Worm Isolation System

A project report

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CANDIDATE'S DECLARATION

I hereby declare that the work presented in this report entitled "Worm Isolation System" in fulfilment of the requirement for the assessment of 3rd semester in Information Technology, in Data Structure submitted in Information Technology Department at DELHI TECHNOLOGICAL UNIVERSITY, New Delhi, is an authentic record of my own work carried out during my degree under the guidance of Mrs. Swati Sharda.

The work reported in this has been submitted by me for an award of 3rd Semester assessment.

Date: 15th May , 2020
Place: New Delhi

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CERTIFICATE

On the basis of the Major Project submitted by Vaibhav (2K19/IT/138), and Yash Vardhan Patari (2K19/IT/147) students of B.Tech. (IT). I hereby certify that the project titled "WORM ISOLATION SYSTEM" which has been submitted to Department of Information Technology, Delhi Technological University in partial fulfilment of the requirement for the assessment of 3rd semester in Information Technology is an original contribution with existing knowledge and faithful record of work carried out by them under my guidance and supervision.

Place: -Delhi

Date: - 24th Nov 2020

Mrs. Swati Sharda
Delhi Technological University

ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we all are extremely privileged to have got all this along the completion of our project.

All that we have done is due to such assistance and we would not forget to thank them.

As the completion of this project gave us much pleasure, we would like to express our special thanks of gratitude to Mrs. Swati Sharda at Delhi Technological University who gave us the opportunity to do this Wonderful project. I would also like to extend my gratitude to all those who have directly and indirectly guided me in completing this project.

Secondly, we would like to thank our parents and friends who have helped us with their suggestions and guidance that has been very helpful in finalizing this project.

Many people, especially our classmates have helped us a lot by giving their suggestions on our project which gave us an inspiration to improve the quality of the project.

ABSTRACT

In today's world number of bad people trying to access your data has increased drastically and security has become a concerning issue and has gained so much importance in the previous decade. Our project deals with those worms sent by the hackers to gain access over your computer and sometimes taking whole network down by the spread of such worms. One major example is of the ransomware that spreads in UK which created a hassle among the hospitals as it demands money to be transferred in bitcoins to release the database saved in those computers which strangled the whole community.

And to prevent such things from happening we have tried our hands in creating a small program prototype that shows how we can do it at a small scale.

NetworkX is a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks.

NetworkX provides:

- tools for the study of the structure and dynamics of social, biological, and infrastructure networks;
- a standard programming interface and graph implementation that is suitable for many applications;
- a rapid development environment for collaborative, multidisciplinary projects;
- an interface to existing numerical algorithms and code written in C, C++, and FORTRAN; and
- the ability to painlessly work with large nonstandard data sets.

Objective

In this project, we are learning how to create a system to isolate worms that attacks the node on a network using python programming knowledge. The algorithm behind the project is simple as it detects the node attacked and starts working from there to abandon the node and create edges between its neighbors to prevent network from getting disconnected.

We have used graph theory to implement our project fully and have used NetworkX a python library to implement graphs fully.

Algorithm

Algorithm for the Network Worm Isolation System

Step 1: Create Network sockets for network establishing go to step 2

Step 2: Find isolation points on the network go to step 3

Step 3: Put safety measures on nodes found in step 2, go to step 4

Step 4: Send data containing worms to test the network go to step 5

Step 5: If worm found on node shut the part of network and go to step 6, else go to step 7

Step 6: Encrypt the data on the network go to step 7

Step 7: Transfer the data go to step 8

Step 8: Restart the test by going to step 1.

