(controllability) and the visualization of the data will be shown on separate pages.
HOW ARE WE TAKING EXPLICIT AND IMPLICIT USER FEEDBACK?	Explicit feedback about the user is taken when the user provides his information on the login page whereas the implicit information of the user is taken by the way he interacts with the system.
WHAT IS THE CONTENT?	The content of the system is the number of attempts it takes user to solve the level, the number of times the user has failed and the difficulty of the level.
WHAT ARE WE DOING TO DECOMPOSE THE CONTENT?	The content is decomposed based on the number of attempts taken by user to succeed the level, similarity measures such as cosine similarity. The content is presented to the user using collaborative filtering.
HOW ARE WE STRUCTURING THE CONTENT?	The structuring is based on the previous interaction of the user with the system. The system suggests the areas that the user should look up so he can improve in that area.

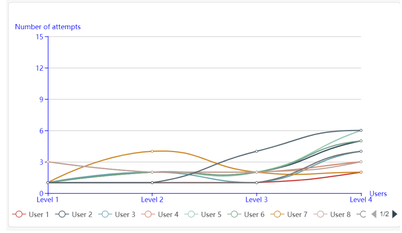
THE SYSTEM

	username	survey_question_cat1	survey_question_cat2	survey_question_cat3	survey_question_cat4	level1_score	level2_score	level3_score
0	abc	2	1	1	1	0.388889	0.111111	0.250000
1	cde	1	1	0	0	0.208333	0.142857	0.100000
2	efg	1	0	0	0	0.259259	0.160000	0.171429
3	xyz	2	2	2	1	0.250000	0.571429	0.750000
4	hij	1	0	0	0	0.150000	0.125000	0.155556

User Ranking Model







CONCLUSION

- Open user model was implemented in this model using the data collected as a result of user's action to solve the particular level.
- The visualizations help the user understand the skillsets he needs to improve in addition to where he stands amongst other users.
- In the developed application the user will be able to chat with other participants in real time in order to achieve higher level of competitive learning.
- In the current version of the system, user can learn various functions and data structures in a fun way. However, future applications of this systems are not only limited to these areas and we can expand them in other areas of object oriented programming as well as for non-programming domains.