Yeshwantrao Chavan College of Engineering

Computer Technology

Sem-7, Sec-A

AI Game Designing Assignment (CT2401)

Snake and Ladder

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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.

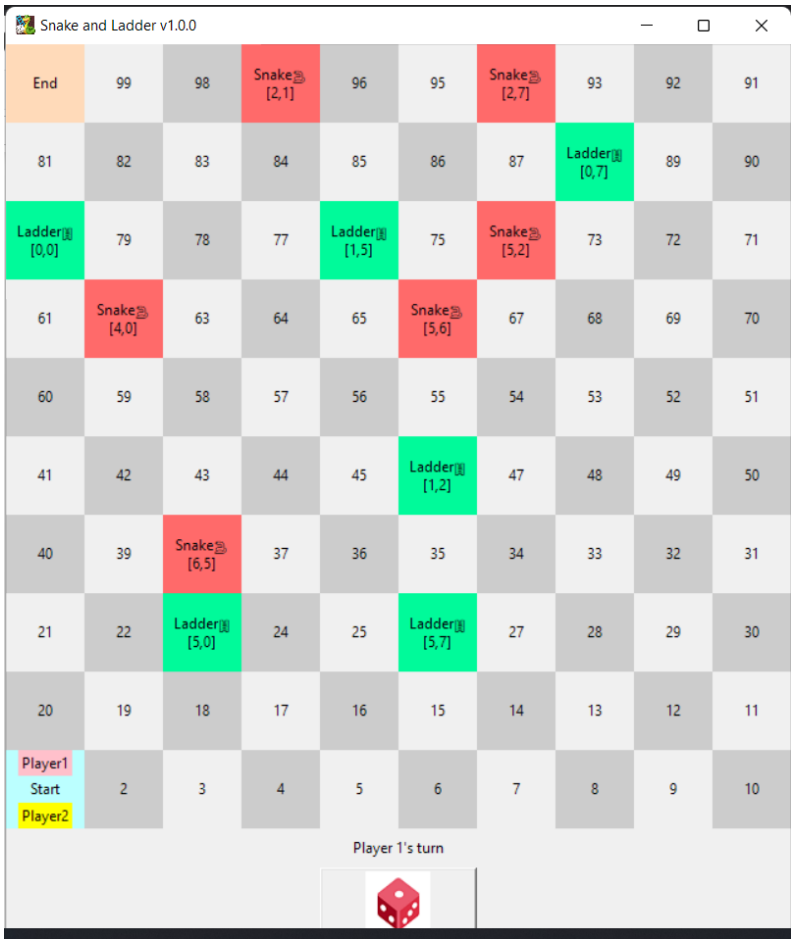
1. Create the GUI application main window.
2. Add one or more of the above-mentioned widgets to the GUI application.
3. Enter the main event loop to take action against each event triggered by the user.

Example

```
#!/usr/bin/python

import Tkinter
top = Tkinter.Tk()
# Code to add widgets will go here...
top.mainloop()
```