Working

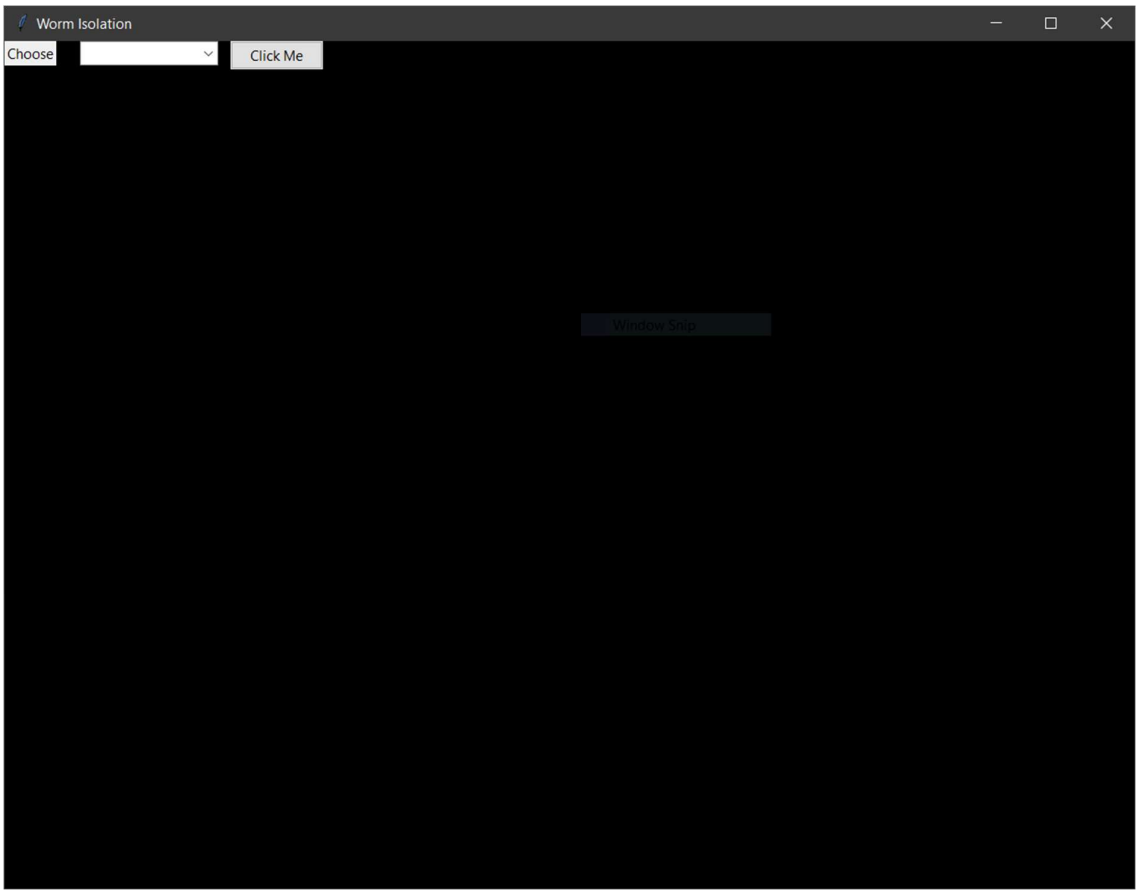

Fig1.0

Fig1.0 shows the opening window which appears when the program is started now, we select nodes creation and creates some nodes which is being shown in fig1.1.

