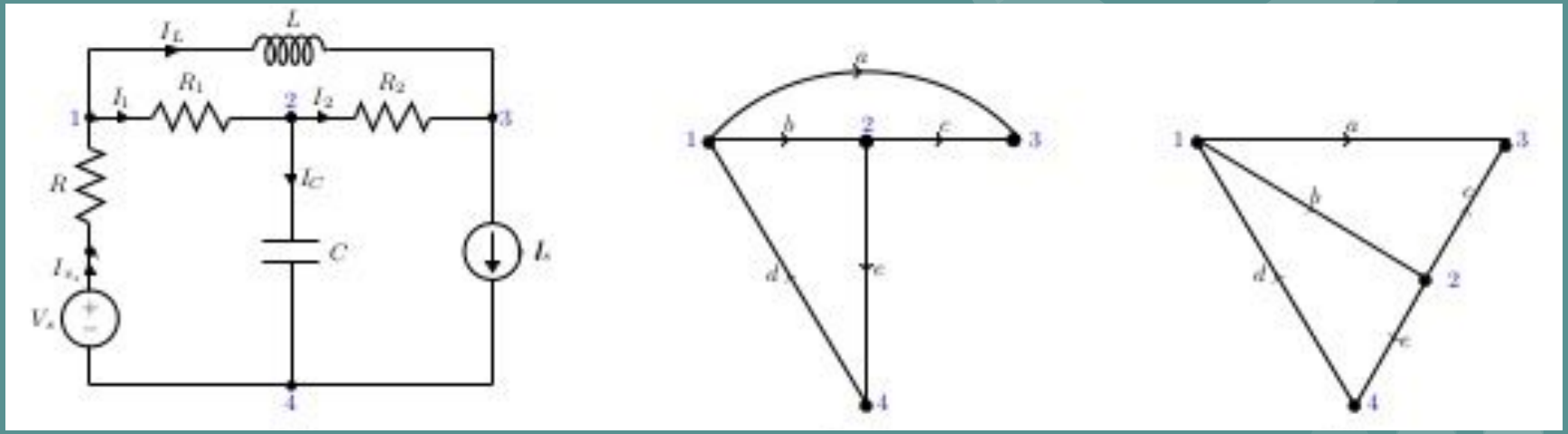
Graph Theory using Twitter dataset

Mini Project

By: Surbhi Sonkiya

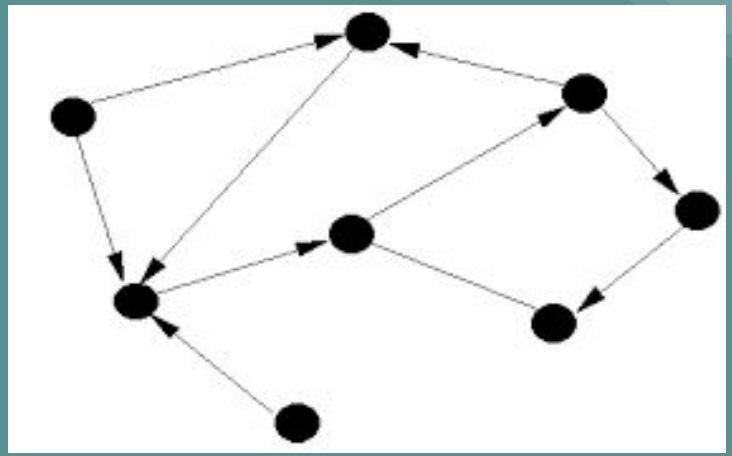
The Story!

