ABSTRACT

Now a days social network is one of the most important topic to talk about because as everyone having an account on social networking platform where they share their life experience, memes and posts. This is very important to think about the security of users and network connectivity. As per the recent studies human spend most of his life span on social networking apps.

Here I came up with same tool like social networking website where people can achieve same functionality like twitter and Instagram. But there is one more thing addition to this for the admin where he can take track of so many things like viral marketing, valuable nodes or viral meme quality.

As this all analysis will make network more stronger and trustworthy, even it will lead to business strategy to be deal on social networking platform

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my respected and learned guide, **Prof. Nishat Shaikh** for their valuable help and guidance, I am thankful to them for the encouragement they have given me in completing the project.

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Lastly, I would like to express my deep apperception towards our classmates and my in indebt ness to my parent for providing me the moral support and encouragement.

Mann Mehta

(17IT051)

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ABBREVIATIONS

SNA	**Social Network Analysis**
ONA	**Organizational Network Analysis**
#	**No. (number)**

INTRODUCTION

1.1 PROJECT OVERVIEW

1.1.1 What is Social Network?

A social networking service is an online platform which people use to build social networks or social relationship with other people who share similar personal or career interests, activities, backgrounds or real-life connections. The social network is distributed across various computer networks.

1.1.2 Why Social Network Analysis?

A Social Network Analysis (SNA) – Sometimes called Organizational Network Analysis (ONA) – is a set of tools and processes for understanding the relationship in a network. In social networks, the members or nodes of the network are people and/or organizations and the links are the relationship between these people and organizations. Using computer-aided analysis, SNA practitioners can produce maps and graphs that displays the patterns of connections between the nodes of the network.

These maps reveal characteristic of the network that help guide participants as they evaluate their loop holes and make them improve.

Now, days Social Network Analysis is very important analysis, where solutions to case study like Network Attacks, Social Reinforcement, Virality, Viral Marketing etc.

Social Network Analysis (SNA) get his popularity over the past few years, because this give direct loop holes that prevent business to spread among the end users at the same time it give solution to that loop holes or problems, such that business head can take actions and conquer the loop holes.

This kind of analysis not only helpful to business also it will help to all user to be protected in the social network as the they all are sharing everything on social network, Social Network must have to firm on the end user security.

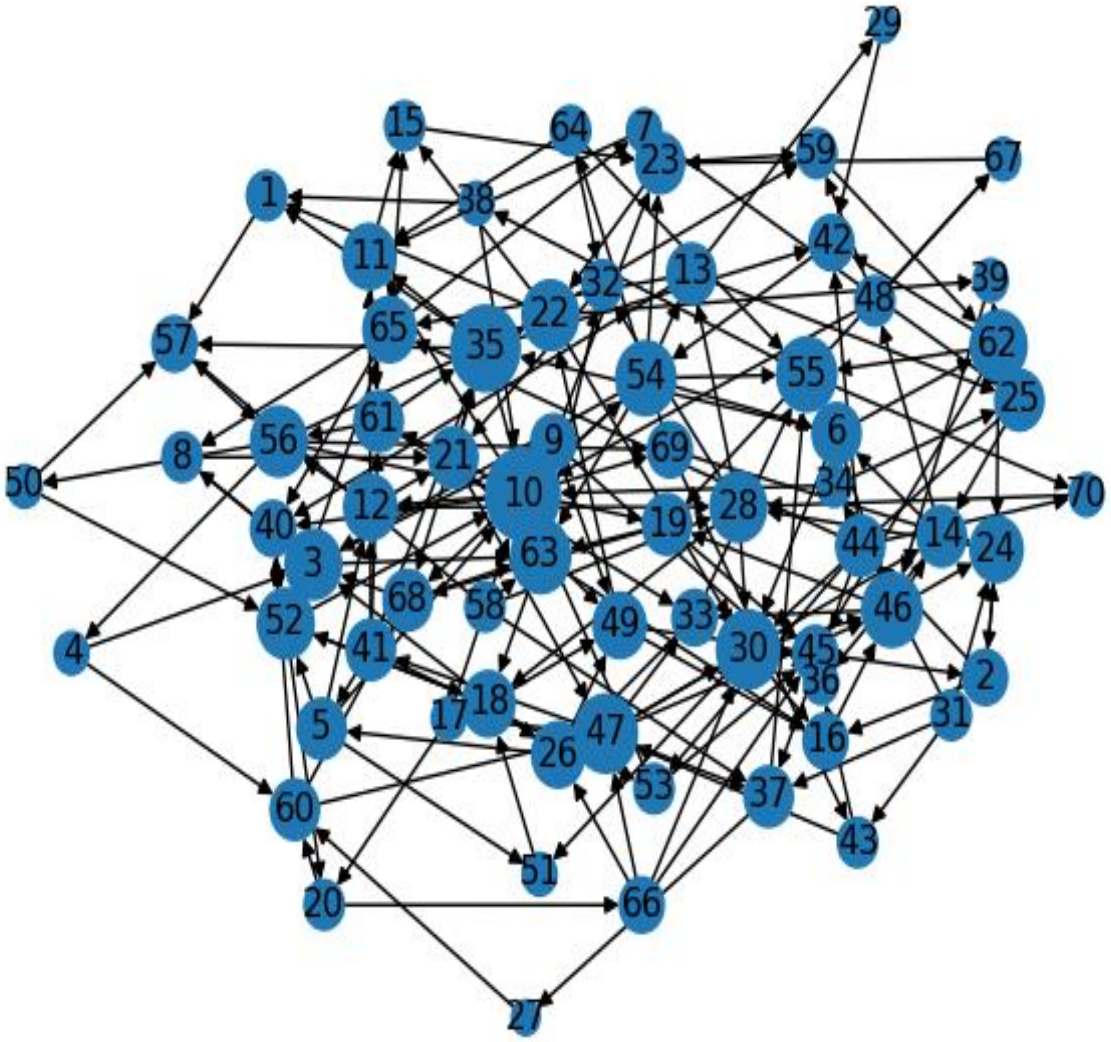


Fig 1.1 (Network Graph)

Fig. 1.1: - This is a Social Network of 70 users where each node represents a user and each directed edges represent about a user followed by another user.

As this above network giving so many information to us, this type of network we are going to use for further case studies and relate this network to give some amazing solution to the real world problems which still not solved yet.

1.2 SCOPE

1.2.1 Viral Marketing

The marketing landscape has evolved to a great extent with the advent of internet strategy integration, refined internet marketing metrics, increase in wireless networking, rising consumer ownership of computers, the era of big data and e-commerce, influences marketing and the evolution of the internet.

The special terms Netnography introduce as field of study under Social Network Analysis, and explore their potential toward the domain of marketing.

Hence future potential of the two methodologies of Netnography and SNA (social network analysis) as marketing research methodologies.

1.2.2 Network Security

The recent study says that people are now exposed on the social network or we can say social media, where people are shares their privacy or private data among the other people. Whenever we talk about the network attacks or special nodes attacks hackers usually pick most valuable nodes try to get that node down such that whole social network got disturbed. This will lead to failure of user trust or many other harmful effects on end user.

Now a days, we are not totally got free from this attacks still there are some attacks via memes are going on for example **MOMO CHALLENGE** this will lead to so many deaths of children such that it just a horror meme which give task to children to do some harmful action on them or on his family.

In last, we have to stop this unhealthy virality of meme where SNA (social network analysis) came into the picture. We will discuss this part in further slides so stay tuned.

1.3 OBJECTIVE

1.3.1 Developing Social Media like Twitter and Instagram

A social networking service like Twitter and Instagram where end user got the features of follow someone, share post or tweets, and he also get recommended user depends upon user interest and users he currently following.

