PYTHON PROJECT
TEAM 34
SNAKE AND LADDER GAME (GUI BASED)

Basic Introduction:

Snakes and Ladders is an ancient Indian board game regarded today as a worldwide classic. It is played between two or more players on a gameboard having numbered, gridded squares. A number of "ladders" and "snakes" are showcased on the board, each connecting two distinct board squares. The objective of the game is to navigate one's game piece, according to die rolls, from the start (bottom square) to the finish (top square), helped or hindered by ladders and snakes, respectively.

The game is a comprehensible race based on sheer luck. The size of the grid varies, as does the exact arrangement of the snakes and ladders, with both factors affecting the duration of play. Each player is represented by a distinctly coloured game piece token. A single die is rolled to determine random movement of a player's token in the traditional form of play.

User Requirements:

1) Knowledge of the rules of the game.
2) Basic knowledge as to how one should use the computer and the peripheral devices and also how to run softwares.
3) Python and Pygame need to be installed in the PC.
4) Approximately, 25MBs of hard disk space so as to store the project folder named “Snake and Ladder game”.

External Packages Used:

1) Tkinter: This is a standard GUI library for Python. Python when combined with Tkinter provides a swift and facile way to create GUI applications. It provides a powerful object-oriented interface to the Tk GUI toolkit.

2) pygame: Pygame is a Python wrapper module for the SDL (Simple DirectMedia Layer software) multimedia library which contains python functions and classes that will allow you to use SDL's support for playing cdroms, audio and video output, and keyboard, mouse and joystick input.

3) random: A built-in module that you can use to make random numbers.

4) time: This handles time-related tasks.

5) os: This module provides a portable way of interacting with operating system dependent functionalities.

6) cx_freeze: This is a set of scripts and modules for freezing Python scripts into executables.

Catalogue of Basic Concepts Used in Codes:

1) **dictionary**
2) **list**
3) Generating **random** number
4) Selecting a **random** value from a **list**
5) Adding wait/**sleep** in program
6) Conditional Statements i.e. **if** and **else**
7) Getting input from user

Game Description:

Snakes and Ladders (2D GUI based game) project file contains python scripts (snakesladders.py) and other .jpg, .png and .wav files. Talking about the gameplay and standard rules, it’s all same as the real one. The user can select whether to play multiplayer or with the computer. After starting the game, the player has to roll the dice (the dice that appears on the screen, not a physical one) and after rolling it the game moves the token automatically according to the dice number. There are number of ladders and snakes that will apear on the screen. They will helps the player to upgrade or downgrade the square number drastically. The player who reaches the 100th square of the track is the winner.

Design and Algorithms:

Until one of the players' token reaches the 100th square mark, following tasks keep occuring, as per requirement of the situation:

> Roll the dice
  - Here, the random function helps in generating random numbers which are actually the numbers that are shown on the dice.

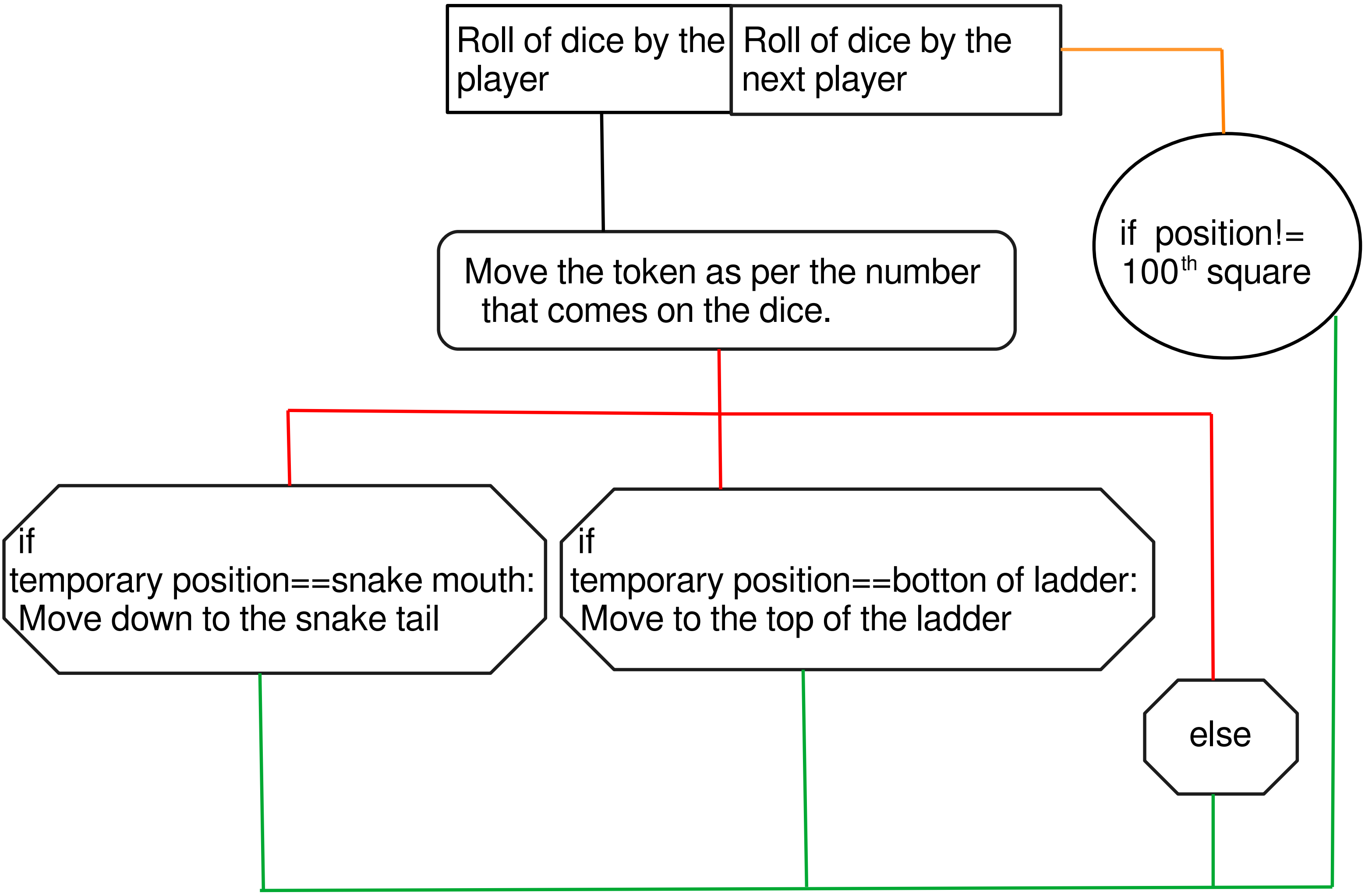
> Move the player forward for the value got on dice roll.

> IF the temporary location of the player is at snake's head, move down the player's token to the square to which the tail points. That is now his permanent location and its time for the next player to roll the dice.

> IF the temporary location of the player is at ladder's bottom, move up the player's token to the square at the top of the ladder. That is now his permanent location and its time for the next player to roll the dice.

> ELSE, make the temporary location of the presently playing player as permanent and let the next player rolls the dice.

The above algorithm is braced by images and sounds in order to make the game user friendly.


Roll of dice by the player
Roll of dice by the next player
if position!= 100th square
Move the token as per the number that comes on the dice.
if temporary position==snake mouth: Move down to the snake tail
if temporary position==botton of ladder: Move to the top of the ladder
else

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