PROJECT REPORT

On

"Dice Roll Simulator"

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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CERTIFICATE

This is to certify that the Project titled **"Dice Roll Simulator"** is a bonafide work of **Soham Makrand Linge** carried out for the partial fulfillment of the requirement for the award of Degree of Bachelor of Engineering in **Computer Science & Engineering.**

Mr. Ratnesh K. Choudhary   **Mr. Animesh Tayal**

Assistant Professor   Head of Department

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CHAPTER 1
INTRODUCTION

1.1 PROJECT BACKGROUND

Dice, singular die, small objects (polyhedrons) used as implements for gambling and the playing of social games. The most common form of die is the cube, with each side marked with from one to six small dots (spots). The spots are arranged in conventional patterns and placed so that spots on opposite sides always add up to seven: one and six, two and five, three and four. There are, however, many dice with differing arrangements of spots or other face designs, such as poker dice and crown and anchor dice, and many other shapes of dice with 4, 5, 7, 8, 10, 12, 16, and 20 or more sides. Dice are generally used to generate a random outcome (most often a number or a combination of numbers) in which the physical design and quantity of the dice thrown determine the mathematical probabilities.

1.2 PROBLEM STATEMENT

If you are concerned about using small dice at your table or are having difficulty using dice, here are some alternative options that you can use to help keep randomization in your tabletop games!. For playing online games there are basic games which require dice roll such as snake games, Ludo, monopoly .The basic problems arrived at rolling a dice manually is probability of getting each no or fair roll .therefore there is a possibility of non-fair game by get similar numbers repeatedly.

1.3 ABOUT PROJECT

The dice is a simple cube that generates any number from 1 to 6, and the dice simulator is a computer model that rolls the dice for the user. A dice rolling simulator can be implemented in different ways by Python. Six images will be required to create that will be used in the simulator. The Unicode of each dice is used to display any image in Python that is not installed by default. The dice rolling simulator can be implemented without GUI and GUI. The Dice is a simple cube shaped like object used in various board games such as snake- ladder, Ludo etc. It is a simple cube which generates a random number when rolled by a user. A Dice rolling simulator is nothing but a computer model that can be created by a software program and it functions same as a normal dice in which user rolls a dice and a random number gets shown on the screen. There are many ways a dice simulator can be implemented. In this paper, we will implement a GUI Application of dice simulator using Tkinter Framework in Python.

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CHAPTER 2

METHODOLOGY

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Everyone knows what a dice. It's a simple cube like structure which displays random number from 1 to 6 when rolled. So, the dice simulator is nothing but a computer model that can roll a dice for us. So, to create a dice game a GUI model should be applied which can show proper working or image of dice faces .therefore first of all Tkinter library is imported which create a platform for creating python code. Further, label line is create as a greeting to start a game with use of different fonts and colors, a button has been created to roll a dice when it is been clicked by same method. Whenever a button is place the dice face will be printed because of Unicode value image entered in python .because of random function random values of dice will be printed and because of switch function when a dice is been rolled the the text for each dice is also been printed. Example:- You rolled a one! Click roll dice to roll again.

We are going to use the random module in Python to imitate a dice roll. The random module comes preloaded in the Python programming language, making it simple to include into your code. After importing the random module, you have access to all of the module's functionalities. It's a large list, but we'll utilize the random.randint () method for our needs. Based on the start and end values, this method outputs a random number. This reasoning may be used to imitate a dice roll since the lowest value of a dice roll is 1 and the biggest is 6. This is what we'll use in our random.randint () method to get the start and finish numbers. Let's have a look at how to replicate a dice roll in Python:

2.1 System Architecture

<div align="center">
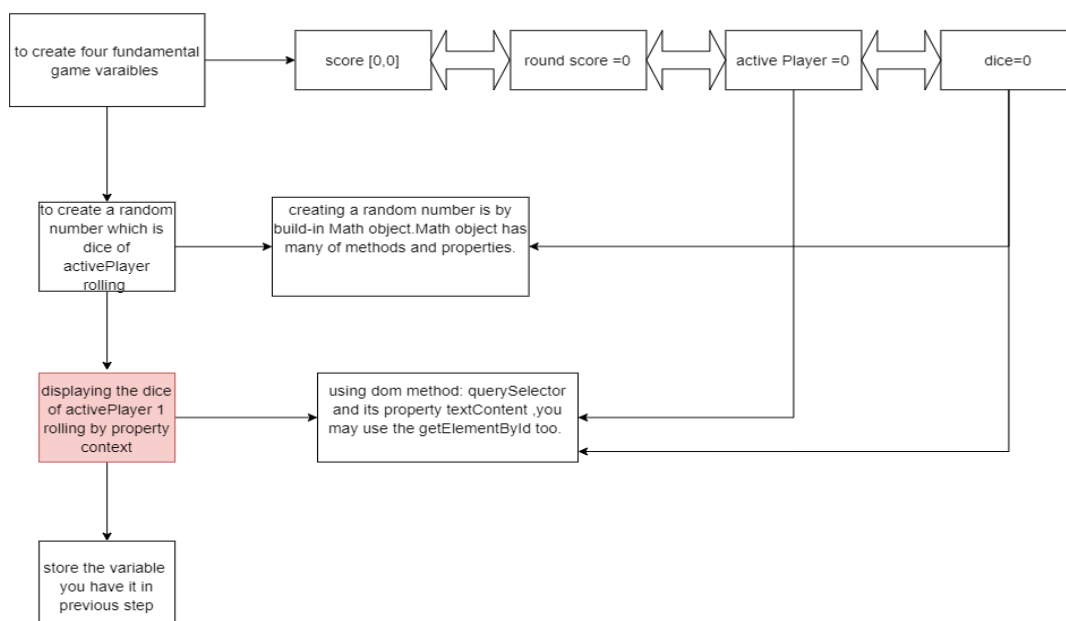
Fig 2.1.1 Working of Dice Roll

</div>

CHAPTER 3
TOOLS/PLATFORMS

4.1 SOFTWARE REQUIREMENT

a) **CLIENT-SIDE TECHNOLOGY:** Python3
b) **IDE / FRAMEWORK:** Visual Studio Code
c) **LIBRARIES:** tkinter, numpy
d) **OPERATING SYSTEM:** Windows 11

Python:

Python is a widely used general-purpose, high level programming language. It was created by Guido van Rossum in 1991 and further developed by the Python Software Foundation. It was designed with an emphasis on code readability, and its syntax allows programmers to express their concepts in fewer lines of code.

Visual Studio:

Introduction to Visual Studio Code. Visual Studio Code is a code editor in layman's terms. Visual Studio Code is "a free-editor that helps the programmer write code, helps in debugging and corrects the code using the intelli-sense method ". In normal terms, it facilitates users to write the code in an easy manner.

Tkinter:

Introduction to Visual Studio Code. Visual Studio Code is a code editor in layman's terms. Visual Studio Code is "a free-editor that helps the programmer write code, helps in debugging and corrects the code using the intelli-sense method ". In normal terms, it facilitates users to write the code in an easy manner. **Tkinter** is a Python binding to the Tk GUI toolkit. It is the standard Python interface to the Tk GUI toolkit,[1] and is Python's de facto standard GUI.[2] Tkinter is included with standard GNU/Linux, Microsoft Windows and macOS installs of Python.

Numpy:

NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

   *Random:*A random number in Python is any number between 0.0 to 1.0 generated with a pseudo-random number generator. It is possible to create integers, doubles, floats, and even longs using the pseudo-random generator in Python. Since it generates the numbers randomly, it is usually used in gaming and lottery applications.

Windows 11:

Windows 11 is the next client operating system, and includes features that organizations should know. Windows 11 is built on the same foundation as Windows 10. If you use Windows 10, then Windows 11 is a natural transition. It's an update to what you know, and what you're familiar with. Windows 11 is the latest major release of Microsoft's Windows NT operating system.

CHAPTER 4
DESIGN & IMPLEMENTATION

4.1 ALGORITHM

Step 1: Importing the required modules

We will import the following modules:

- Tkinter: Imported to use Tkinter and make GUI applications.
- Random: Imported to generate random numbers.

Step 2: Building a top-level widget to make the main window for our application

In this step, we will build the main window of our application, where the buttons, labels, and images will reside. We also give it a title by title() function.

Step 3: Designing the buttons

Now, just think, what we need to roll a die? Just our hands!

The below code will add a label giving a heading to our dice simulator. Also, we will add an image area, which will display the image chosen by random numbers.