Graph theory for circuit analysis

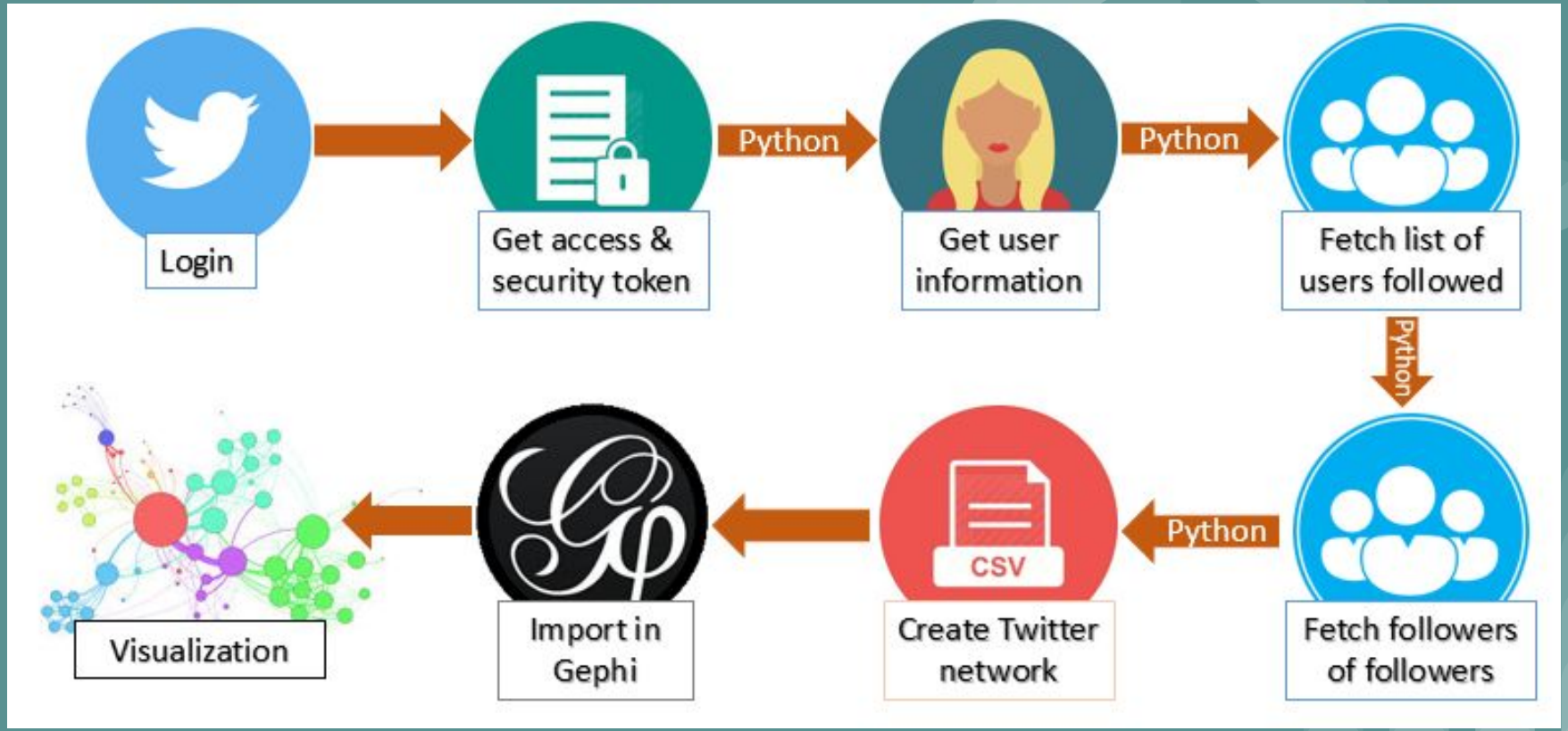


Project Description

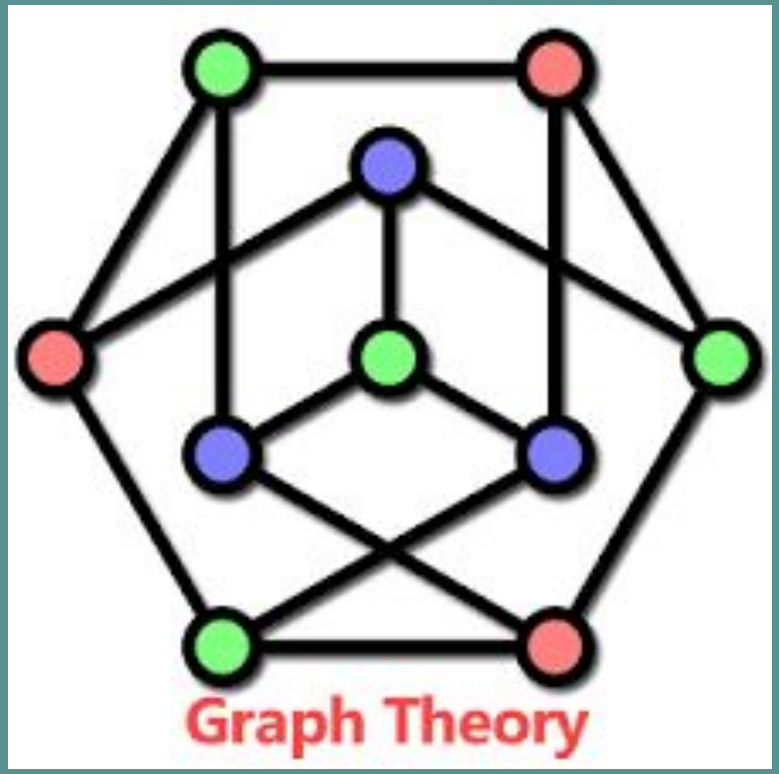
To create a directed network of followers (example friends of friends) on social media like Twitter.



Process Flow

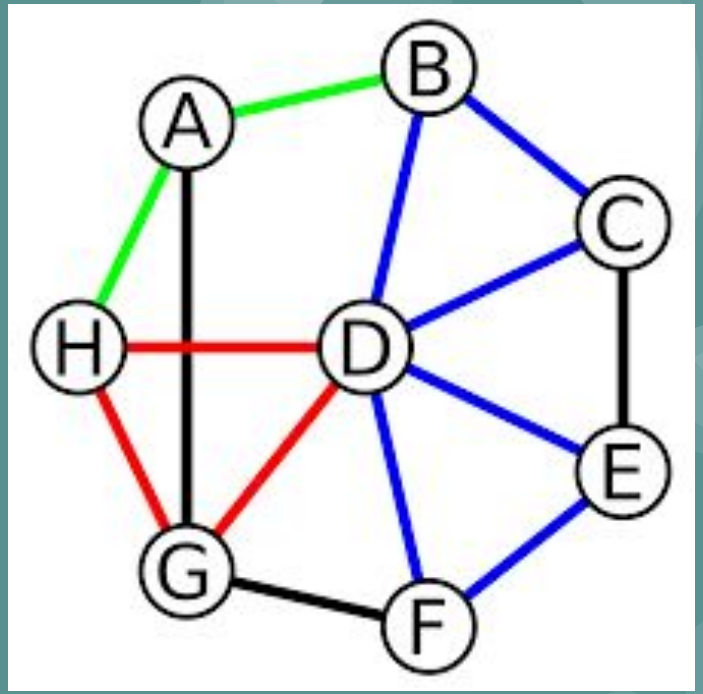


What is Graph Theory?

