Project work

Faculty of technical science Novi Sad

Department:	Applied Software Engineering
Course:	Computer architecture
Topic:	Chesspernado

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1. About the game

Chesspernado is an original game made by Danilo Novakovic inspired by chess, tetris and plants vs zombie idea.
The game is Player vs AI, played on a 12x8 board. Players goal is to protect the first row as long as possible
from the attacking enemy pieces. Player starts with 3 knights and 2 bishops, and is able to upgrade and buy
more from the shop as the game progresses.

2. Realization

Program is realized in C programming language via standard C libraries. Graphic enviroment is Terminal. This was made possible with command „tput reset“ which resets the Terminal. Whenever matrix, for example, is soppoust to be printed out, terminal is reset just a moment before. It happens so fast that, to human eye, it seems like terminal is standing in place.

Some of the ANSII color codes are:

- [0m resets all color/format styles (to white on black board)
- [1m **bold** (also interpreted as „high intensity“ colors
- [4 <u>underline </u>on
- [30m do [39m are colors: black, red, green, yellow, blue, purple, cyan, white (in that order) (change color of the text)
- similary [40m do [49m (in same order) change background color

When called from .c file, a prefix \x1b should be added (ex. \x1b[30m)

2.1. Compiling

Linux: Open terminal, navigate to directory containing the source files and then execute the following command: „*make*“

Once you compile program succesfully you run it by typing: ./chesspernado

3. Rules

COMMANDS SUPPORTED:

/back - Goes back to the main menu.
/random - only at init_setup (beginning stage). Generates 3 knights and 2 bishops on random positions.
/exit, /end - exits the program
/undo - undoes previous move. Can be used from start to finish of the CURRENT wave. Once the wave completes undo history
is deleted!
/help - prints Chesspernado Manual whenever you want during the game
/skip - skips 1 move during wave.
/revive - you can sacrifice 60 points to revive dead piece (you can set him anywhere from 1 to 5th row)
/buy - summons SHOP window, from which you can buy certain pieces and features for X points

Notation of the moves is as follows:
Piece/column/row/column/row (what piece do you want to move, from where, to where)
examples: Bf4d6, Nb8c6 etc.

PIECE & MOVEMENT IN CHESSPERNADO:

- SUICIDE ROOK (R): Is a special piece that lasts for ONE MOVE ONLY. He first waits for player /other pieces to make a move, and then

sprints forward [i+k][j] until he hits ANYTHING (either end of the board, enemy or the player). Once he collides with an object
he will then explode, killing both himself and that object (either player or enemy). User can buy this piece in the shop
as many times as he likes as long as he has points for it, and he can place as many as the suicide rooks he likes.
If there are multiply suicide rooks on the boardthe priority will have those in front.

- HAPPY KING (K): Is a special piece that lasts until destroyed.
Happy King is so happy that he won't hurth a fly, meaning that
he cannot kill other enemy pieces. He shares his love of life
with player, and generates 1 point each turn.
Happy king can't be moved.
User can buy this piece from the shop, and it is generated on random positions anywhere from 1st row to 5th, on any column.

- BISHOP (B): can move any number of squares diagonally, but cannot leap over other pieces.

- AI_BISHOP (b): has rules of regular bishop but will only move in following manner. BISHOP AI always "wakes up on the left foot" meaning that he will prioritize moving as far to the bottom-left as he can above all. Only if he is unable to move to the left anymore
will he swap directions meaning he will move as far to the bottom-right as he can. AI_BISHOP will only eat enemy piece if it is caught in this LEFT-RIGHT pattern. (AI_BISHOP is worth 12 points)

- KNIGHT (N): The knight moves to any of the closest squares that are not on the same rank, file, or diagonal, thus the move forms an "L"-shape:
two squares vertically and one square horizontally, or two squares horizontally and one square vertically.
The knight is the only piece that can leap over other pieces.

- AI_PAWN (p) : The pawn can move forward to the unoccupied square immediately in front of it on the same file, or on its first

move it can advance two squares along the same file, provided both squares are unoccupied;
or the pawn can capture an opponent's piece on a square diagonally in front of it on an adjacent file, by moving to that square.
The AI_PAWN will prioritize eating enemy piece over going forward.
(AI_PAWN is worth 6 points)

GOAL OF THE GAME & PHASES

- The goal of the game is to stop enemy pawns & bishops from reaching to 1st row of the board.
- If board is FULL on AI's turn, then the game will end.
- If player lost ALL OF HIS PIECES then the game will end.
- At the end of the game player will be prompted to enter the name, afther what the result will be printed out in the scoreboard.txt

NOTE: Score won't be recorded if the program has been closed with /exit command

PHASES:

I) Initial setup
At the beginning of the game player decides places 3 knights and 2 bishops on any column from 1st to 5th row of the board.
during this phase player can use :

    /end, /exit - exit the game
    /re - resets the initialization setup
    /random - generates bishops and knights on random positions.

Upon completion player will be prompted to confirm the setup.

II) Waves:
After initial setup, the game beginns, and randomly generated waves beginn. Each wave gets harder and harder as the game goes on.

TURNS:
PLAYER: Player is able to move 1 piece during his turn (with exeption of shop).

ENEMY_AI: During 1 turn EVERY piece with legal moves will be move. If NO PIECE has ANY LEGAL MOVE then N new pawns will be randomly summoned anywhere from 12 to 7th row.

4. Copyrights

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