Step 4: Forming a list of Unicode to be randomly displayed

Step 5: Constructing a label for image, adding a button and assigning functionality

Step 6: root.mainloop()' is used to close the main loop of random

4.2 FLOWCHART
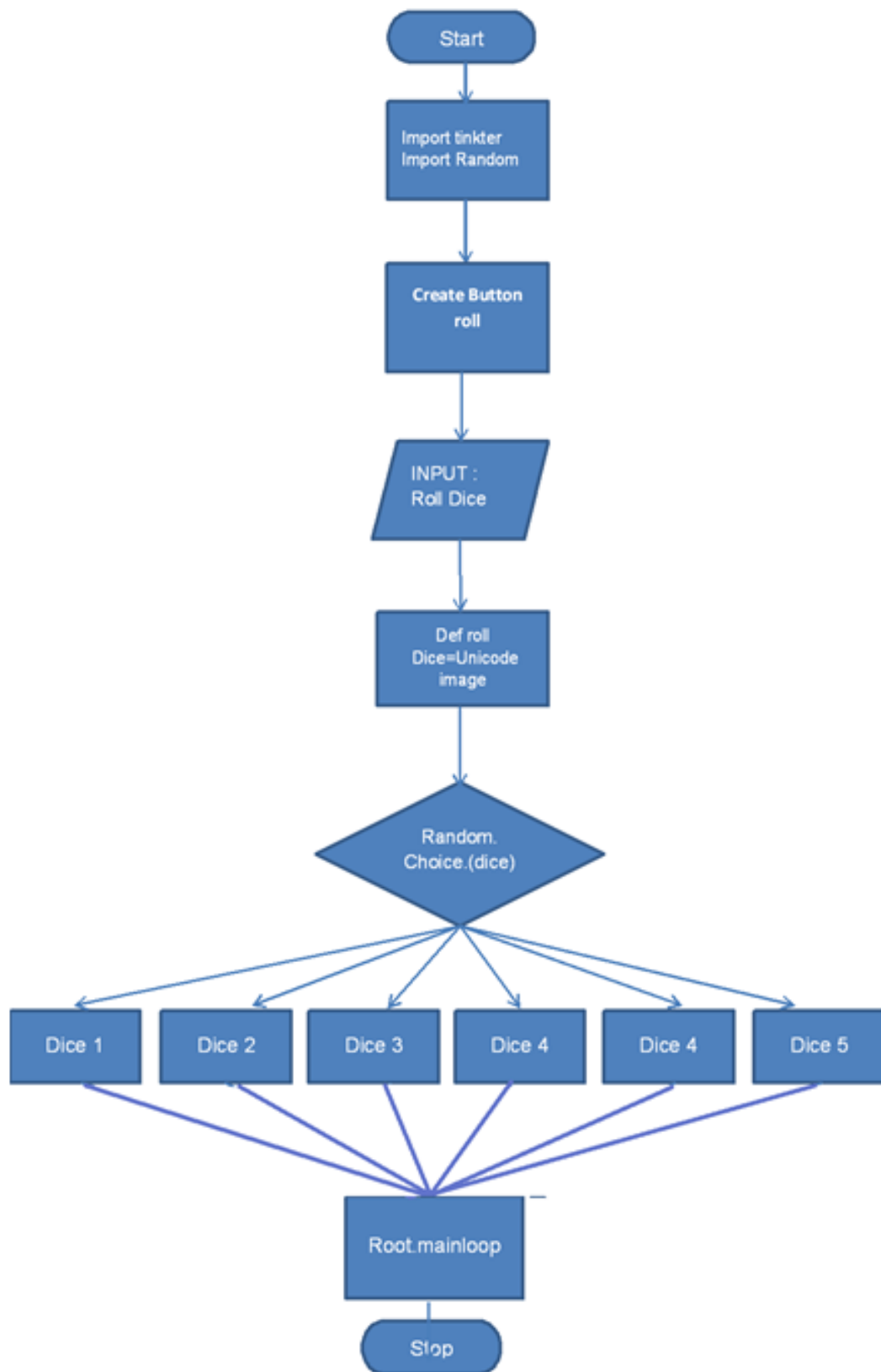
**Fig 4.2.1** Dice Roll Simulator

4.3 SOURCE CODE

```python
import random
import tkinter
root = tkinter.Tk()
root.geometry('600x600')
root.title('Welcome to Dice roll simulator')
#label to print result
label = tkinter.Label(root, text='', font=('Arial', 260))
l2      =      tkinter.Label(root,text="***************Welcome      to      Dice      Rolling
Game***************", foreground='#7D35D6',font=("Pristina",50, "bold"))
def roll_dice():
    value = ['\u2680', '\u2681', '\u2682', '\u2683', '\u2684', '\u2685']
    result=random.choice(value)
    label.configure(text=result ,justify='center')
    label.pack()
    if(result=='\u2680'):
        label3=tkinter.Label(root,text='You rolled a one! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
    elif(result=='\u2681'):
        label3=tkinter.Label(root,text='You rolled a two! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
    elif(result=='\u2682'):
        label3=tkinter.Label(root,text='You rolled a three! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
    elif(result=='\u2683'):
        label3=tkinter.Label(root,text='You rolled a four! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
    elif(result=='\u2684'):
        label3=tkinter.Label(root,text='You rolled a five! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
```