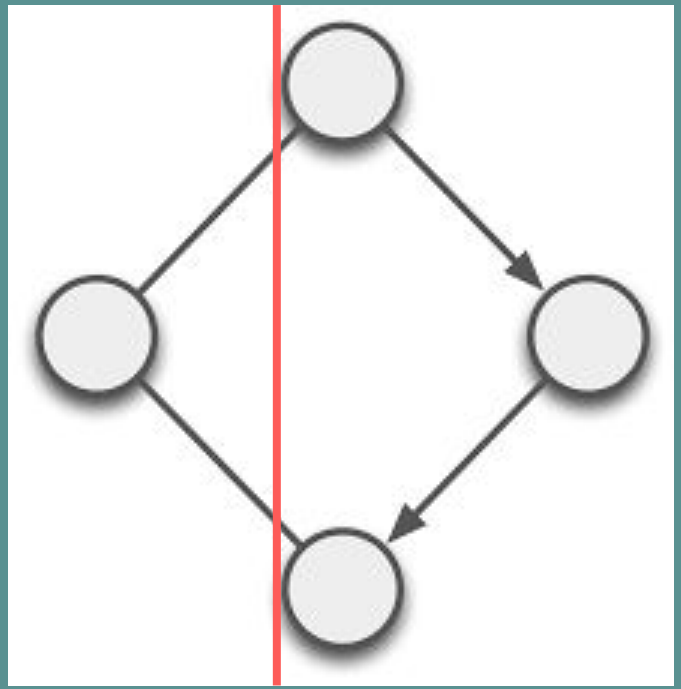


Elements of Graph Theory

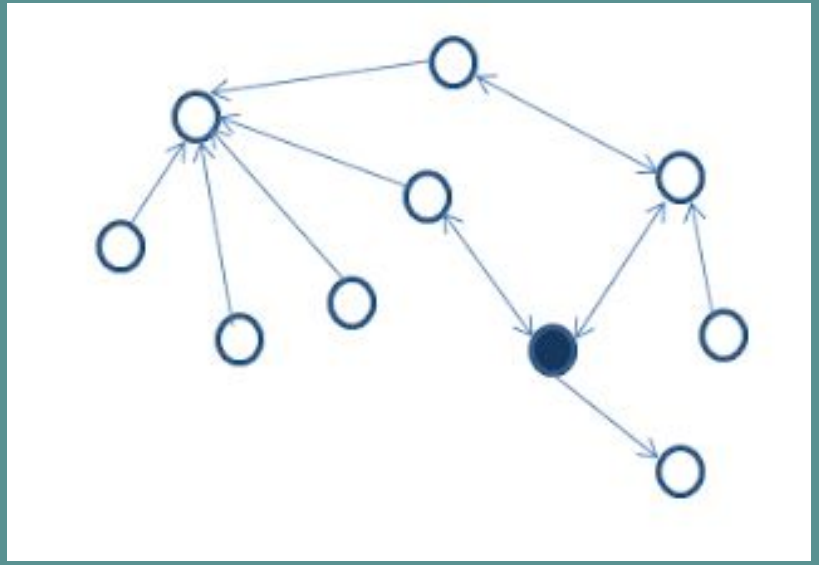
- Edges
- Vertices
- Weight
- Degree
- Depth
- Direction



