

CSCI 1101 COMPUTER SCIENCE II

LIST OF SUGGESTED TOPICS FOR THE PROJECT

1. Title: Maze Robot

Description: Construct a simulation of a robot in a maze. The maze should be comprised of arbitrary line segments arranged within a square. The robot may be programmed or accept user commands.

Notes: The tricky bit in this is insuring the robot cannot pass through walls. It also lends itself well to OOP.

2. Shared Expense Tracker

Roommates typically share costs on many different things, such as bills, groceries, delivery pizza, etc. Implement a program that will track how much money a person has spent and what they have spent it on, and calculates how much money each person owes the others. In addition, you could:

- specify a subset of people the cost was shared with (maybe Bill didn't get any pizza this week...)
- keep track of the category an item is in ("Bill", "Grocery", etc.);
- provide reporting functionality that will let a person analyze their expenses ("how much did I spend on groceries last month?")

Try to think of things that would be useful to you personally.

3. Library Management System

This project is aimed at developing an online Library Management System (LiMS) for a library. This system can be used to search for books/magazines, reserve books, find out who is having a particular book, put in requests to buy a new book etc. It can contain both the user component and the librarian component. The system will check the enrolled person's name and unique ID, before issuing the book.

4. Simulation of an automated teller machine

This should involve all the components of a regular ATM: the user, the keypad, the bank account information, etc.

5. Gas Tracker

Implement a system that is able to keep track of gas usage for automobiles.

The system should be able to have multiple cars. A user should be able to enter gas receipt information into the system. The receipt should contain the date of fueling, the cost, the amount of gas (in Litres) purchased, the distance traveled since last fill up, and the car for which the gas was purchased. Based on this, have the system produce a variety of statistics on gas usage including fuel economy (L/100km), average driving distance per unit of time (day/week/month), average amount spent on gas, variations in gas price

over time and so on. Also, allow viewing of averages over all vehicles in the system (or subsets).

6. Online Quiz

Create an online quiz which initially asks the level of student, and then throws questions for that level. After every preset limit it checks for the previous five questions or so, and based on that changes the level.

7. Text based adventure role-playing game

A player would read some text and be able to make decisions and it would allow the player to customize the adventure. A neat twist would be to add "mistakes" or "errors" so that if a player chooses some combination (not just a singular event) then they will die, or their adventure is over and the game should backtrack the first choice which attributed to the mistake.

8. Wheel of Fortune Simulator for x players

A random phrase (which belongs to a 'category') is chosen and players can roll a wheel of (20-25) different outcomes and score or lose points based on their guesses of letters. Each player object spins the wheel - can guess a letter or buy a vowel - and then get's a chance to guess the whole puzzle. Rules can be found here:

[http://en.wikipedia.org/wiki/Wheel_of_Fortune_\(US_game_show\)#Spinning_the_Wheel](http://en.wikipedia.org/wiki/Wheel_of_Fortune_(US_game_show)#Spinning_the_Wheel)

9. One-player Battleship Game

On an 8 x 8 grid allow a player to choose locations for 3 boat objects (one of length 2, one of length 3, one of length 4) and have the computer randomly do the same thing (make sure they all fit on the grid). Alternate turns between the human player and the computer and when a battleship is sunk print "You Sunk my Battleship!" - the game is over when all three of one players ships are sunk. The computer could just use the Math.rand function to guess a place to attack but you can also make it smarter by keeping an array of points where it scored a hit and then adding to that. More information here: [http://en.wikipedia.org/wiki/Battleship_\(game\)](http://en.wikipedia.org/wiki/Battleship_(game))

10. Framework for any card game system, implement one actual game

Implement the basic classes and methods required for any card game (a deck object, shuffling, dealing, card values, players, hands) and then extend this to handle the rules of one game (e.g. blackjack)

11. A gaming program with multiple players

Create a Tron game for up to two players with easy, medium and hard AI opponents.

12. Healthy Lifestyle Management System

The objective would be to create a healthy lifestyle management program where a user could track daily details about their exercise and food choices. A user can add food items which they have eaten which have calories associated with them, fat grams, vitamins, etc.

In addition a user could add exercise so that it allows the user to consume more calories than usual. It should produce a daily, weekly and monthly report.

13. Video Store Rental System

Handle renting of videos, return due dates, searching for by type of video, managing customer accounts, reports on most popular movies

14. Cryptography

For those interested in cryptography implement the Caesar cipher coder/decoder and a Vigenere coder/decoder - A coder receives a plaintext message and encrypts it into a CodedMessage object and a key object - these objects can be passed to a Caesar decoder object and it will spew out the original plaintext.

http://en.wikipedia.org/wiki/Caesar_cipher

http://en.wikipedia.org/wiki/Vigen%C3%A8re_cipher

Extension: This could be expanded for a larger group by making an instant messaging program that encrypts messages before sending them, and decrypts them automatically on arrival. This doesn't have to be too complicated -- the user can provide an IP address to connect to and a password to use as an encryption key, which the other person must have as well. Sun.com has a good tutorial that provides a simple networking class, and I could also give a short tutorial on it if a group was interested.

15. Online Book Store /Grocery Store

Similar functionality as Amazon.com. Along with the search functionality, it tracks the purchases and views made by various users and depending on this data it should produce a report of the types of "recommendations" it should make. This could be for any product, such as grocery items, where a grocery store tracks their items bought over a month or two and then can produce a semi-accurate custom grocery list and recommendations.