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```
    elif(result=='\u2685'):
        label3=tkinter.Label(root,text='You rolled a six! Click roll dice to roll again.',font=("Courier
        New",20))
        label3.place(x=150,y=450)
button = tkinter.Button(root, text='roll dice', foreground='Green', command=roll_dice,font=("Comic
Sans MS", 15, "bold"))
button.pack()
l2.pack()
root.mainloop()
```

CHAPTER 5
RESULT & DISCUSSION

5.1 OUTPUT
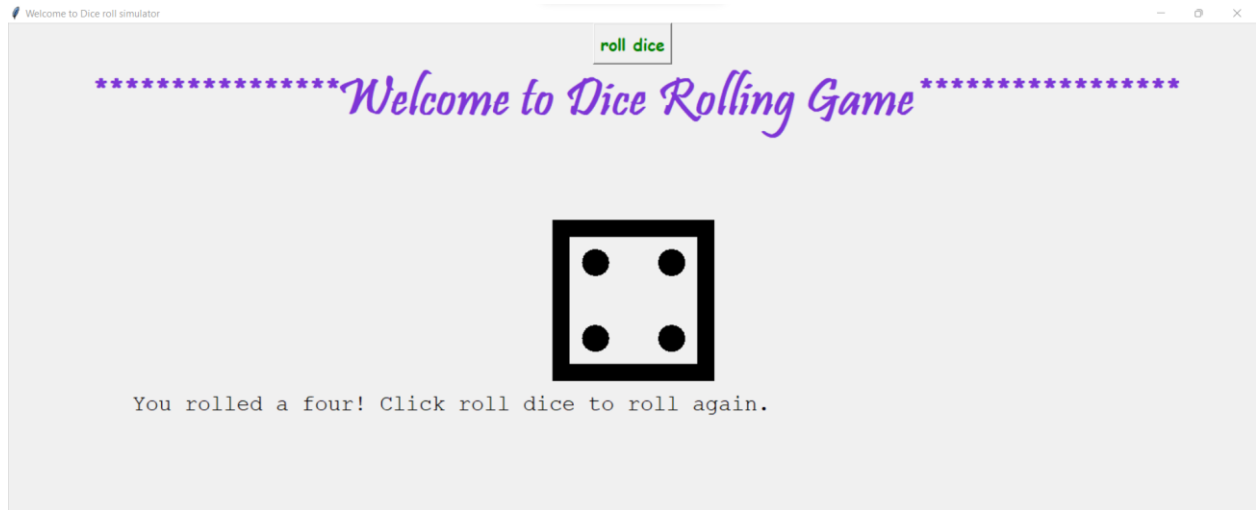
Fig. 5.1.1 Display rolled Four

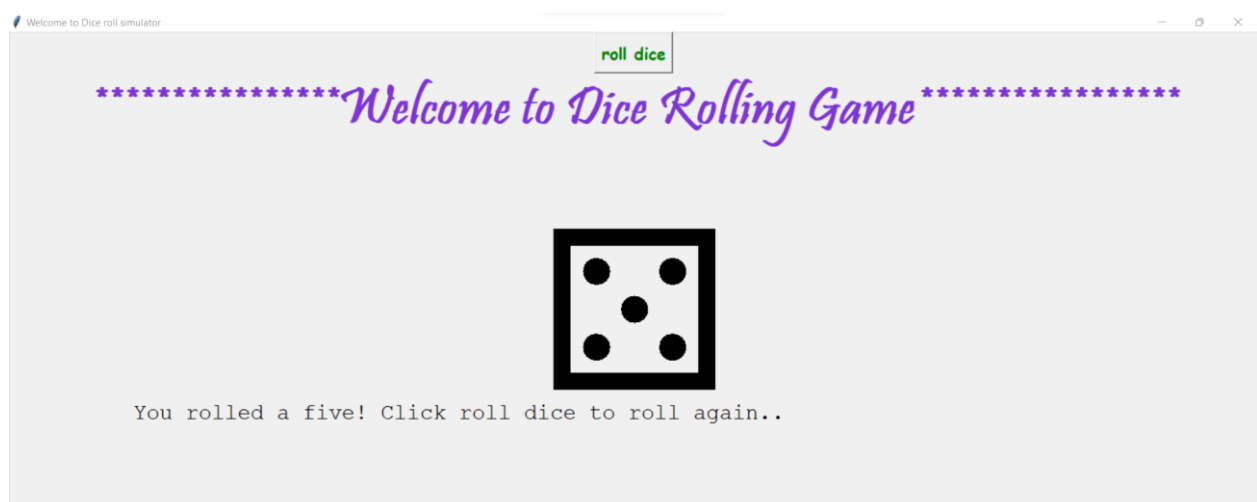**Fig.5.1.2** Display rolled Six

Fig. 5.1.3 Display rolled Two

Fig.5.1.4 Display rolled Three

Fig. 5.1.5 Display rolled One

Fig. 5.1.6 Display rolled Five

5.2 DISCUSSION

As we expected the Dice Rolling Simulator is working fine the Unicode images of dice are been shown randomly as a real dice rolls .we have successfully implement dice roll where we have printed the dice faces whenever a butten roll is been pressed with the random print every next time when we press button .

We are going to use the random module in Python to imitate a dice roll. The random module comes preloaded in the Python programming language, making it simple to include into your code. After importing the random module, you have access to all of the module's functionalities. It's a large list, but we'll utilize the random.randint () method for our needs. Based on the start and end values, this method outputs a random number. This reasoning may be used to imitate a dice roll since the lowest value of a dice roll is 1 and the biggest is 6. This is what we'll use in our random.randint () method to get the start and finish numbers. Let's have a look at how to replicate a dice roll in Python.

5.3 APPLICATION

The major application of dice roll simulator is done in online game and as wells as offline games which are most popular the most of the game include are:

Snake and Ladder:

Each player should roll one die to see who gets the highest number. Whoever rolls the highest number gets to take the first turn. After the first player takes a turn, the person sitting to that player's left will take a turn.

Gambling:

Shooting dice, also known as street craps, is a classic gambling game where one player (the shooter) rolls a pair of dice and the other players place bets on the outcome of the roll. To start the game, all of the players "ante up" by contributing a small pre-determined amount of money to the pot.

Monopoly:

In the game of Monopoly, a pair of dice are rolled to move a player's piece around the board. If a double is rolled (the dice show the same number), the player receives another roll of the dice.