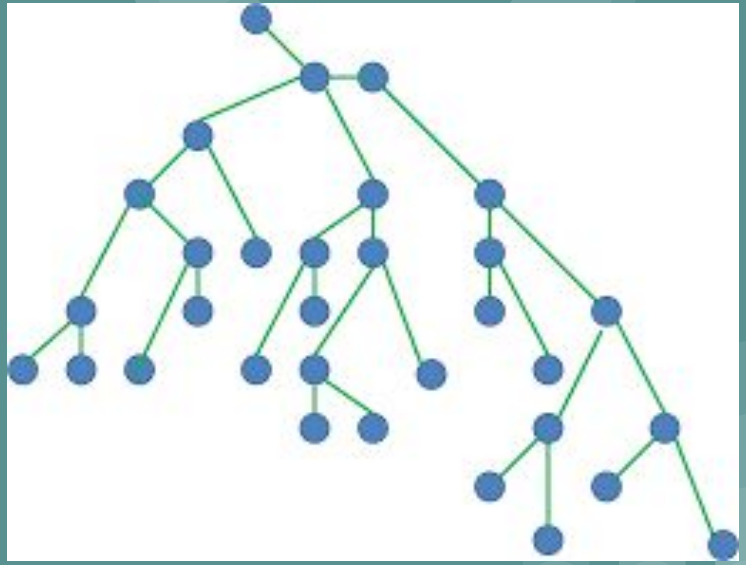
Depth; d=2



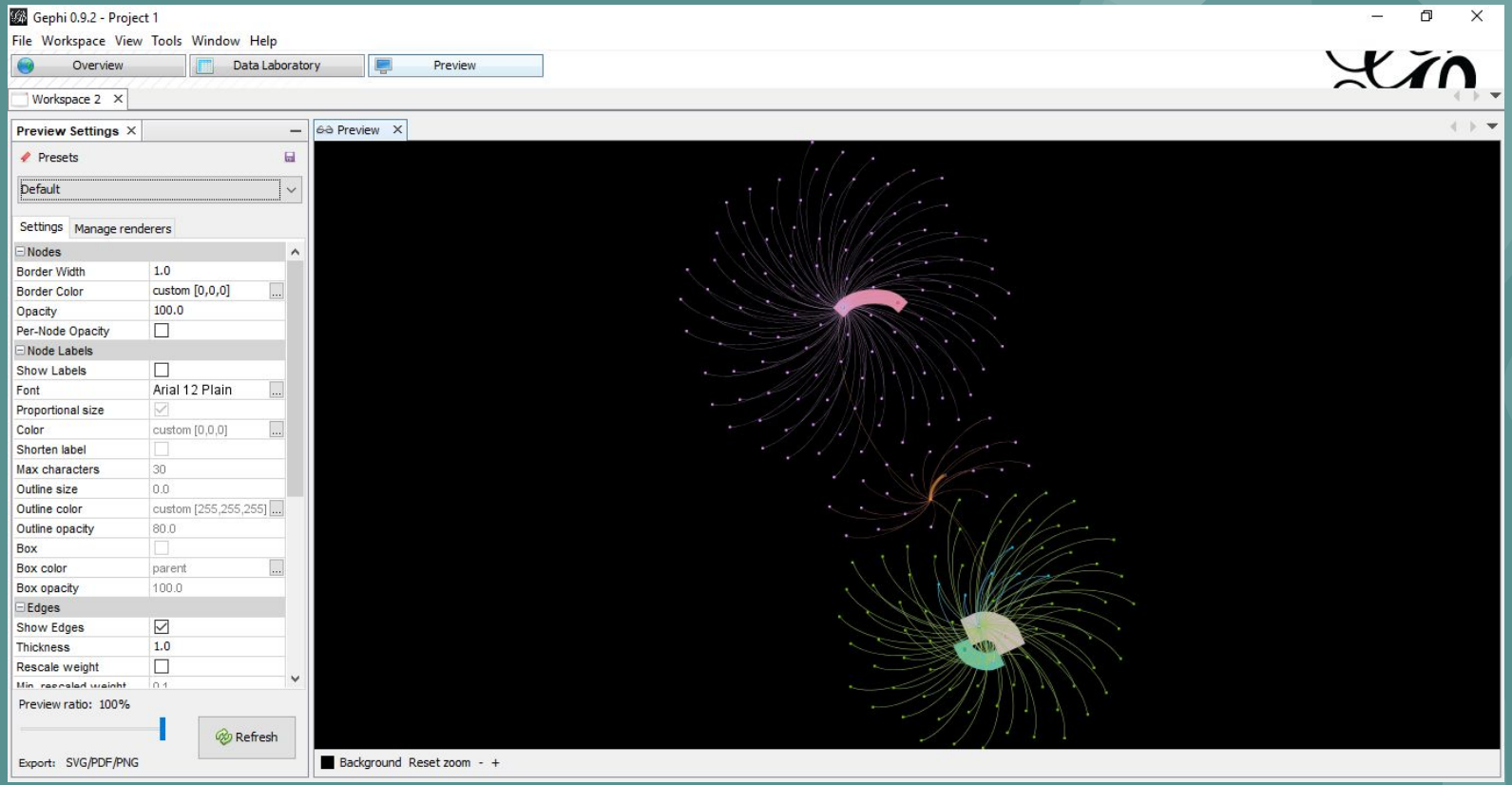
Twitter Connection



Facebook Connection



Graph of Twitter user: Surbhi Sonkiya



Python Code

```
$ sudo python UserFollowers.py -s SonkiyaSurbhi -d 2
```

```
surbhi@surbhi-Lenovo-G50-80: ~/Downloads/twitter-1.18.0
surbhi@surbhi-Lenovo-G50-80:~/Downloads/twitter-1.18.0$ sudo python UserFollowers.py
 -s SonkiyaSurbhi -d 2
Max Depth: 2
Retrieving user details for twitter id 871648804562386944
No cached data for screen name "SonkiyaSurbhi"
Retrieving friends for user "Surbhi Sonkiya" (SonkiyaSurbhi)
Found 23 friends for SonkiyaSurbhi
Retrieving user details for twitter id 1042287121342640128
No cached data for screen name "PreetiNambiar1"
Retrieving friends for user "Preeti Nambiar" (PreetiNambiar1)
Found 141 friends for PreetiNambiar1
Retrieving user details for twitter id 708954721
No cached data for screen name "ammachilabs"
Retrieving friends for user "AMMACHI Labs" (ammachilabs)
Found 36 friends for ammachilabs
Retrieving user details for twitter id 152933590
No cached data for screen name "AMRITAedu"
Retrieving friends for user "Amrita Vishwa Vidyapeetham" (AMRITAedu)
Found 55 friends for AMRITAedu
Retrieving user details for twitter id 2493823368
No cached data for screen name "TeamMakenai"
Retrieving friends for user "Makenai" (TeamMakenai)
Rate limited. Sleeping for 15 minutes.
```