Developing same scenario like Twitter, and adding real world data set for actual working and analysis purpose.

1.3.2 Analysis on Social Media

An admin panel where admin can track of all the activities going on social network which have to be dynamic (Always give analysis till date). Where admin can track of:

a) # of Groups in the network.
b) Biggest group in whole network.
c) Valuable nodes/users in network.
d) No of bridges.
e) No of articulation points.
f) Which groups having high tendency to merge together?
g) SCC (Strongly Connected Groups) within Groups.
h) Social Reinforcement breakpoints.

1.3.3 Analysis on a meme about its virality.

In our day to day life we have seen that most of the user using social media and spent their time on either spreading network, adding new post or seeing following users post.

Now what we are seeing is very important, that is good or not? Sometimes some post or meme are affecting a particular community or this will lead to vast disturb in the network where a big group disturbed. Hence which means it will disturbed whole network.

Hence Analysis on such post or meme is really very required thing now a days, fetching all the Memes or Post which are going to viral and track them as this is harmful to any community or not.

SYSTEM ANALYSIS

2.1 USER CHARACTERISTIC

2.1.1 End users who will be receiving service from the system

This type of user got benefited from as they got features like following an user, sharing an post or meme on the network, getting followed by other users and got the list of recommended user (the users he must followed) on the basis of his current friendship or following data.

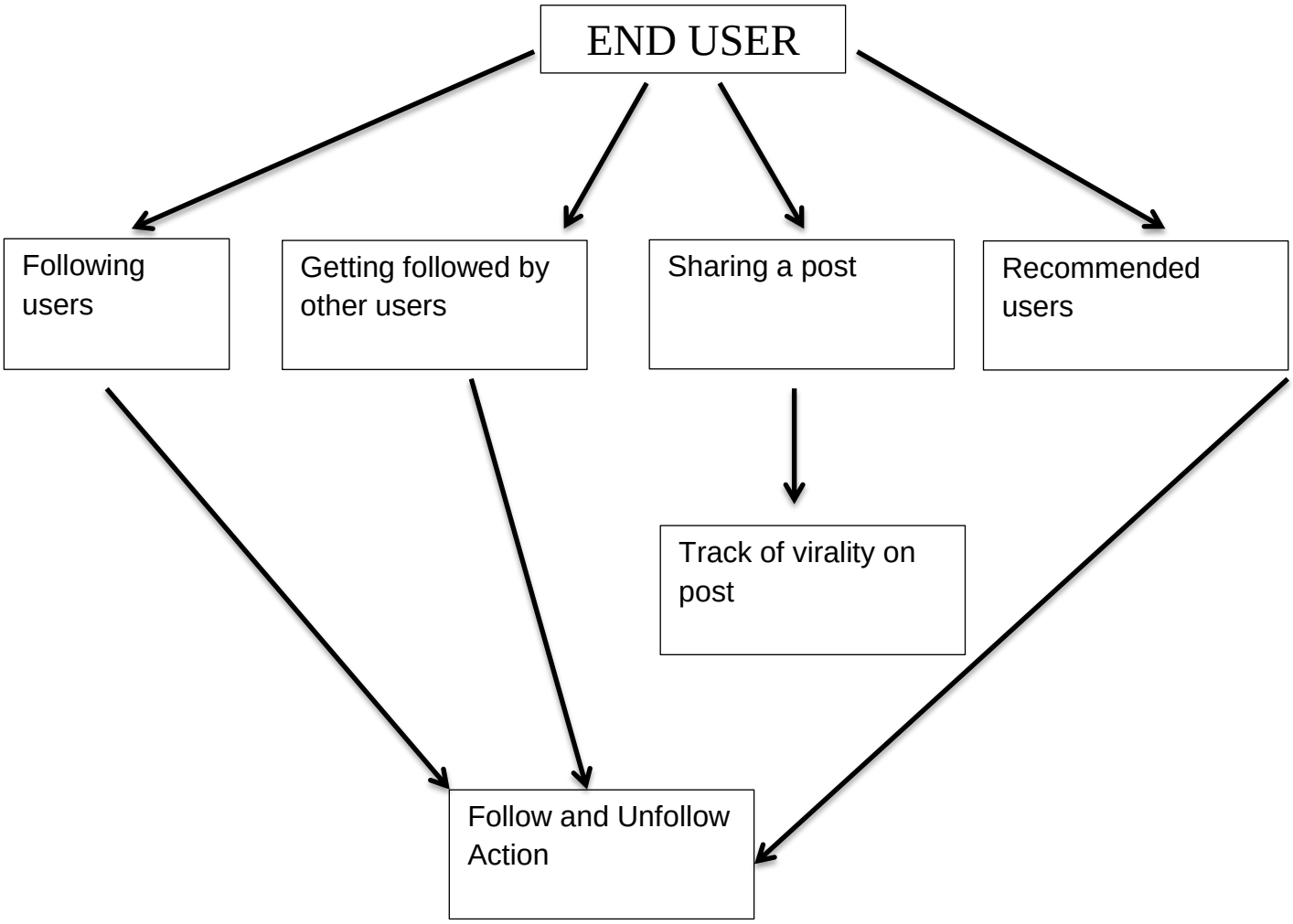


Fig. 2.1 Flow of User Functionality

2.1.2 Admin Analysis Panel

Admin panel is only available to particular owner of the system, where admin having all kind of access on social network such that he can remove, add or delete post.

But that thing only done on the basis of safety, as we are discussing Social Networking Analysis (SNA) admin will have some power or analysis such that admin can visualize things easily.