This would create the following window −

About



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")
```

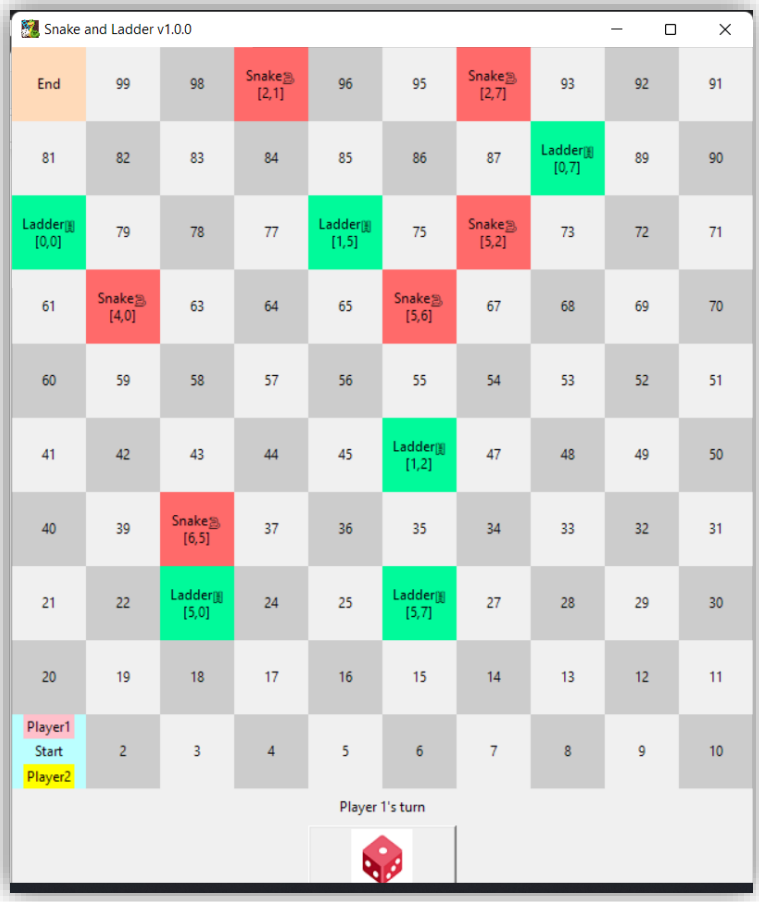
```
    root.grid_rowconfigure(10,weight=1,minsize=32)
    root.grid_rowconfigure(11,weight=1,minsize=32)

    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()
```

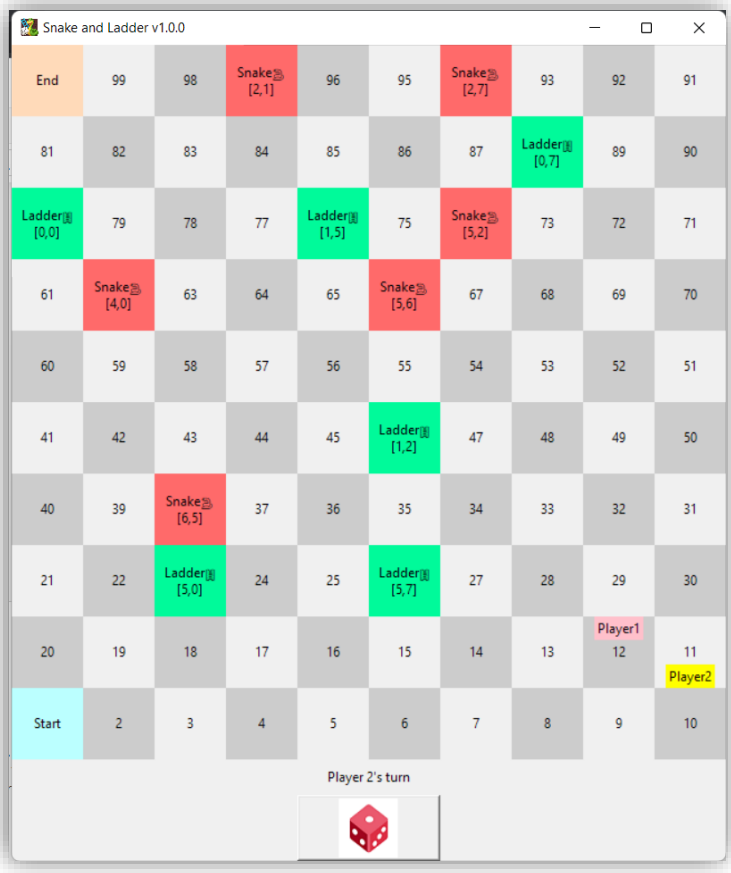
Screenshots:

```
176
177     #updateGrid()
178     tkinter.messagebox.showinfo(message=str(Winner)+" wins!")
179     root.destroy()
180     exit()
181
182
183
184 root.title("Snake and Ladder v1.0.0")
185 root.iconphoto(False, tk.PhotoImage(file="photo.png"))
186 start()
187 root.mainloop()
```

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].




Snake and Ladder v1.0.0
End
99
98
Snake [2,1]
96
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Snake [2,7]
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92
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83
84
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87
Ladder [0,7]
89
90
Ladder [0,0]
79
78
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Ladder [1,5]
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Snake [5,2]
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Snake [4,0]
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Snake [5,6]
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Ladder [1,2]
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Snake [6,5]
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Ladder [5,0]
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Ladder [5,7]
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Player1
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Player2
Start
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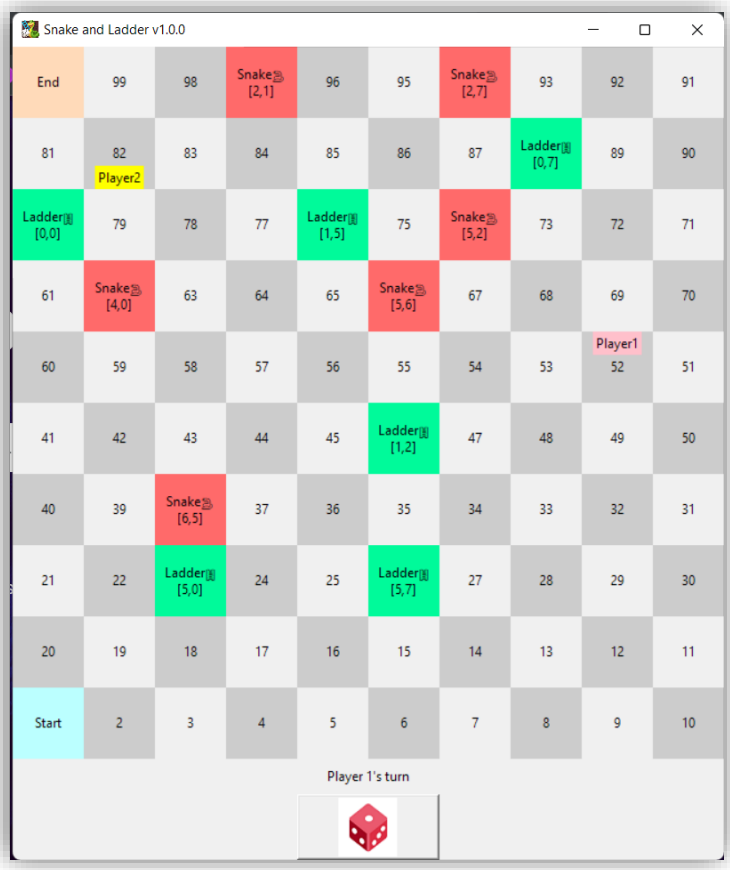
Player 2's turn


Snake and Ladder v1.0.0
End
99
98
Snake [2,1]
96
95
Snake [2,7]
93
92
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81
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Player2
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Ladder [0,7]
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Ladder [0,0]
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Ladder [1,5]