Python Code

SonkiyaSurbhi.csv (~/Downloads/twitter-1.18.0/following) - gedit

Open

```
708954721           ammachilabs      AMMACHI Labs
152933590           AMRITAedu        Amrita Vishwa Vidyapeetham
2493823368          TeamMakenai      Makenai
2362618909          WomenTechmakers  Women Techmakers
1078811162          Yogadarshanam1   Santhosh Kumar
881185415004278784      theworldscourt   Ravi Chandra Manda
```

871648804562386944.json (~

Open

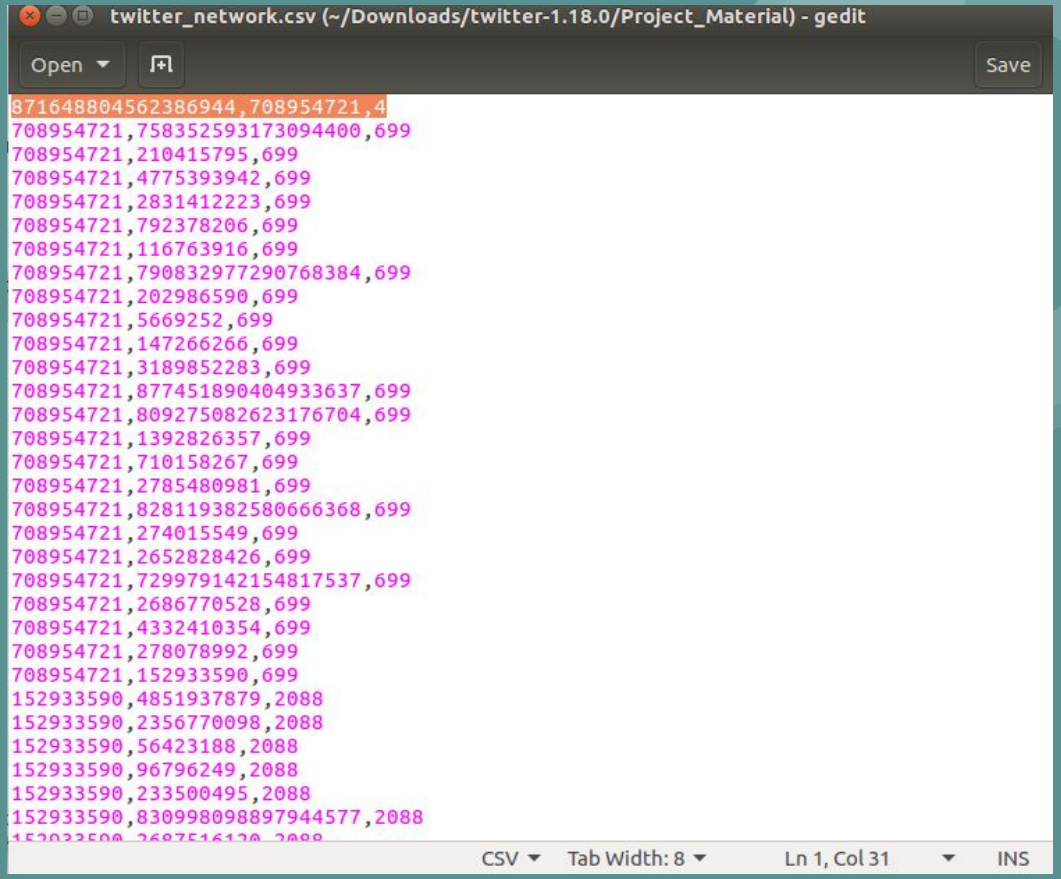

```
{
 "followers_count": 4,
 "name": "Surbhi Sonkiya",
 "friends_count": 22,
 "created_at": "2017-06-05 08:44:04",
 "followers_ids": [
  1049945873311064064,
  2356770098,
  617900934,
  1137113455
 ],
 "id": 871648804562386944,
 "profile_image_url": "http://abs.twimg.com/sticky/default_profile_images/
default_profile_normal.png",
 "screen_name": "SonkiyaSurbhi"
}
```