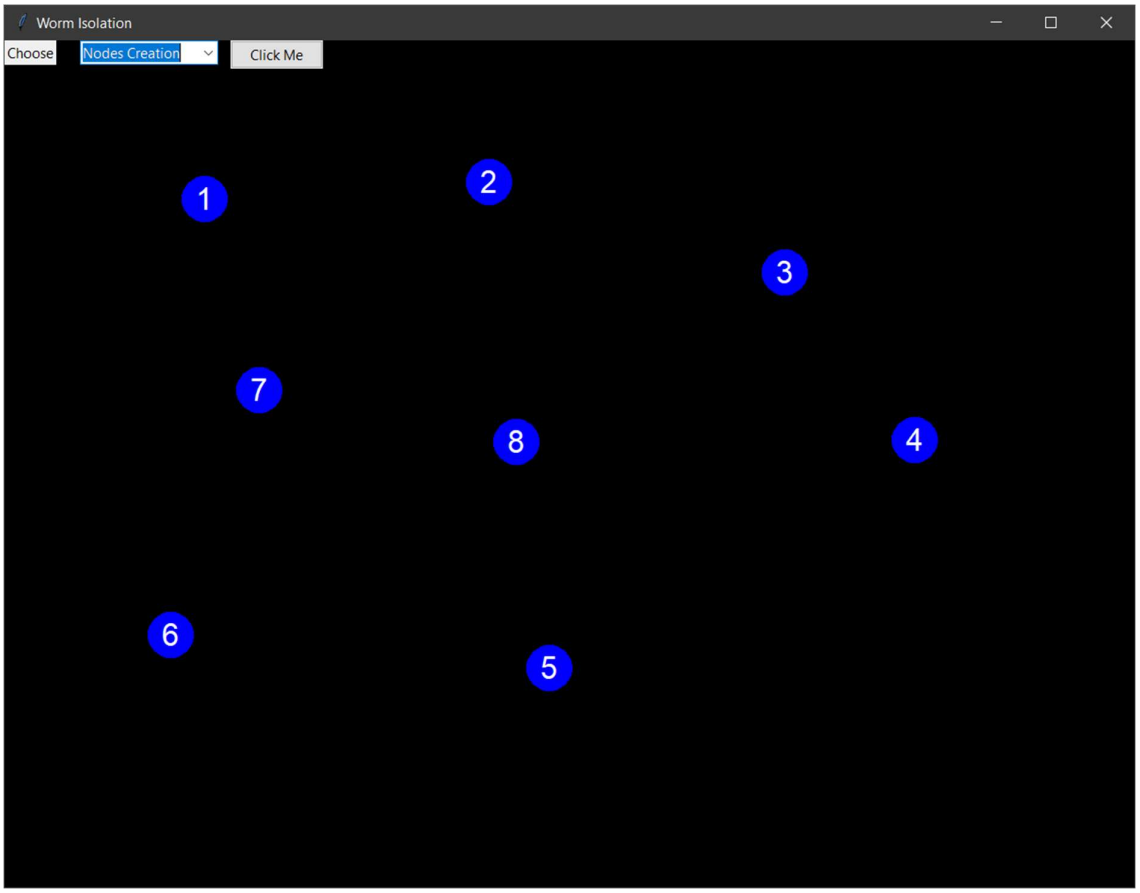

Fig1.1

We create the nodes by clicking on the canvas wherever we want and in the next figure we will create edges by touching the node and other node simultaneously for e.g. we want to create an edge between 1 and 4 we will click 1 first then 4 the edge will be created.