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Snake [5,2]
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Snake [4,0]
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Snake [5,6]
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Player1
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Ladder [1,2]
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Snake [6,5]
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Ladder [5,0]
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Ladder [5,7]
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11
Start
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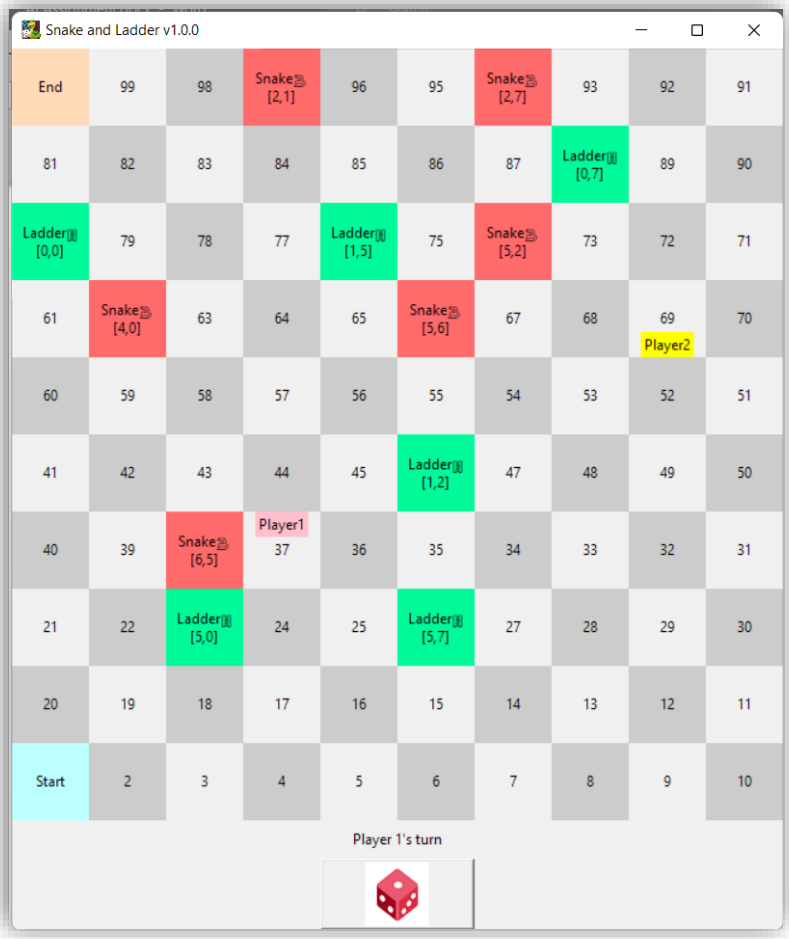
Player 1's turn


Snake and Ladder v1.0.0
End
99
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Snake [2,1]
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Snake [2,7]
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Ladder [0,7]
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Ladder [0,0]
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Ladder [1,5]
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Snake [5,2]
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Snake [4,0]
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Snake [5,6]
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Player2
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Ladder [1,2]
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Snake [6,5]
Player1
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Ladder [5,0]
24
25
Ladder [5,7]
27
28
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13
12
11
Start
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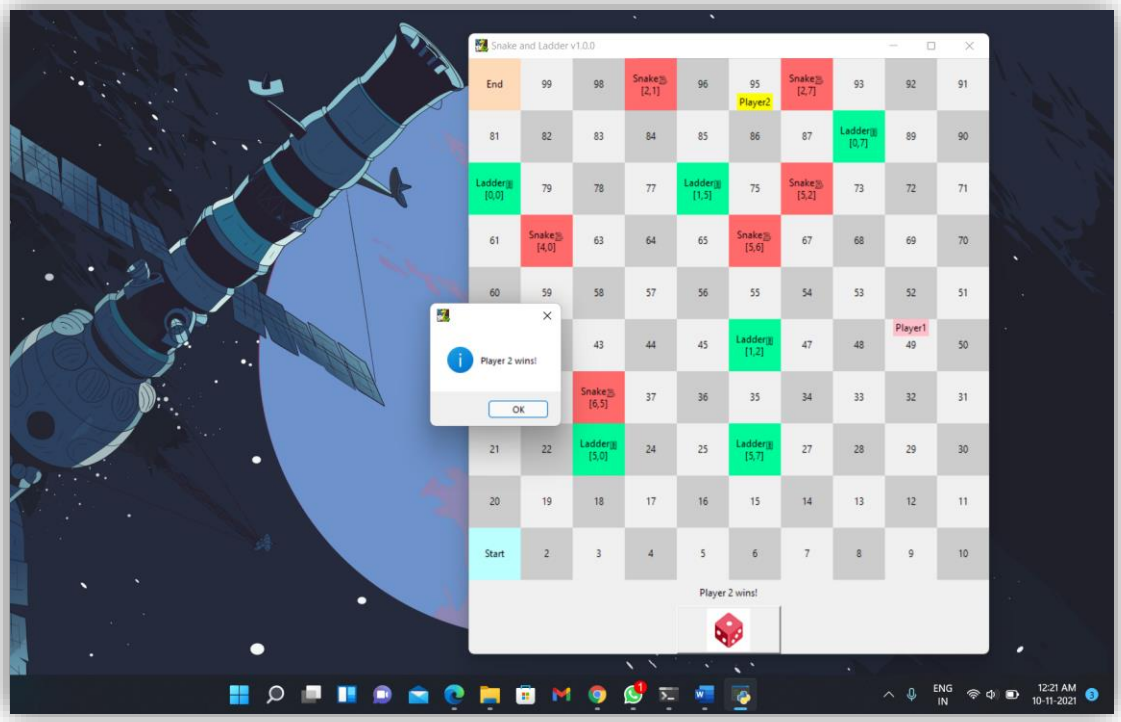
9
10
Player 1's turn


Player 2 wins!
OK
Player 2 wins!

Conclusion:
Thus, we have designed a game in Python – Snake and Ladder.