Python Code

```
$ sudo python CreateNetwork.py -s SonkiyaSurbhi
```

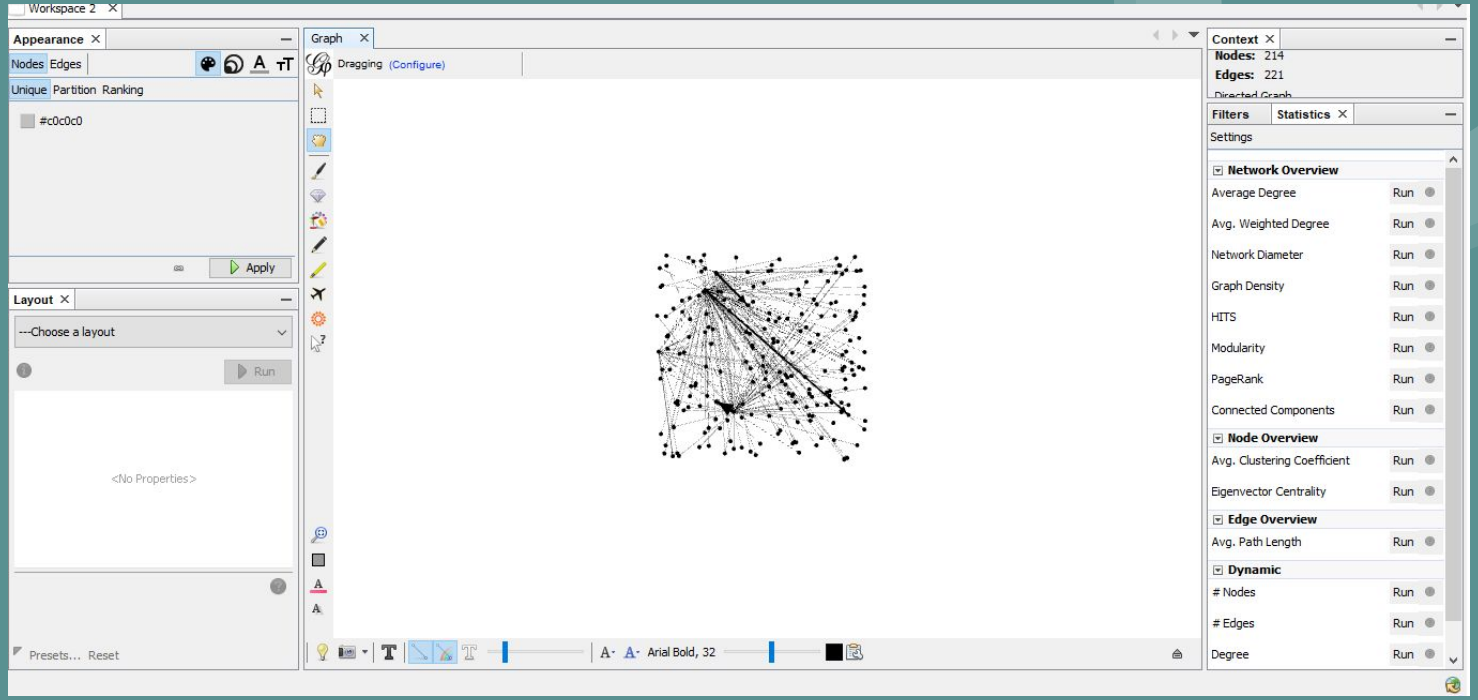
```
surbhi@surbhi-Lenovo-G50-80: ~/Downloads/twitter-1.18.0
surbhi@surbhi-Lenovo-G50-80:~/Downloads/twitter-1.18.0$ sudo python CreateNetwork.py
 -s SonkiyaSurbhi
loading twitter-users/1042287121342640128.json
loading twitter-users/708954721.json
loading twitter-users/152933590.json
loading twitter-users/2493823368.json
loading twitter-users/871648804562386944.json
processing following/SonkiyaSurbhi.csv
processing following/PreetiNambiar1.csv
processing following/CEEWIndia.csv
processing following/BlrLitFest.csv
processing following/ProfVarshney.csv
processing following/DannyQuah.csv
processing following/WSJ.csv
processing following/HCI_London.csv
processing following/UKinBengaluru.csv
processing following/FollowCII.csv
processing following/manojladwa.csv
processing following/IndiaIncorp.csv
processing following/inBritish.csv
processing following/tradegovukIND.csv
processing following/UKinIndia.csv
processing following/Unibocconi.csv
processing following/CarnegieMellon.csv
```