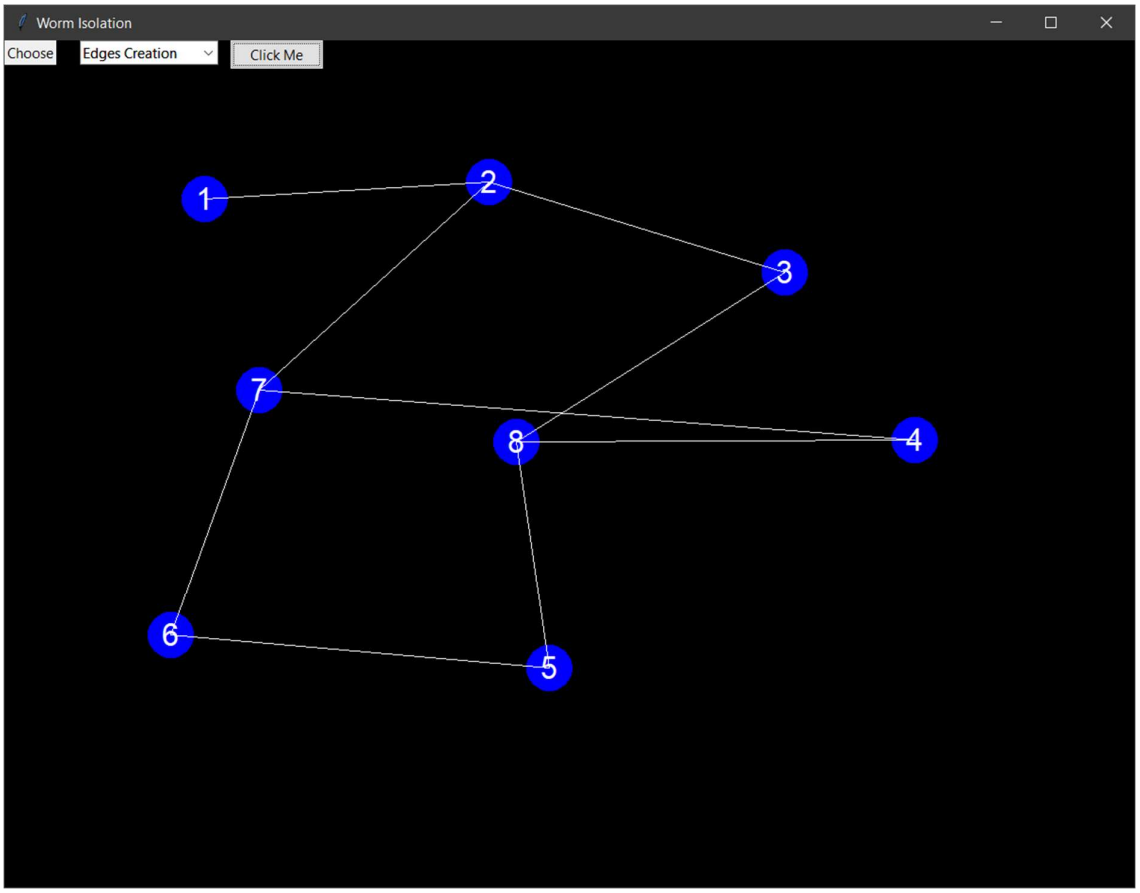

Fig1.2

Here is the final graph/network created by us which will be attacked by the worm.

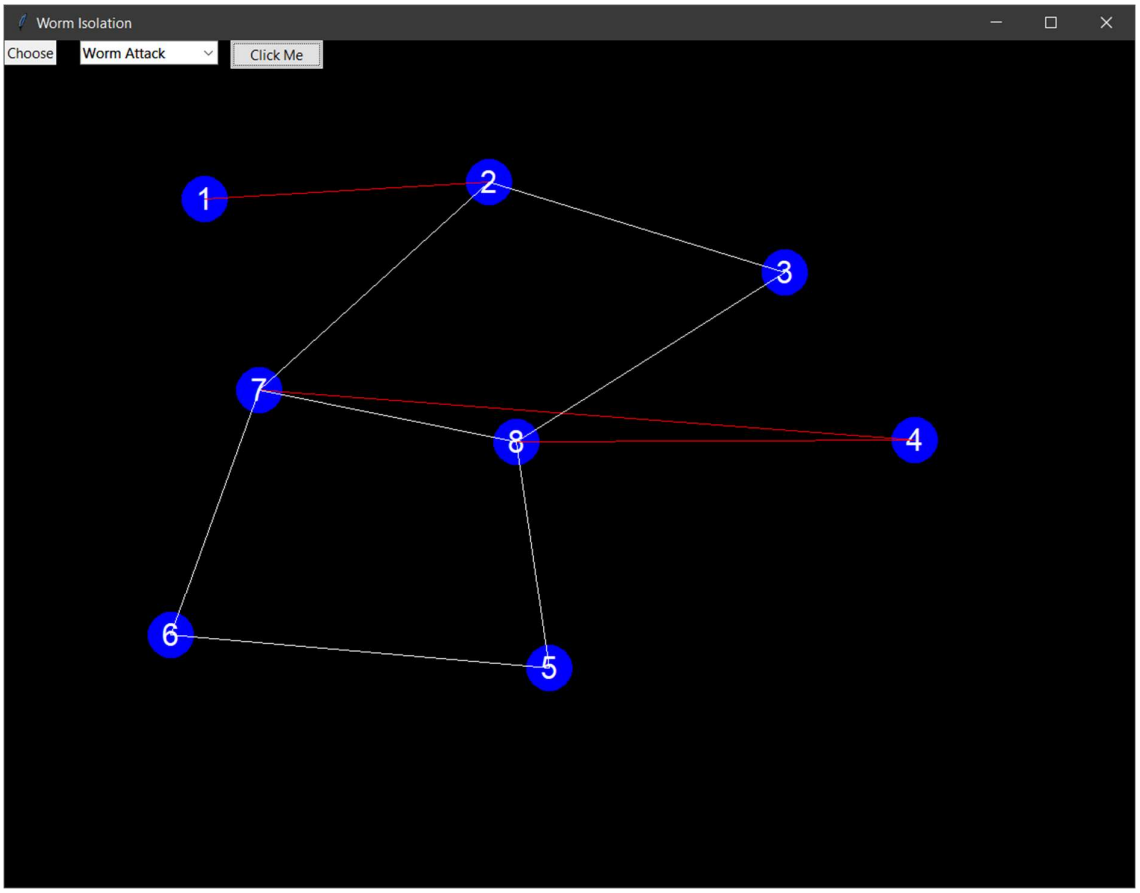

Fig1.3

Here worm attack happens and we click the nodes to be attacked for e.g. in above fig 1 and 4 are clicked its edges with other nodes are cut or in other words it is isolated.