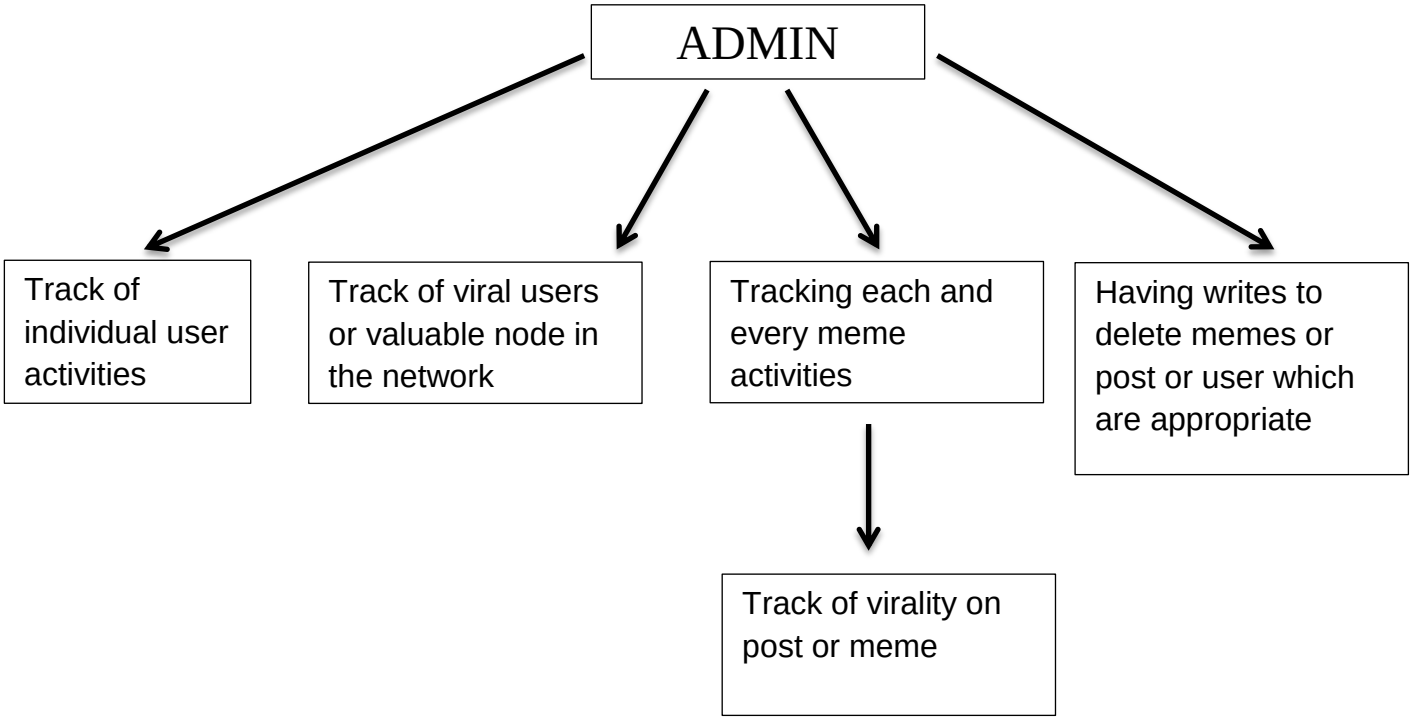


Fig. 2.2 Flow of Admin Functionality

2.2 TOOLS & TECHNOLOGY

2.2.1 Social Media (like Twitter/Instagram)

a) Web development (HTML, CSS, JAVASCRIPT)

b) CSS Framework (Bootstrap)

- Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS- and Javascript-based design template for typography, forms, buttons, navigation and other interface components.

c) Django Framework

- Django is a python-based free and open source web framework, which follows the model-view-template (MVT) architectural pattern. It is maintained by the Django Software Foundation, an independent organization established as a 501 non profit. Django primary goal is to ease the creation of complex, database-driven websites.

2.2.2 User and Admin Panel

a) Python3 Programming language

b) Data Science Libraries:

a. MATPLOTLIB
   - Provides API for embedding plots into app.

b. PANDAS
   - Data manipulation and analysis. In particular, it offers data structures and operation for manipulating numerical tables and time series.

c. NETWORKX
   - Use to study graphs and networks. Networkx is free software release under the BSD-new license.

SYSTEM DESIGN

3.1 FLOW OF SYSTEM

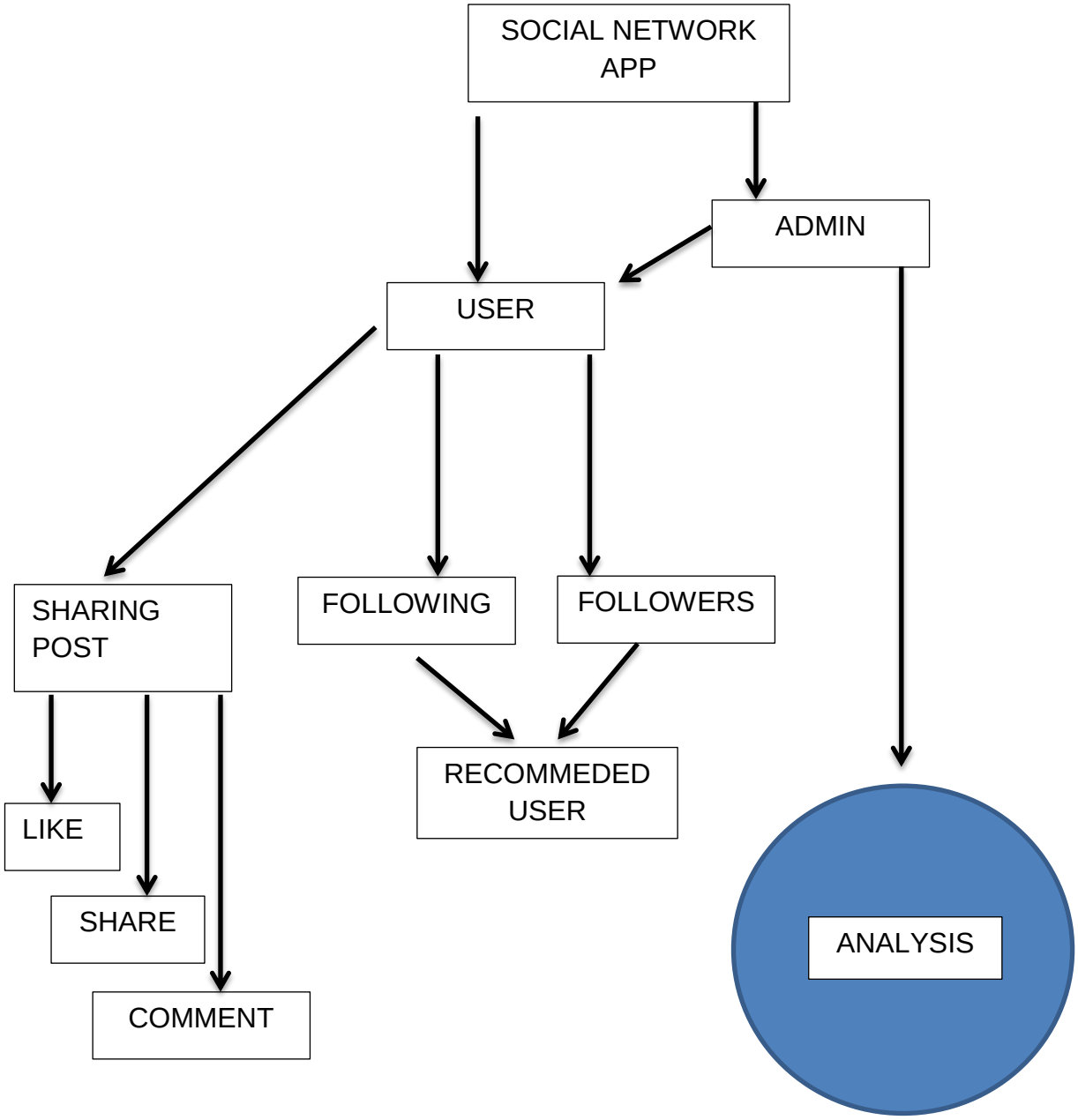


Fig. 3.1 Flow of System

3.2 ADMIN ANALYSIS

3.2.1 Finding connected components in the network.

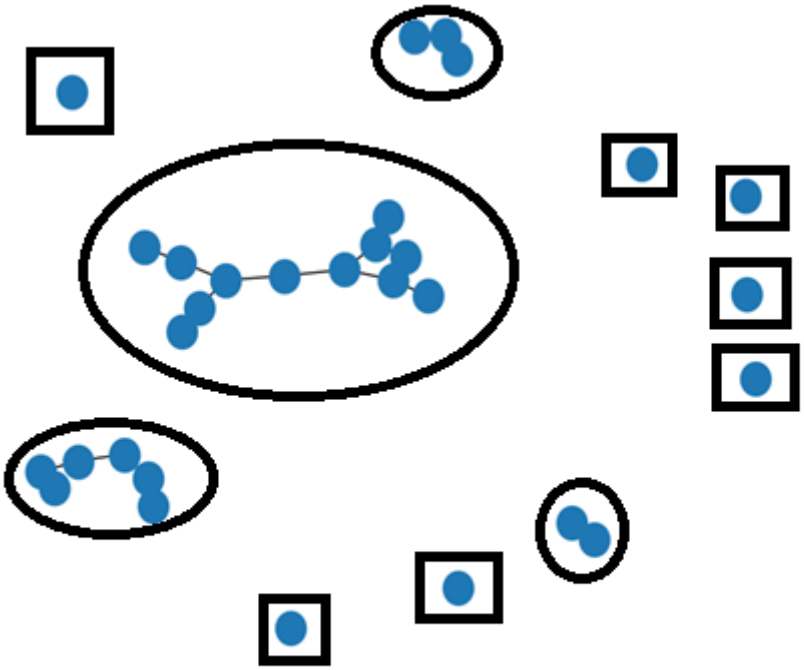


Fig 3.2 Components

There are the different component exist in the network at the same time there are some nodes that are totally alone in the network that means they are not belong to any community hence they are having no friends or following anybody in the network.