Twitter Network CSV

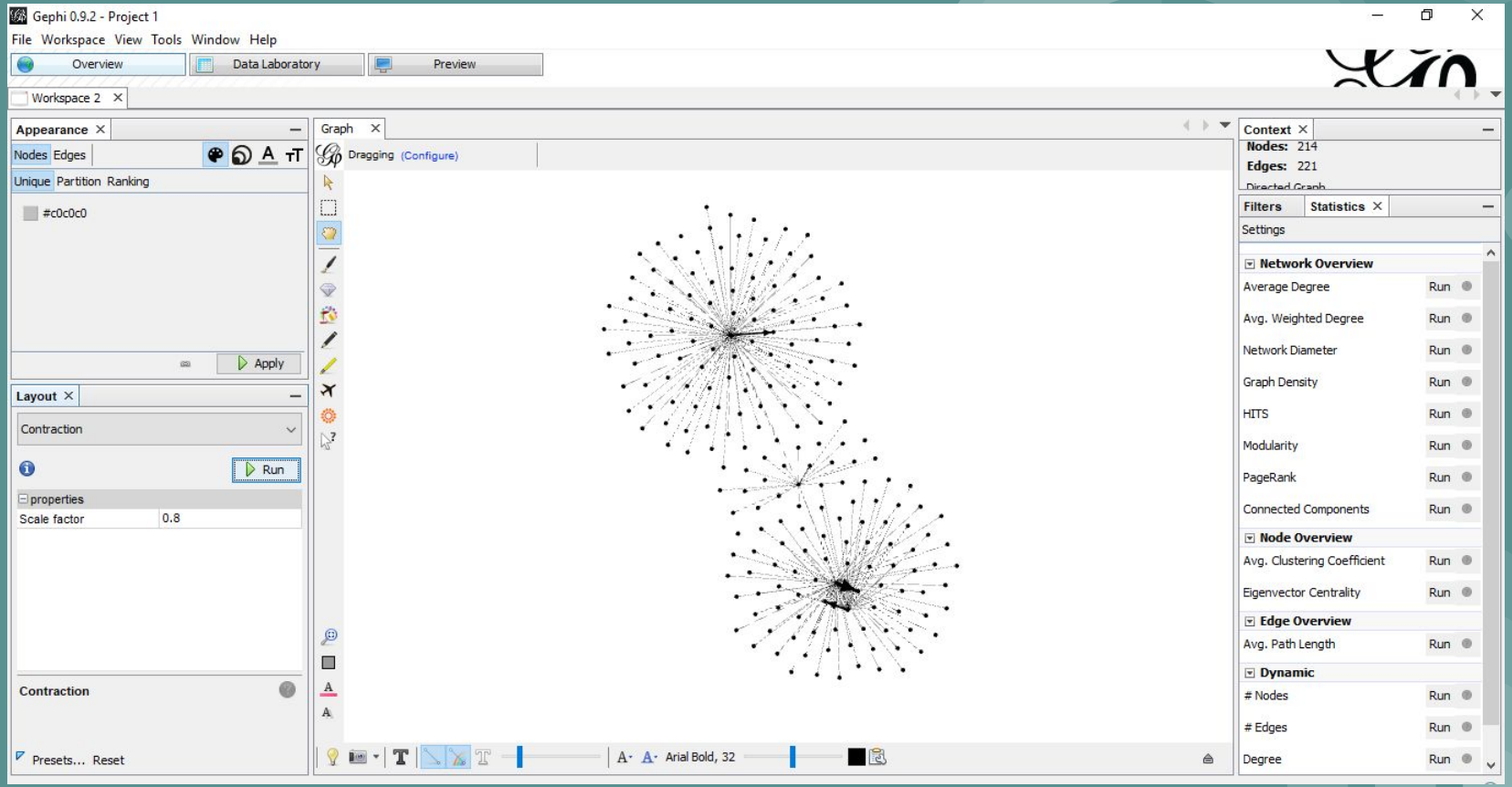


Gephi

The Open Graph Viz Platform is the leading visualization and exploration software for all kinds of graphs and networks.