Ludo:

In India Ludo is often played with two dice, and rolling 1 on a die also allows a token to enter active play. Thus if a player rolls a 1 and a 6, they may get a token out and move it six steps. In Pakistan, a variation that uses two dice allows backwards movement.

Checkers:

The player throwing the higher number now moves his checkers according to the numbers showing on both dice. After the first roll, the players throw two dice and alternate turns. The roll of the dice indicates how many points, or pips, the player is to move his checkers.

Poker:

Poker dice is a game that allows people to play a form of poker without having cards. The way it works is that each player rolls 3 times and the best hand wins. The reason I think this may be the reason dice are included in poker sets is because it exactly requires 5 dice.

CHAPTER 6
CONCLUSION

We have designed and developed a Dice roll simulator by applying **engineering knowledge** which provides an approach in building a device where users can Roll a dice similar to real dice rolling. It solved the critical problem of unfair dice roll by program.

We have **identified** and analyze problem in current situation where same face of dice are rolled simultaneously and online games requirement cannot be fulfilled by dice rolled simulator

We have used tkinter for creating a GUI platform where all operations can be shown further, roll button will be created than by pressing the roll button image of dice faces will be printed by using random library. Therefore this is successfully project for dice roll simulator.

We coded a fully functional project consisting of a text-based user interface application that simulates the rolling of six-sided dice in Python. With this project, you learned and practiced fundamental skills, such as gathering and validating the user's input, importing code, writing functions, using loops and conditionals, and displaying nicely formatted output on-screen.

We have used **Modern Tools** like VS code, tkinter and Numpy to implement this project. During the development of the project we have applied professional ethics and we understood the importance of the project and had implements the essential function to roll a dice. We understood the importance of **individual** work .We enhanced our communication skills and displayed professional ethics which results in **lifelong learning.**

REFRENCES

- https://www.askpython.com/python/examples/dice-roll-simulation
- https://www.w3schools.com/python/gloss_python_random_number.asp