Circle denotes the Connected Component in the network.

Rectangle denotes the Single Node or Alone Node in the network.

3.2.2 Finding most valuable or famous nodes

a) This can be achieve by finding the highest degree from the node such that that user or connection having so many other connection such that he influence so many users in the network. Hence It can be a most valuable node in the class.

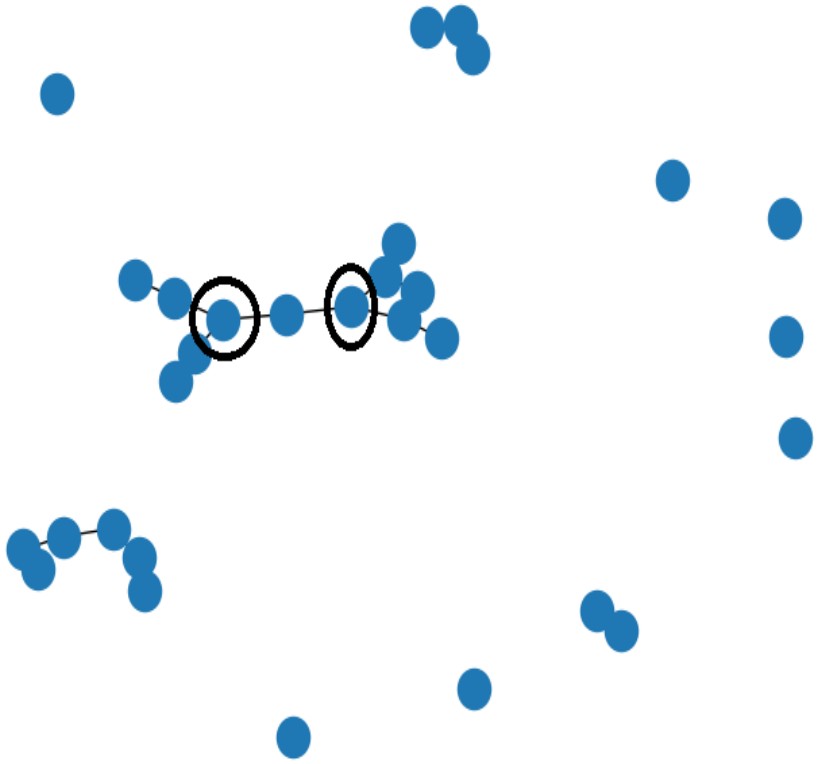


Fig. 3.3 High Degree Nodes

b) There are two nodes such that they are having highest degree with 3 hence they are most valuable nodes of the network.

c) Inferences:-

- That means that if someone attack on most valuable nodes then this will affect the most of the people in the networks. Hence we will have to prevent such attacks.

- By deleting this node this will lead to disconnected graphs.

- Viral Marketing.

Generally we can use these nodes because they are having high degree such that we can target this node to achieve viral marketing.

This will help us to spread the product idea among the network quickly. Hence instead of targeting each and every node we can target to such node such that with maximum probability product idea will reach to as many people in the network.

3.2.3 Finding Bridges and Articulation points in the network.

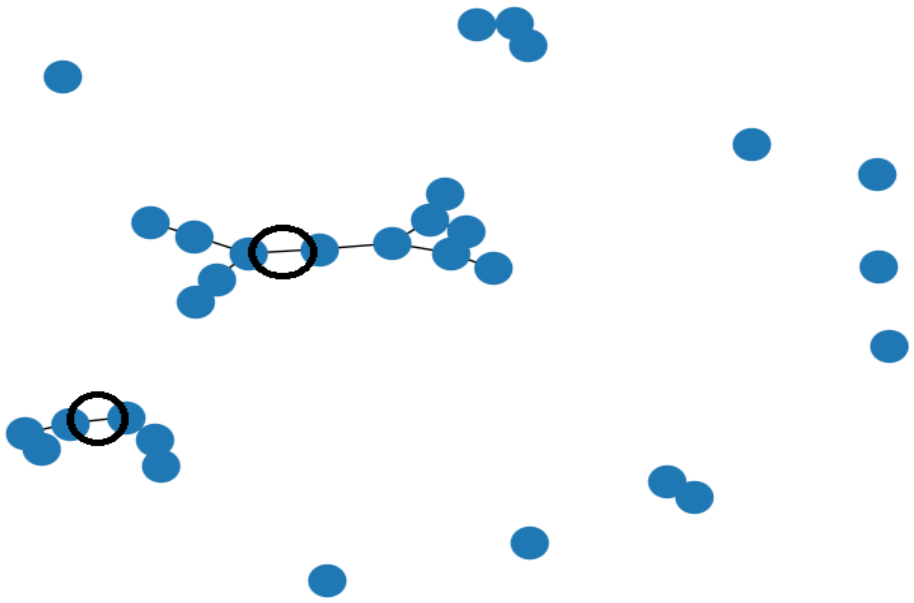


Fig 3.4 Bridges

a) There are some edges exist in the network such by attacking that node the network become disconnected.
We need to prevent such relationship in the network to sustain the state of connectedness.

Hence these edges are known as bridges or cut edges in graph theory.

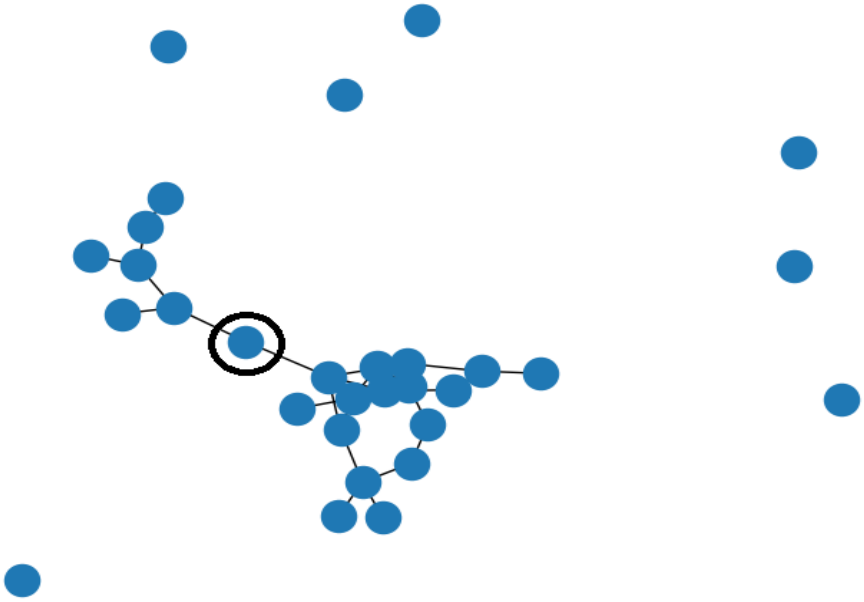


Fig. 3.5 Articulation Points

b) Here this node is considered as articulation points such that after deleting this node the graph is become disconnected.