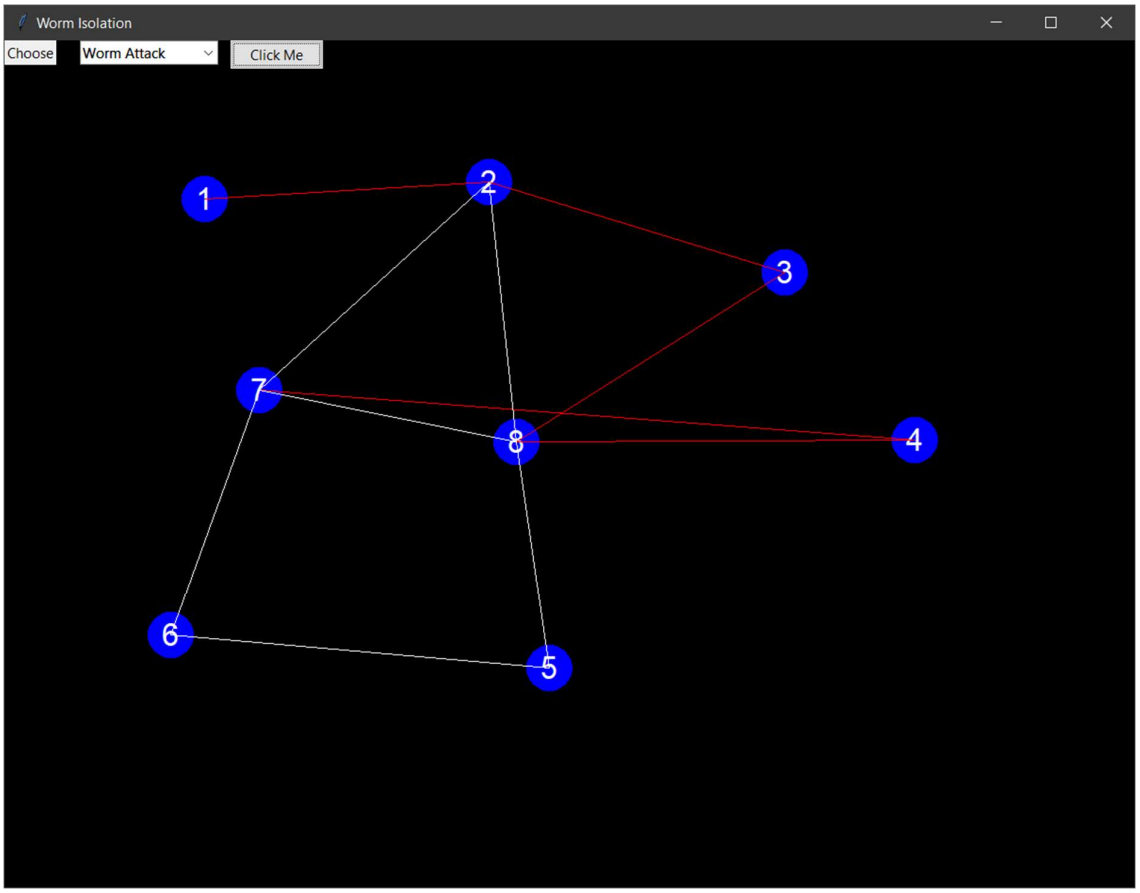

Fig1.4

As we clicked node 3 there is an extra edge created between 2 and 8 as it would have created a slowness in the path between 2 and 8 hence we creates extra edges between those nodes which are disconnected because of the procedure followed by the program.

Conclusions

In this project, we used the python's NetworkX for backend processing of graph and tkinter for front end. We learnt how to create graphs and perform different functions on them for example finding neighbours of a node and cutting its edges and recreating them. And for front end we learnt creation of canvas using of combobox for selection purposes, creating rounded buttons or buttons of any other shape, we also learnt how to bind keys with specific functions some object oriented programming is also used in our project. Overall this project has helped both of us to grow in each and every aspect possible.

We also learnt a lot about graph theory some algorithms such as DFS, BFS and Djikstra's algorithm etc.

Github Repository

https://github.com/yashpatari/Worm-Isolation-System.git

Bibliography

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