OOP Project Documentation

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Working:

Movement Classes:

The project consist of classes for movements for every movement i.e. upmove , downmove , leftmove , rightmove .These classes have protected member functions which take an array of 4 by 4 which is map of game , and through loops the numbers in the game are shifted from one index to another by incrementing or decrementing the indexes and increment scores**(static int)**also if the same numbers are added.

ShowMap Class:

The ShowMap game has protected member function named display which takes the same array of map and modifies in into a map shape. ASCII values for the bordering of the maps are used for drawing the map and and the array values are operated in between these borders and shapes. The map is centered through tabs and new line characters.

CheckGoal Class:

This class has two public members functions, check and checkover .The check functions takes in two arrays , one is map and other is a template array. This function uses loops which compare them to check if there is any empty space in the map or not. If there is empty space , a new number is added in the map at random index. The checkover functions takes array(map) and checks through loops if the indexes are filled or not , if they are filled it means game is over.

Gameplay Class(Child Class):

This class is a child class of all the classes discussed above. This class inherits them publicly and assembles all the functions in it to play the game. Using Composition CheckGoal instance is created which will be used to check the empty spaces.This class has a public addblock function in which srand(library function) function is used to give random indexes and at those random index 2 or 4 is allotted. After that another function named play is defined which map array and temp array is declared having zero values at all indexes. To initialize the game srand function is used to obtain random index values for map and initially 2 2 values are given at that index. An integer ch is declared to take input from the user for movements. Ascii values for arrow keys are used . if user presses up arrow , it will invoke the upmove function from Class Upmove and the map array declared above will be passed to it. Similarly other movement functions will be invoked accordingly.The instance created through composition will call check and checkover function through dot operator . if check functions returns 0 (false) which means there is an empty space available in the map so addblock function will be invoked to add 2 or 4 in the map. If checkover function returns false it means there is no empty space and the game will be Over. A constructor at the end is created which invokes the play function of same the class. And finally in main function Class instance is created which runs the game.