3.2.4 Degree distribution analysis on the graphs.

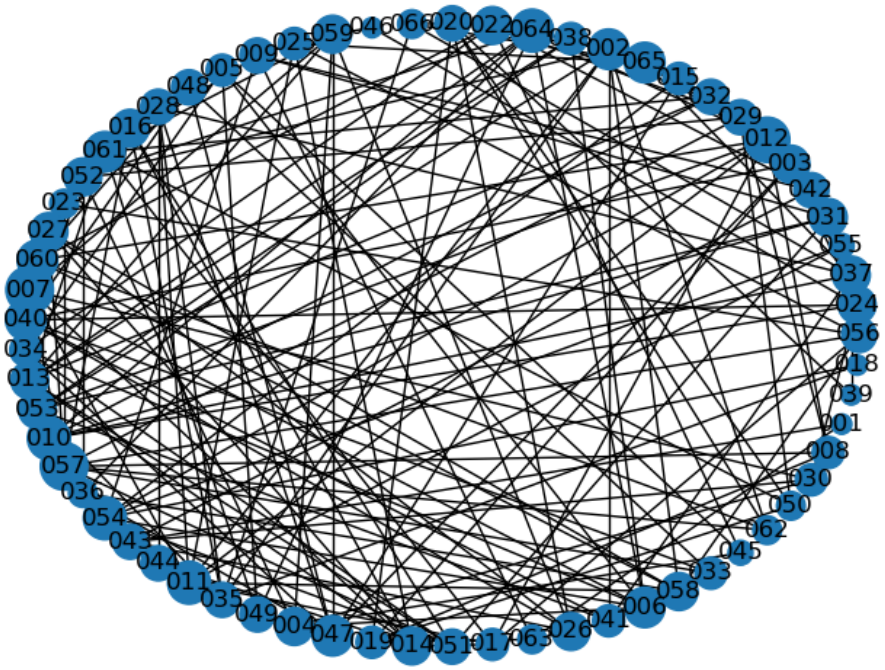


Fig 3.6 Circular layout of Social Network

a) Degree distribution analysis of the above graph of 70 users

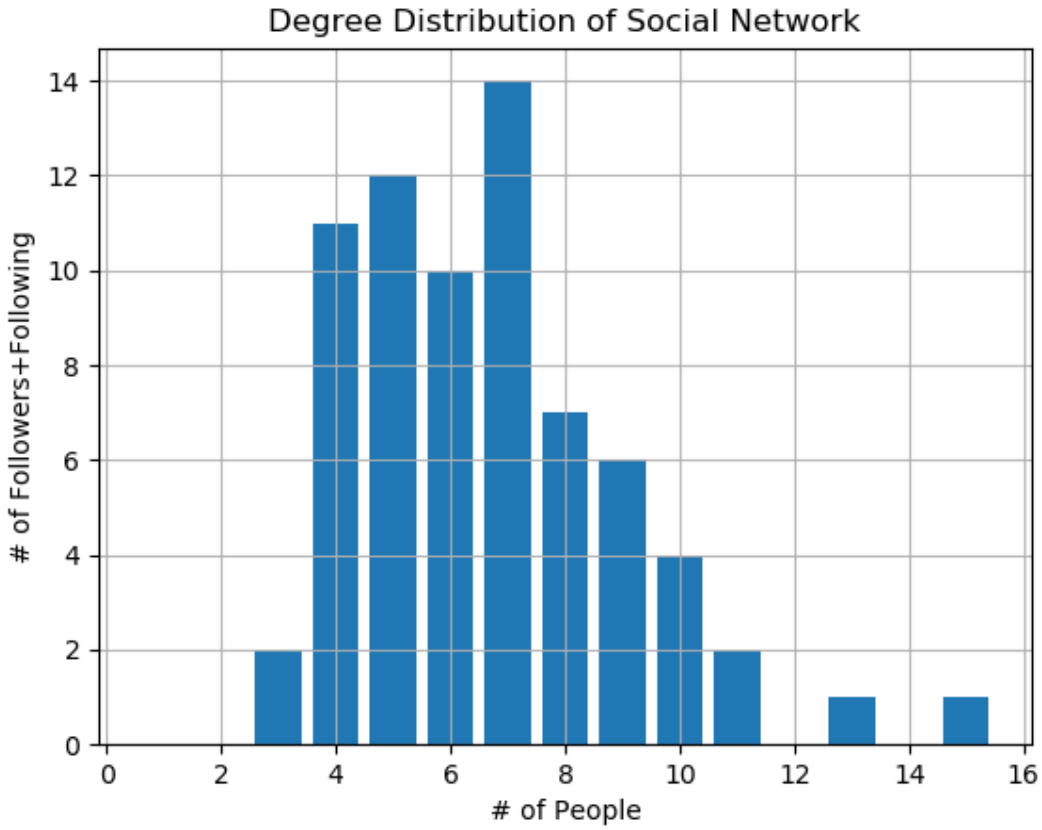


Fig. 3.7 Degree Histogram

3.2.5 Finding whether a meme go viral or not?

a) Virality of the meme is not a one day task, this is the observation base analysis where minimum five days of activity on that meme we recorded then check whether this meme going to become viral or not?
b) But this task is not so simple, let say we are having a meme now we have to take track of last five days likes, dislikes and shares.
c) And # of Shares is directly proportional to # of Likes/Dislikes
d) Hence we will keep track of last five days likes counter on a particular meme and observe the plot of that graph if it showing an exponential growth then with very high probability that meme is going to be viral in upcoming days or hours.

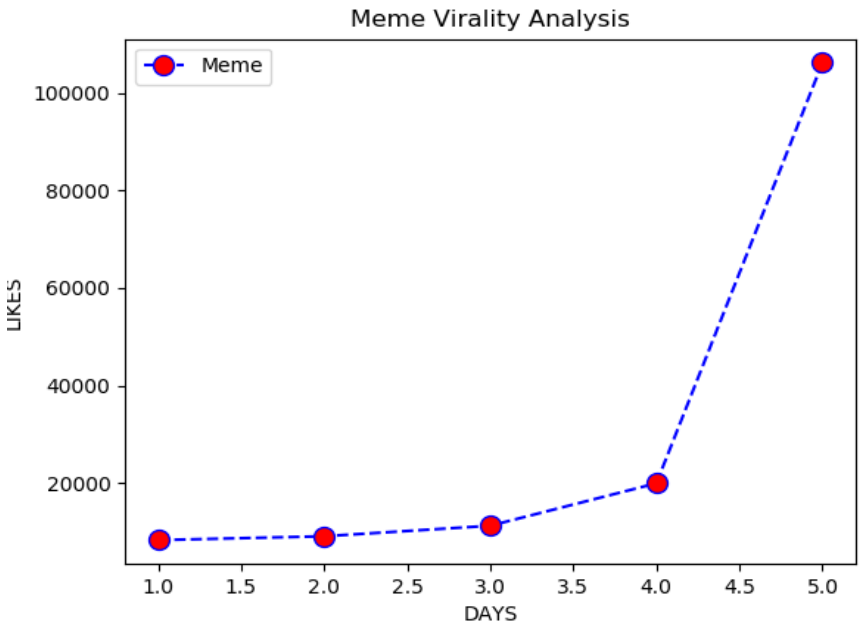


Fig 3.8 Trend line Viral Meme

e) Here we observe that the growth of likes per day is increasing exponentially, as the growth is increasing very rapidly