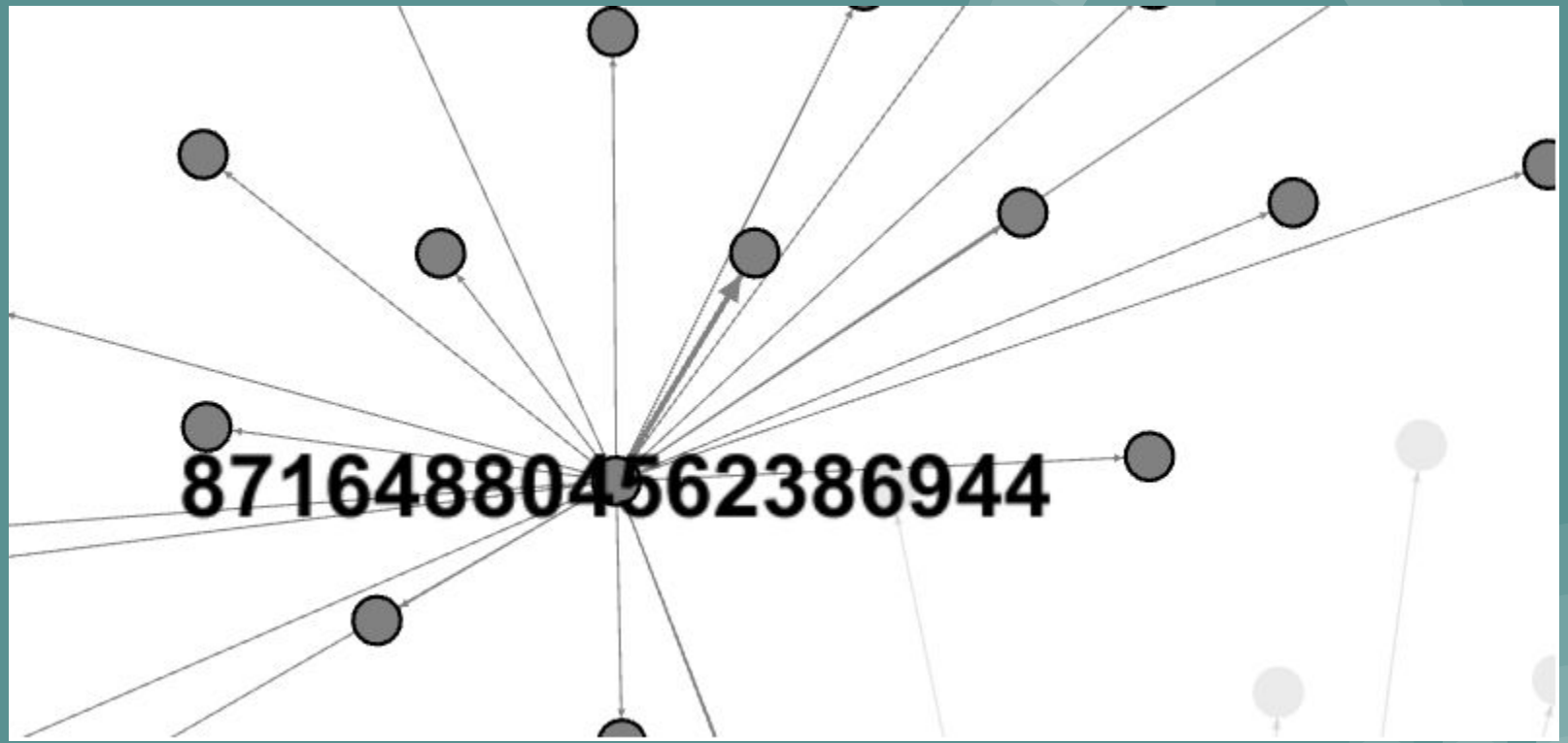


Gephi Features



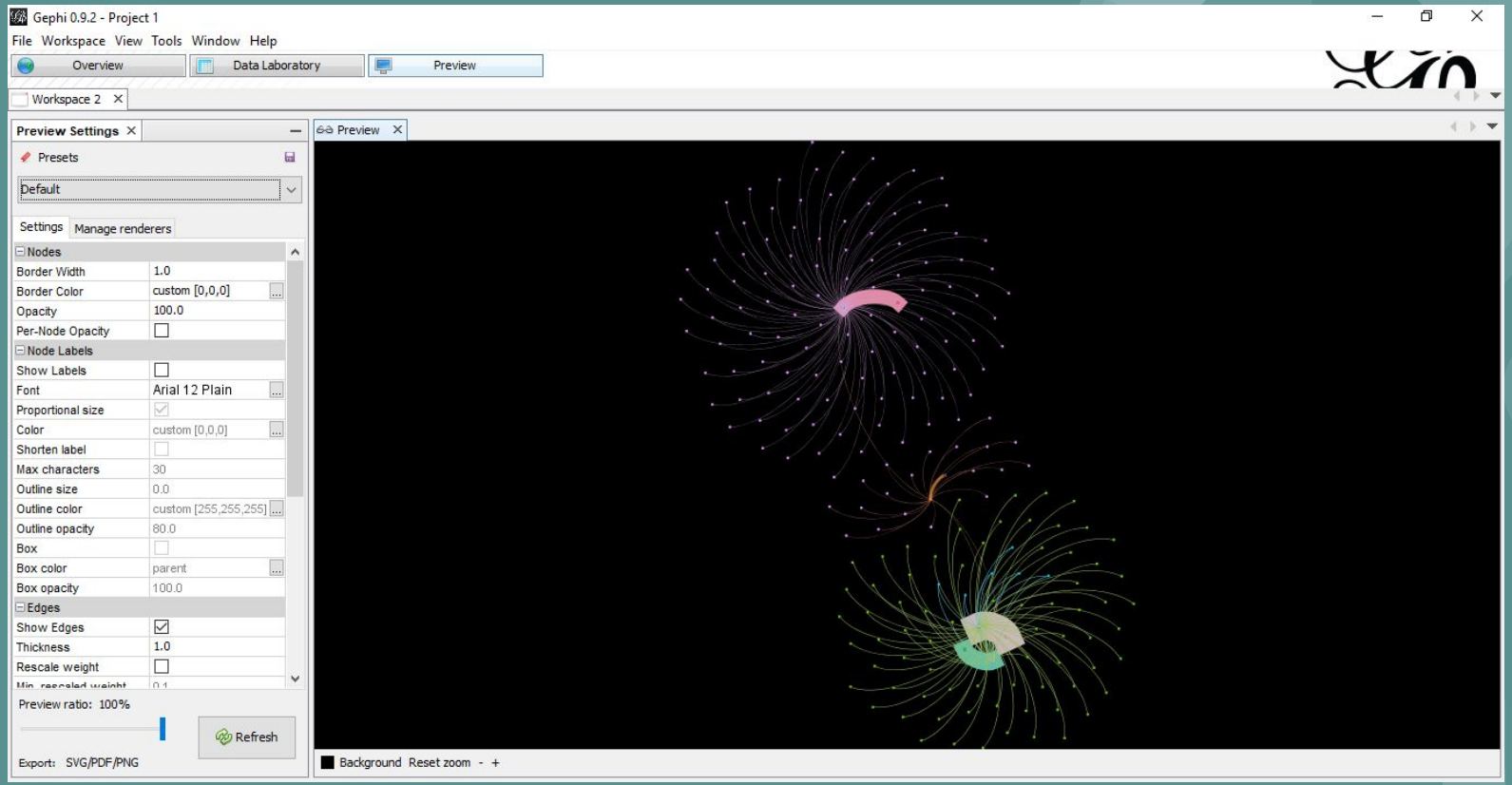
Directed Graph

Twitter user: Surbhi Sonkiya and **Twitter user ID: 871648804562386944**



Graph of Twitter user: Surbhi Sonkiya

Weight of nodes and Ranking of edges



Future work

To solve the “shortest path” problem:

- **Graphs used for elections, discrete mathematics, etc.**
- What is the quickest way to get from one node to another?
- For example, Linkedin tells you how many degrees of introduction you are away from another person. Likewise, the internet solves this problem to figure out how to quickly send messages between your computer and Google’s server.
- This is probably the single most important problem in graph theory.

References

1) http://itssubhamoy.blogspot.com/2013/07/twitter-facebook-graph-theory.html
2) https://www.slideshare.net/Kadir_Akib/graph-theory-presentation-75148446
3) https://en.wikipedia.org/wiki/Graph_theory
4) https://developer.twitter.com/en/docs.html
5) https://gephi.org/

Thank you!