DELHI TECHNOLOGICAl UNIVERSITY

DISCRETE MATHEMATICS
[IT-205]

Project Report

Name: Manan Grover

Roll No.: 2K19/IT/075

Name: Kumar Setu

Roll No.: 2K19/IT/068

CANDIDATE' S DECLARATION

We, Manan Grover (2K19/IT/075) and Kumar Setu (2K19/IT/068), students of B.Tech(INFORMATION TECHNOLOGY), hereby declare that the project titled, "Pendamic Simulator" which is submitted by us to the Department of INFORMATION TEACHNOLOGY, Delhi Technological University, Delhi in partial fulfilment of the requirement for the award of the degree of the Bachelor of Technology, is original and not copied from any source without proper citation. This work has not been performed previously for the award of any degree, Diploma Associateship, fellowship, or similar title or recognition.

Place: Delhi
Date: 01/12/2020

ACKNOWLEDGEMENT

I would like to convey our heartfelt thanks to our supervisor, Mrs. Swati Sharda for her ingenious ideas, tremendous help and cooperation.

I am extremely grateful to my friends who gave valuable suggestions and guidance for completion of my project. The cooperation and healthy criticism came handy and useful with them.

Finally, I would like to thank all the above-mentioned people once again.

INTRODUCTION

To understand the nature of today's pendamic, we created this simulator entirely using numpy and matplotlib in python based on SIR model.

following are the files in the project:

1. motion.py: file that contains all function related to population mobility and related computations
2. population.py: this file contains functions that help initialize the population parameters for the simulation

3. visualizer.py: contains all methods for visualisation tasks

4. config.py: file that contains all configuration related methods and classes

5. infection.py: this file contains all functions required in computing new infections, recoveries, and deaths

6. simulation.py: this is the main file which combines all the above files and run the simulation

FEATURES:

* Helps us visualize the working of pandemic before going through it in real worlsd

* finds most suitable ways to prevent the virus spread and flatten the curve

* gives us not only mathematical model but a visual way to see the spread of a virus

* multiple parameters of population can be easily implemented

* test different prevention methods in simulation

* Based on SIR model in epidemiology which is already tested and reliable algorithm

* Any sort of virus can be tested in the simulation by changing the configuration of the project.

* easy to understand and can be operated by little to no technical background

GitHub Repo:

https://github.com/KuMaRSeTu/Corona-Simulator

CODE SNIPPETS + RESULTS
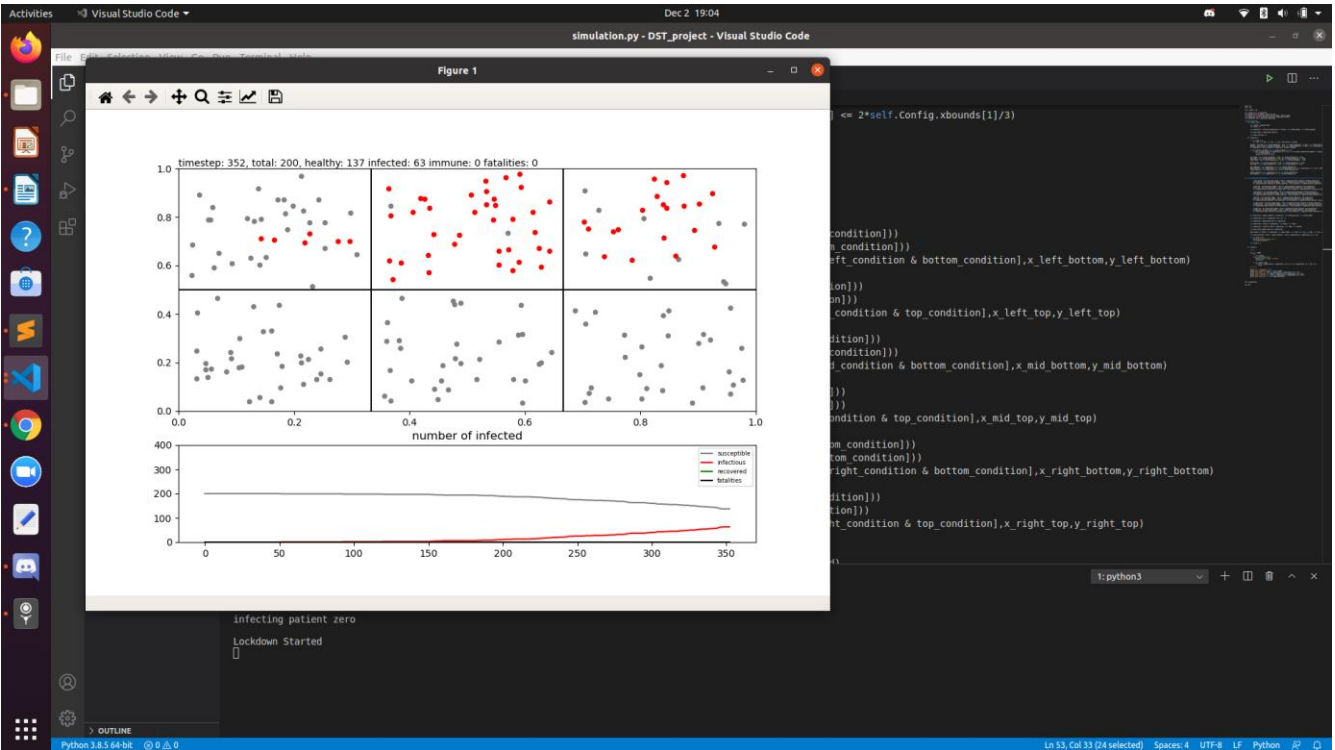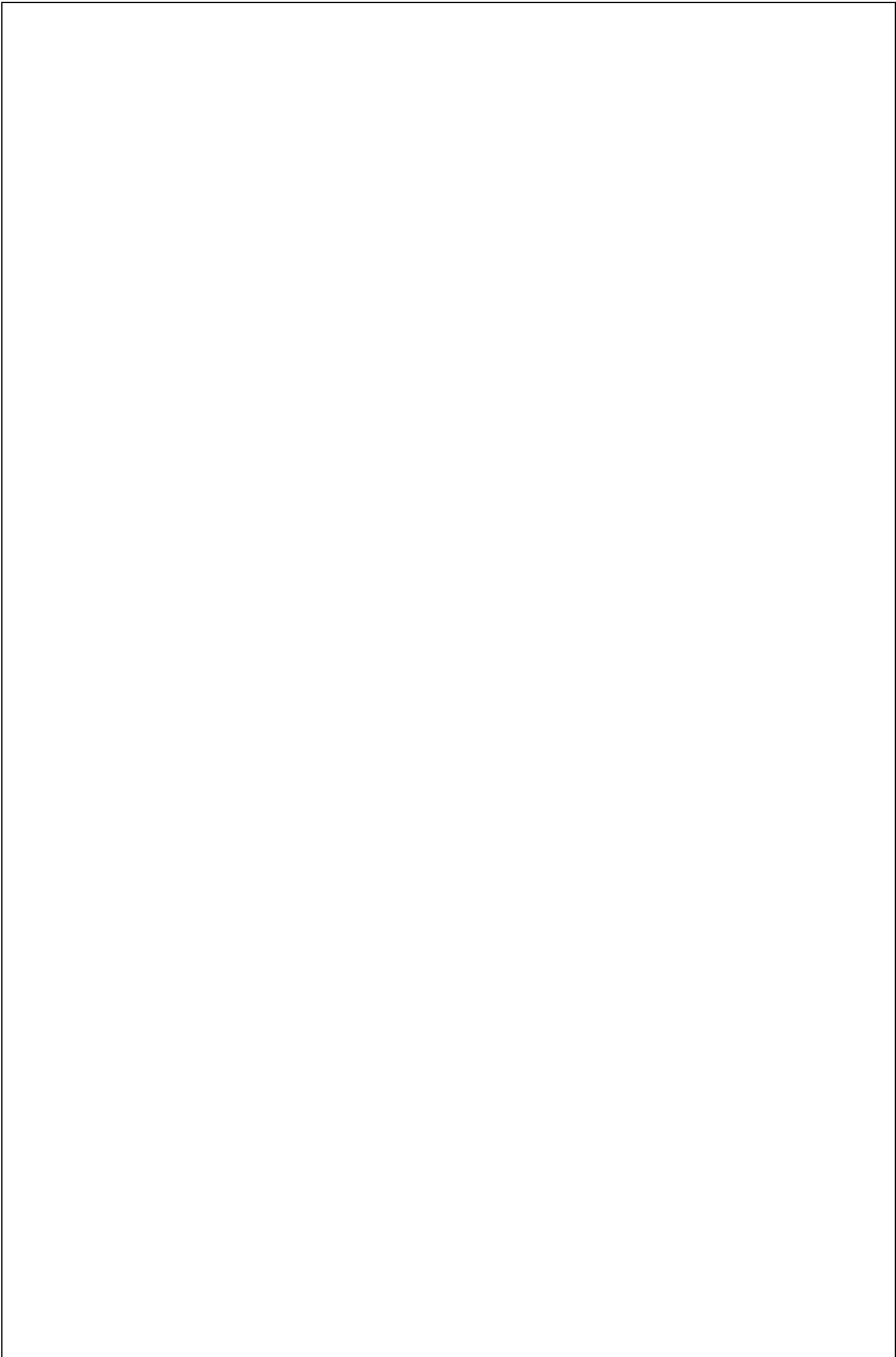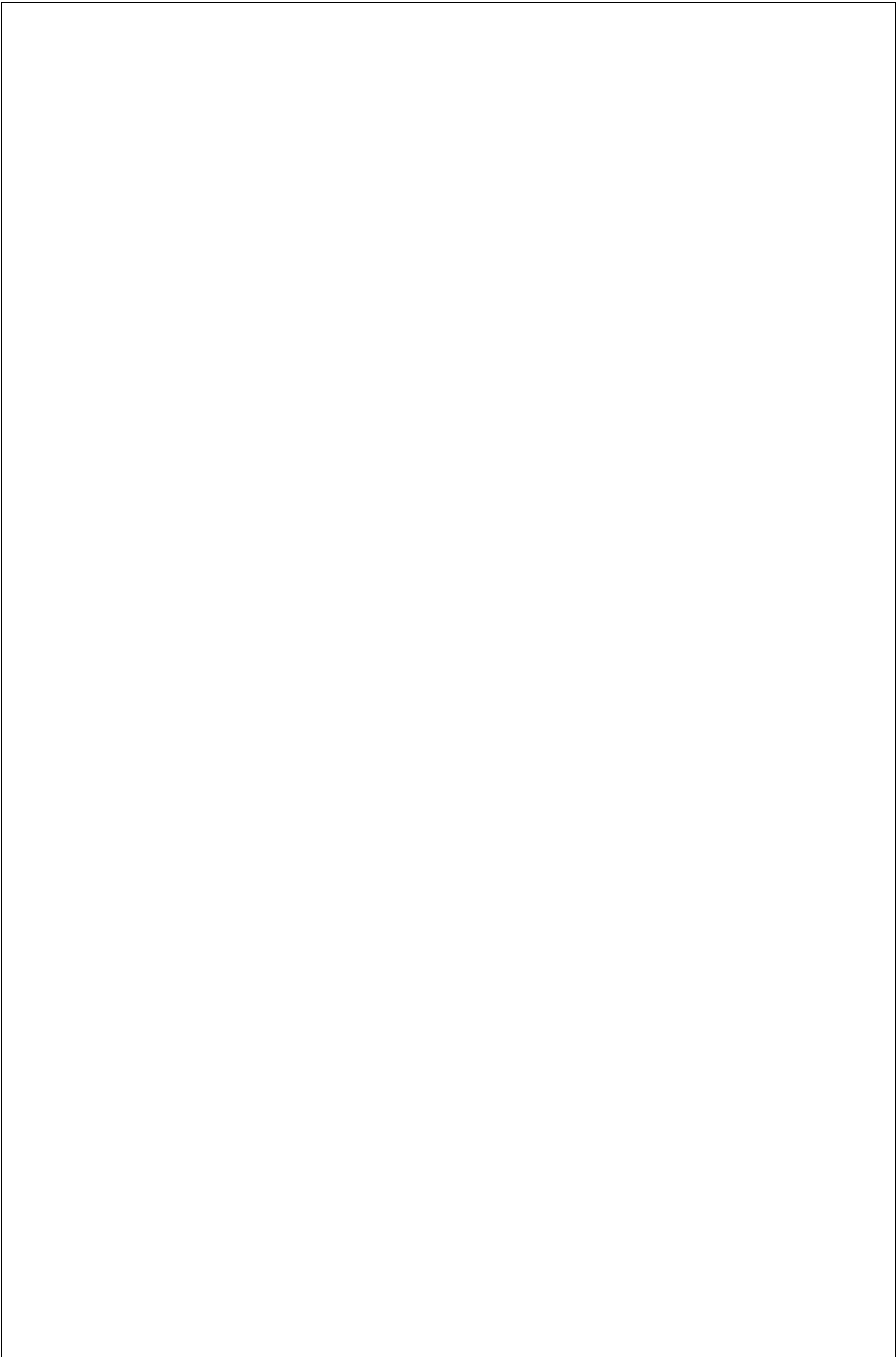
```python
queues = {}

@bot.command(pass_context=True, aliases=['q', 'que'])
async def queue(ctx, url: str):
    Queue_infile = os.path.isdir("./Queue")
    if Queue_infile is False:
        os.mkdir("Queue")
    DIR = os.path.abspath(os.path.realpath("Queue"))
    q_num = len(os.listdir(DIR))
    q_num += 1
    add_queue = True
    while add_queue:
        if q_num in queues:
            q_num += 1
        else:
            add_queue = False
            queues[q_num] = q_num

    queue_path = os.path.abspath(os.path.realpath("Queue") + f"\song{q_num}.%(ext)s")

    ydl_opts = {
        'format': 'bestaudio/best',
        'quiet': True,
        'outtmpl': queue_path,
        'postprocessors': [{
            'key': 'FFmpegExtractAudio',
            'preferredcodec': 'mp3',
            'preferredquality': '192',
        }],
    }

    with youtube_dl.YoutubeDL(ydl_opts) as ydl:
        print("Downloading audio now\n")
        ydl.download([url])
    await ctx.send("Adding song " + str(q_num) + " to the queue")

    print("Song added to queue\n")
```