3.3 DATA DICTIONARY (TABLE & RELATIONSHIP)/DIAGRAM

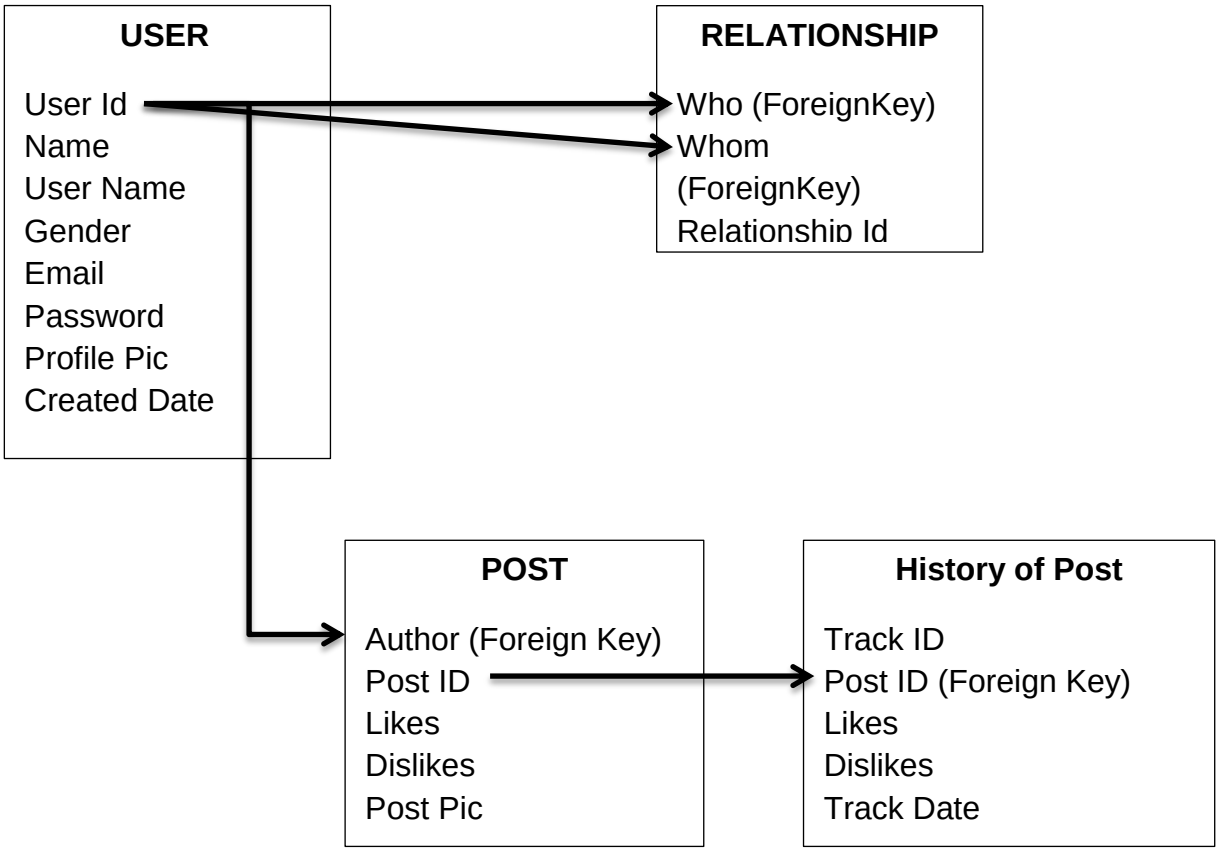


Fig. 3.9 Data Dictionary

IMPLEMENTATION

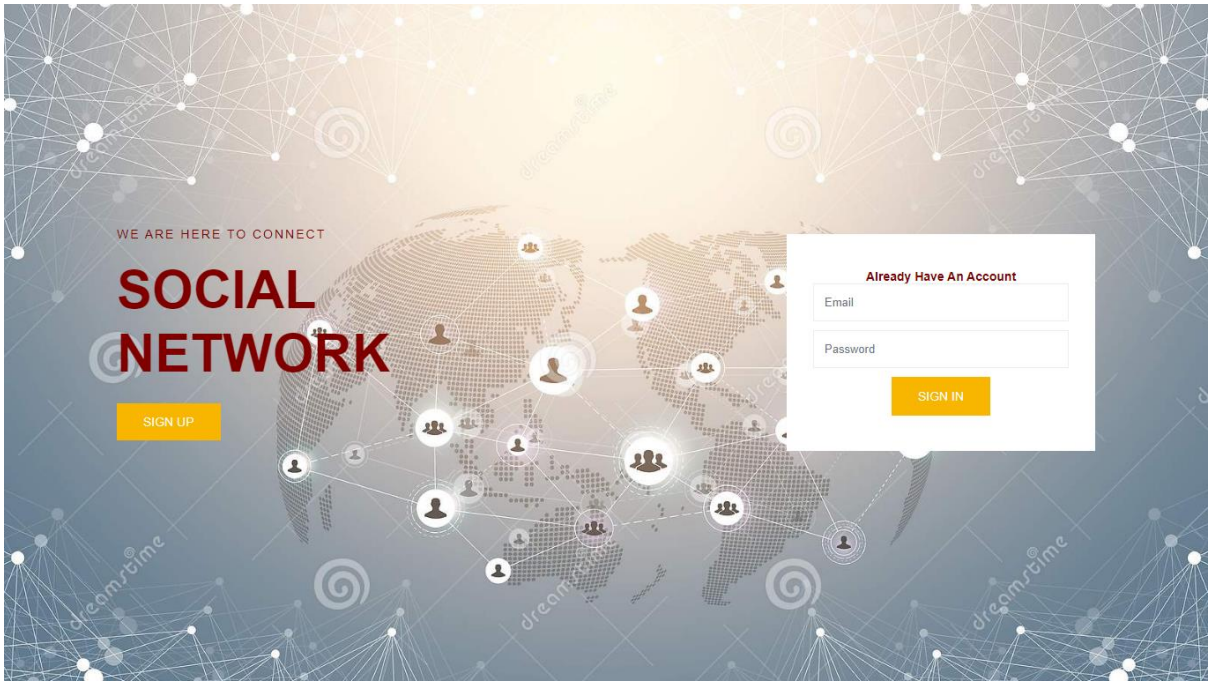
4.1 CODING STANDARD

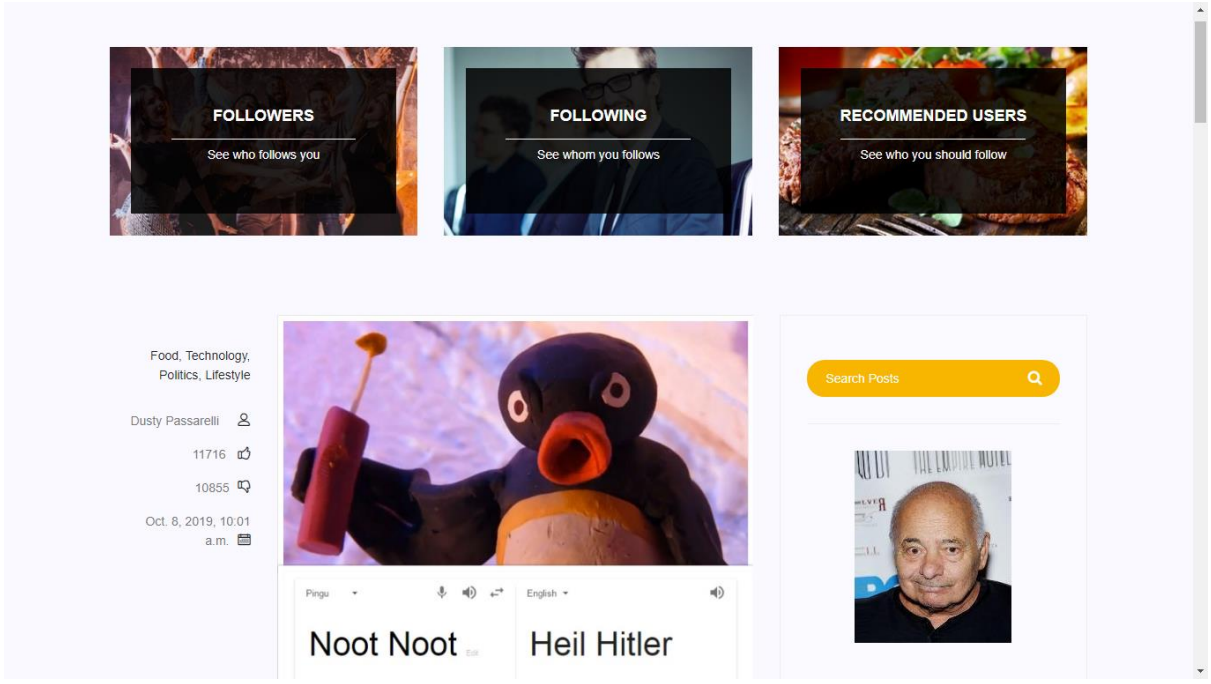
4.1.Social Network Web-App (Social Network Databases Classes)

