DS - PROJECT

MONOPOLY

AND

FORMULA LAYOUT

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Problem statement

Monopoly is a board game that originated in the United States in 1903 as a way to demonstrate the evils of land ownership. The current version was published by Parker Brothers in 1935. Subtitled "The Fast-Dealing Property Trading Game", the game is named after the economic concept of monopoly—the domination of a market by a single entity. Aim of this project is to successfully make a playable model of the “Monopoly” using data structures. Data file handling will also be used to store the information for various properties and utilities.

List of data structures used :-

- Linked lists
- Arrays

Description about the important core functions used

DATA ( ) –

This function copies data of various properties from file to structures.
It reads data from mdata.txt file by function fscanf ( ) and using for loop it inputs all the data of property name , value , rent of properties with and without houses, its mortage value, and its coordinates on the board into a structure names data using array named ss.

DICE ( ) –

This is the most important function of the game .It control how the player token moves in the board. And also controls the go to jail function. The position coordinates of the active player and the player number is passed as variables in this function. Two random numbers are generated using rand ( ) function and their sum is the value that the player's token moves. This function changes the value in array A[ ][ ] with current position of player to 0 and makes value equal to player number in new position coordinates of the player in the array.
If both of the players are on the same property, it makes value equal to player number of other player in current position of array A[ ][ ] instead of 0 and then moves to the new coordinates.
When player passes the starting point coordinate this function adds $200 to the player's balance and when player passes jail coordinate it deduct $50 from his/her balance.

Also when player lands on community chest or on chances block on the board , function calls the respective function of hem .This function further calls two functions named diceprint ( ) and printing ( ).

PRINTING ( ) –

This function is used to print the player's tokens and information of properties on which they land. The main board of the monopoly is also printed by this function.
The player number is passed as variable in this function. By the help of readimage ( ) function it prints the monopoly board on the screen. And then its asks the user to enter choice by a menu driven program which asks to throw dice, view properties, setup houses, mortage , unmortise or sell our properties and exit.
Then it prints the available balance of both players and also the token of both players according to the present coordinates of them on the board which were previously saved in the array named A[ ][ ]. Also when both players are on the same properties, it makes token become one single token to avoid confusion and makes value of array 3 for the current coordinates of the player.

HOUSEPRINT ( ) -

This function prints all the houses setup by various players on the board.
The starting pointer of linked list in which the properties bought by the active player are saved in passed as variable to it.
Temp the temporary pointer traverses the whole linked list and checks the number of houses in the noah named variable in it and accordingly prints the houses on those blocks of the board where the noah value is non-zero.

BUYING ( )-

This function is used to buy properties on which the player lands.
The player coordinates and player number is passed as variables in this function .
All the information of the property is added as a node in the linked list which is bought by the player.

DICEPRINT ( ) –

This function is used to print the random numbers generated by the dice function is form dices.
The random numbers generated by dice ( ) function are passed as variables in this function. This function matches the values of numbers on dice and prints images of the dice faces which corresponds to those numbers. It further calls houseprint ( ) function.

POS ( ) –

This function prints the property information whenever the player lands on a property.
In this function player's coordinates are passed and the function matches those coordinates with the coordinates saved in structure named property and prints all the information saved in that structure of the that property which are name , rent , value , rent with different number of houses and mortage value of the property.

MORTAGE ( ) –

This function is used to mortage or sell houses or sell a particular property and is used when player is in shortage of money. A player can view the various properties he has and then select a particular property and remove houses/mortage it.This function accesses the main file pointer of the player and removes a particular node if the player has to remove it.

CHANCES ( )-

This function is used when a player lands on the chance option on the board.
The player has to do one of the 8 things that appear on the card which is selected by generating a random number and accordingly doing the task written on that card which are as follows-

- Advance to Go (Collect $200)
- Advance to Trafalagur Square
- Advance to Paul mall
- Go Back 3 Spaces
- Go to Jail
- Pay poor tax of $15
- You have won a crossword competition - Collect $100
- Your building loan matures – Collect $150

COMMUNITY ( ) -

This function is used when a player lands on the community chest option on the board.
The player has to do one of the 10 things that appear on the card which is selected by generating a random number and accordingly doing the task written on that card which are as follows-

- You inherit $100
- Advance to Go (Collect $200)
- Bank error in your favour Collect $200
- Doctor's fees Pay $50
- Go to Jail
- Holiday Fund matures collect $100
- Income tax refund Collect $20
- Life insurance matures Collect $100
- Pay hospital fees of $100
- Pay school fees of $150