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Yeshwantrao Chavan College of Engineering

Computer Technology

Sem-7, Sec-A

AI Game Designing Assignment (CT2401)

**Snake and Ladder**

**A close-up of some toys

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| **Aim**: To design a game (Snake and Ladder). |
| **Working**:  This Snake and Ladder code is written in Python. It uses a python Tkinter module to create the GUI.  **Tkinter**  Tkinter is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.  Creating a GUI application using Tkinter is an easy task. All you need to do is perform the following steps −  Import the Tkinter module.   1. Create the GUI application main window. 2. Add one or more of the above-mentioned widgets to the GUI application. 3. Enter the main event loop to take action against each event triggered by the user.   Example  #!/usr/bin/python  import Tkinter  top = Tkinter.Tk()  # Code to add widgets will go here...  top.mainloop()  This would create the following window −  TK Window  **About**  Table  Description automatically generated  1. Widgets used in this game: Button, Label, messagebox,  2. There are 2 players named Player1 and Player2 represented by pink and yellow colors respectively.  3. The grid is of 10x10 cells.  4. Initial positions of players are [9,0].  5. Start position is [9,0], End position is [0,0].  6. There is one dice that gives a value from 1 to 6.  7. The players are moved automatically according to the number shown by dice.  8. User needs to press the dice button to roll the dice.  9. Snakes and Ladders are shown on the cell. The cell contains player’s new coordinates according to snake or ladder.  10. The game closes automatically when a player wins. |
| **Project Link:** <https://github.com/anshulhedau10/snakeandladder>  **Code:**  import tkinter.messagebox  import tkinter as tk  from time import sleep  from random import randint  Grid = []  for i in range(10):  GridRow = []  for j in range(10):  GridRow.append("Empty")  Grid.append(GridRow)  Grid[0][0] = "End"  Grid[9][0] = "Start"  #Snakes  Grid[0][3] = [2,1,"S"]  Grid[0][6] = [2,7,"S"]  Grid[2][6] = [5,2,"S"]  Grid[3][1] = [4,0,"S"]  Grid[3][5] = [5,6,"S"]  Grid[6][2] = [6,5,"S"]  #Ladders  Grid[2][0] = [0,0,"L"]  Grid[1][7] = [0,7,"L"]  Grid[2][4] = [1,5,"L"]  Grid[5][5] = [1,2,"L"]  Grid[7][2] = [5,0,"L"]  Grid[7][5] = [5,7,"L"]  #[Row,Collumn]  player1 = [9,0]  player2 = [9,0]  LabelGrid = []  root = tk.Tk()  def welcome\_msg():  msg = """  Welcome to Snake and Ladder Game  Version: 1.0.0  Rules:  1. Initally both the players are at START position [9,0].  2. Press the dice image button to roll the dice.  3. Players will move forward the number of spaces shown by the dice.  4. If you land at the bottom of a ladder, you will move up to the top of the ladder.  5. If you land on the head of a snake, you will slide down to the bottom of the snake.  6. The first player to get to the END position is the winner [0,0].  """  print(msg)  def updateGrid():  global p1, p2  global player1  global player2  global LabelGrid  global Grid    countodd = 100  counteven = 81  for ele in LabelGrid:  ele.grid\_forget()  for i in range(10):  root.grid\_rowconfigure(i,weight=1,minsize=64)  root.grid\_columnconfigure(i,weight=1,minsize=64)  for j in range(10):  #root.grid\_rowconfigure(i,weight=1,minsize=64)  #root.grid\_columnconfigure(j,weight=1,minsize=64)  Label = tk.Label(root)  Label.grid(column=j,row=i,sticky="nsew")  LabelGrid.append(Label)  if (i+j)%2 == 0:  Label.configure(bg="gray80")  if Grid[i][j] == "Empty":  if i%2==0:  Label.configure(text=str(countodd))  else:  Label.configure(text=str(counteven))    elif Grid[i][j] == "Start":  Label.configure(text="Start",bg="paleturquoise1")  elif Grid[i][j] == "End":  Label.configure(text="End",bg="peachpuff1")  else:  if Grid[i][j][2]=="S":  LabelText = "Snake🐍\n["+str(Grid[i][j][0])+","+str(Grid[i][j][1])+"]"  else:  LabelText = "Ladder🪜\n["+str(Grid[i][j][0])+","+str(Grid[i][j][1])+"]"  #LabelText = "Leads to\nCollumn "+str(Grid[i][j][1])+"\nRow "+str(Grid[i][j][0])  Label.configure(text=LabelText,bg="indianred1" if Grid[i][j][2] == "S" else "mediumspringgreen")  countodd-=1  if i%2==1:  if j==9:  counteven-=29  else:  counteven+=1  p1 = tk.Label(root,text="Player1",bg="Pink")  p1.grid(column=player1[1],row=player1[0],sticky="n")  LabelGrid.append(p1)  p2 = tk.Label(root,text="Player2",bg="Yellow")  p2.grid(column=player2[1],row=player2[0],sticky="s")  LabelGrid.append(p2)  root.update()  def movePlayer(player,spaces):  global Grid    endSpace = player  for i in range(spaces):  print(endSpace)  if endSpace == [0,0]:  return endSpace  if endSpace[0]%2 == 1:  if endSpace[1] == 9:  endSpace[0] -= 1  else:  endSpace[1] += 1  else:  if endSpace[1] == 0:  endSpace[0] -= 1  else:  endSpace[1] -= 1    if type(Grid[endSpace[0]][endSpace[1]]) == list :  return [Grid[endSpace[0]][endSpace[1]][0],Grid[endSpace[0]][endSpace[1]][1]]  return endSpace  def start():  welcome\_msg()  global player1, player2  dice = tk.PhotoImage(file="dice\_logo.png")  Turn = 1  Winner = ""  Text = tk.Label(root,text="Loading")  WaitVariable = tk.IntVar()  Button = tk.Button(root,image=dice,command=lambda: WaitVariable.set(1))  Text.grid(column=0,row=10,columnspan=10,sticky="nsew")  Button.grid(column=4,row=11,columnspan=2,sticky="nsew")  root.grid\_rowconfigure(10,weight=1,minsize=32)  root.grid\_rowconfigure(11,weight=1,minsize=32)  updateGrid()  while True:  Text.configure(text="Player "+("1" if Turn%2 ==1 else "2")+"'s turn")  Button.wait\_variable(WaitVariable)  roll = randint(1,6)  print(roll)  Text.configure(text="Rolled a "+str(roll))  if Turn%2 == 1:  player1\_old = player1[:]  player1 = movePlayer(player1,roll)  if player1 == [0,0]:  Winner = "Player 1"  break  else:  player2\_old = player2[:]  player2 = movePlayer(player2,roll)  if player2 == [0,0]:  Winner = "Player 2"  break  Turn += 1  updateGrid()  sleep(1)    Text.configure(text=Winner+" wins!")  sleep(5)    #updateGrid()  tkinter.messagebox.showinfo(message=str(Winner)+" wins!")  root.destroy()  exit()  root.title("Snake and Ladder v1.0.0")  root.iconphoto(False, tk.PhotoImage(file="photo.png"))  start()  root.mainloop() |
| **Screenshots:**  **Graphical user interface, text, application  Description automatically generated**  **Table  Description automatically generated**  **Diagram, table  Description automatically generated**  **Table  Description automatically generated**  **Diagram, table  Description automatically generated**  **A screenshot of a computer  Description automatically generated with medium confidence** |
| **Conclusion:**  Thus, we have designed a game in Python – Snake and Ladder. |