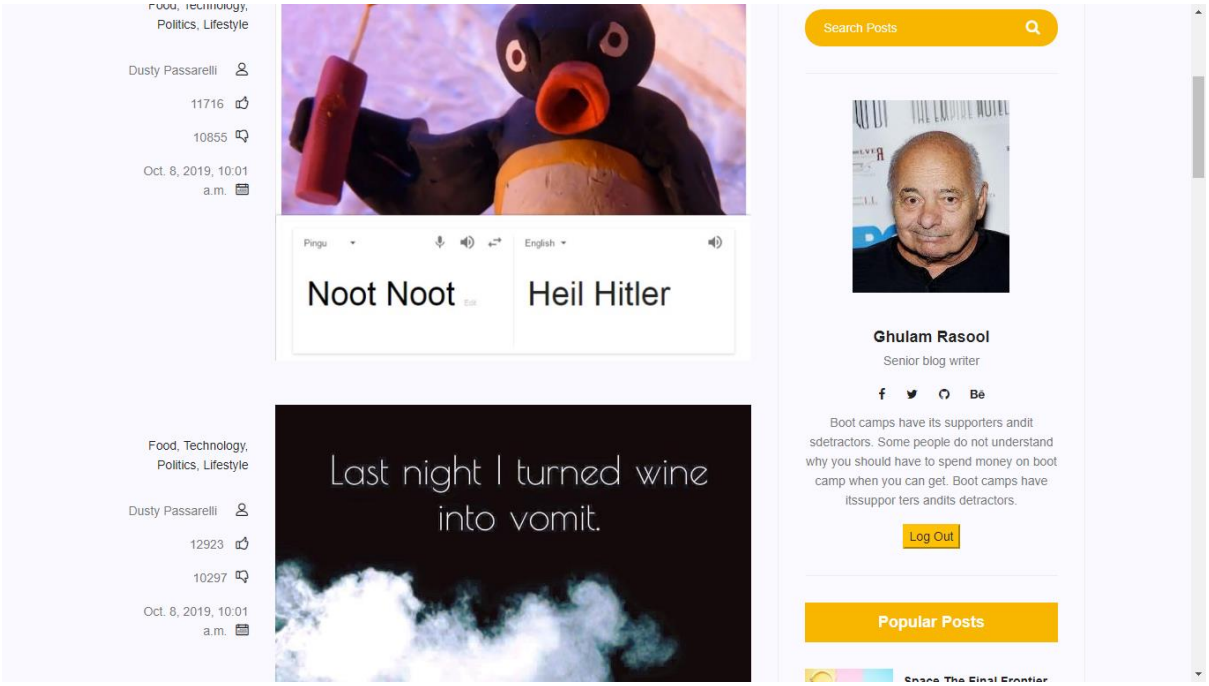
```
from django.db import models
import random

class Tweeter(models.Model):
    user = models.ManyToManyField('self',symmetrical=False, through='Relationship')
    name = models.CharField(default='',max_length=30)
    user_name = models.CharField(default='',max_length=30)
    GENDER_CHOICES = (('M','Male'),('F','Female'),('O','Other'))
    gender = models.CharField(default='M',max_length=1,choices=GENDER_CHOICES)
    email = models.CharField(default='',max_length=100)
    password = models.CharField(default='',max_length=100)
    profile_pic_path = models.CharField(default='img.jpg',max_length=30)
    created_date = models.DateTimeField(auto_now_add=True, blank=True)

class Relationship(models.Model):
    who = models.ForeignKey(Tweeter,on_delete=models.CASCADE, related_name="who")
    whom = models.ForeignKey(Tweeter,on_delete=models.CASCADE, related_name="whom")
    friendship_date = models.DateTimeField(auto_now_add=True, blank=True)

class Post(models.Model):
    who = models.ForeignKey(Tweeter,on_delete=models.CASCADE,related_name="author")
    likes = models.IntegerField(default=0)
    dislikes = models.IntegerField(default=0)
    file_name = models.CharField(default='',max_length=100)
    published_date = models.DateTimeField(auto_now_add=True, blank=True)


class HistoryOfPost(models.Model):
    post = models.ForeignKey(Post, on_delete=models.CASCADE, related_name="post")
    likes = models.IntegerField(default=0)
    dislikes = models.IntegerField(default=0)
    track_day = models.IntegerField(default=0)
```

4.2 SNAPSHOTS OF PROJECT

4.2.1 Social Network Web-App






Food, Technology, Politics, Lifestyle
Dusty Passarelli
11716
10855
Oct. 8, 2019, 10:01 a.m.
Pingu
English
Noot Noot
Heil Hitler
Food, Technology, Politics, Lifestyle
Dusty Passarelli
12923
10297
Oct. 8, 2019, 10:01 a.m.
Last night I turned wine into vomit.
Search Posts
Ghulam Rasool
Senior blog writer
Boot camps have its supporters andit sdetractors. Some people do not understand why you should have to spend money on boot camp when you can get. Boot camps have itssuppor ters andits detractors.
Log Out
Popular Posts

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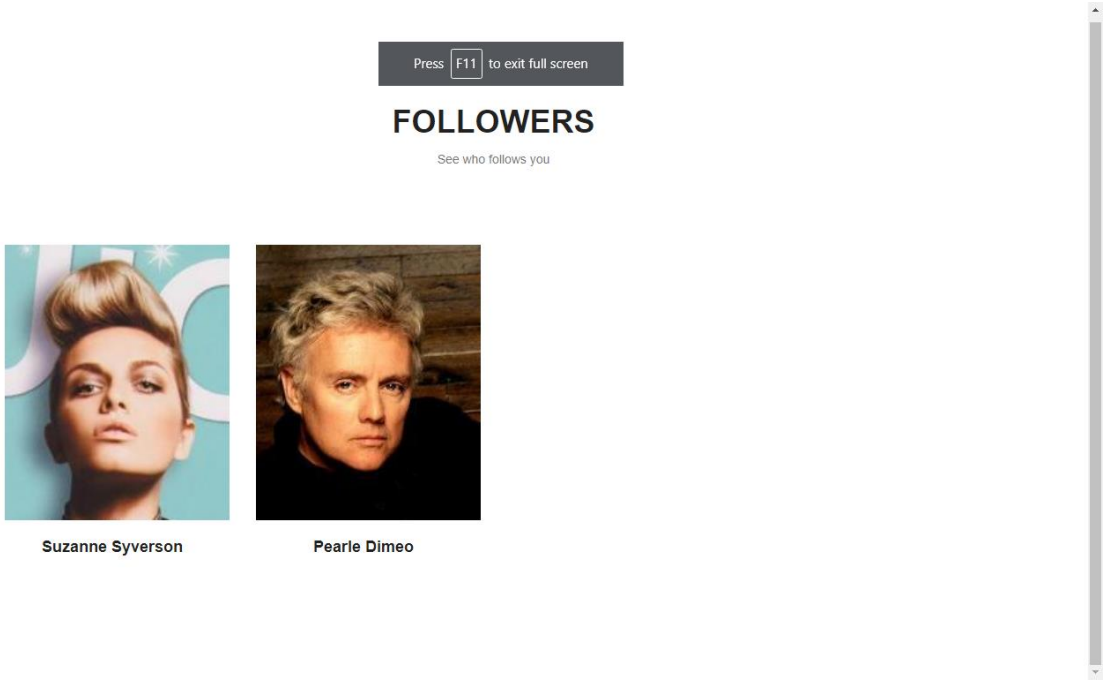

Press F11 to exit full screen
FOLLOWERS
See who follows you
Suzanne Syverson
Pearle Dimeo

FOLLOWING

See whom you follows

Dusty Passarelli

UnFollow

RECOMMENDED USERS

See who you should follows

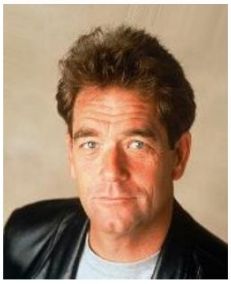
Followers of my Followers is my Followers !!

Daphine Lynn

Follow

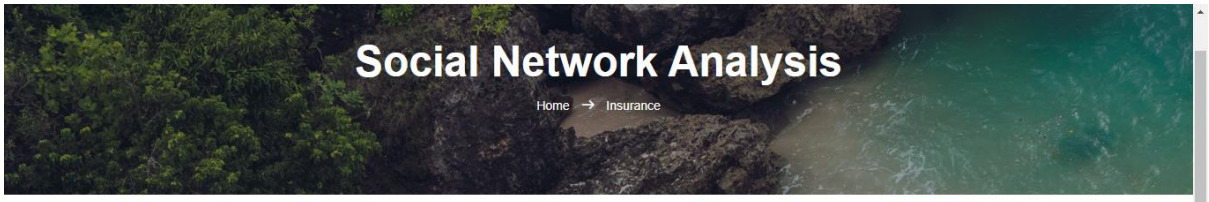
Heri Sigu Samboja

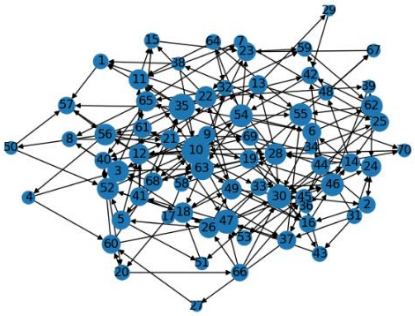
Follow



Amir

Follow





NEED TO KNOW

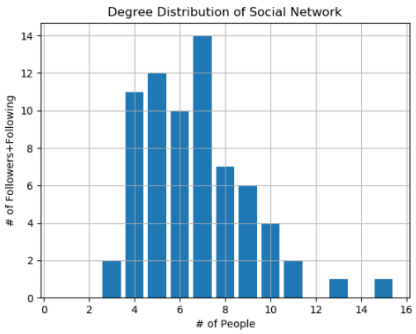
Network Graph

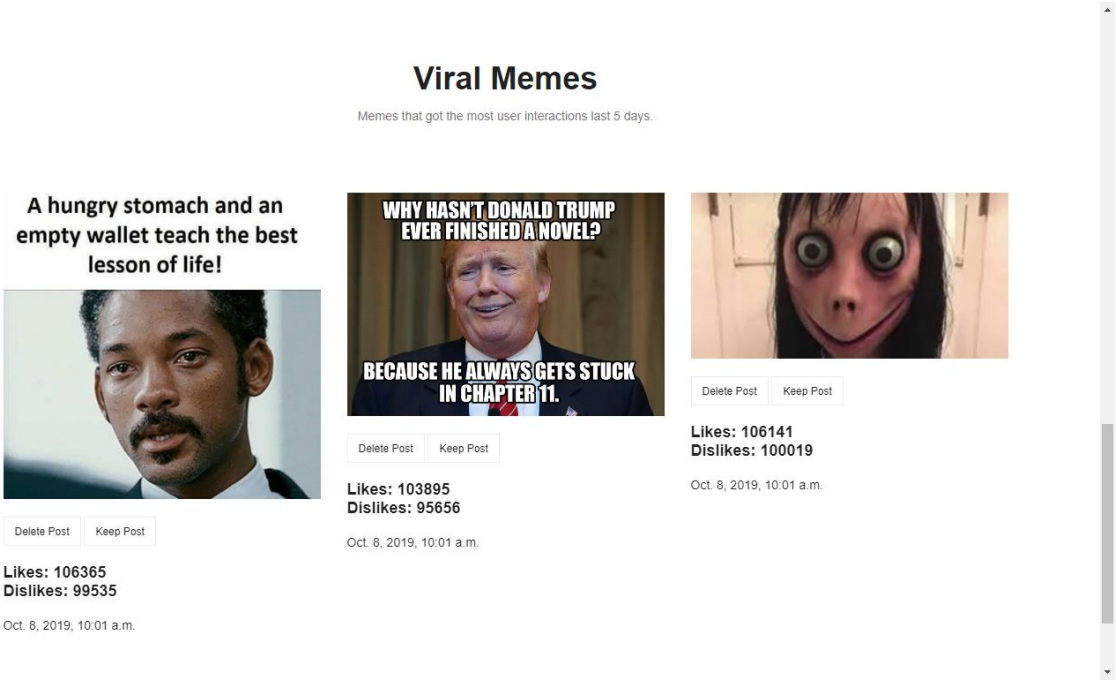
No of nodes:- 70

No of groups:- 2

NEED TO KNOW

Degree Histogram of Followers+Following vs No of people.




Viral Memes
Memes that got the most user interactions last 5 days.
A hungry stomach and an empty wallet teach the best lesson of life!
Delete Post
Keep Post
Likes: 106365
Dislikes: 99535
Oct. 8, 2019, 10:01 a.m.
WHY HASN'T DONALD TRUMP EVER FINISHED A NOVEL?
BECAUSE HE ALWAYS GETS STUCK IN CHAPTER 11.
Delete Post
Keep Post
Likes: 103895
Dislikes: 95656
Oct. 8, 2019, 10:01 a.m.
Delete Post
Keep Post
Likes: 106141
Dislikes: 100019
Oct. 8, 2019, 10:01 a.m.

CONSTRAINTS AND FUTURE ENHANCEMENT

Social Networking Apps now a days having great response from the user, as we all know the six degree separation rule where in real life world any two people are just separated by an average of only 6 people.

This dense connectivity of real world networks having its own benefits at the same time having its own disadvantage. We need to focus on both sides, such that we can maintain this connectivity with total security.

This app provides a way to think for large constraints and how we will deal with loop holes and problems when we think in term of large networks.

This app giving sufficient analysis with every aspect such that it will show why this product or app should exist.

Now a day we really need to think from analytical side also and provide a sufficient result and prediction to the authorities for better judgments and updates.

CONCLUSION

When we are talking about large networks, security and data analysis is most important thing to make the product more better such that it will reach to all users conveniently, viral marketing techniques as people targeting famous nodes to advertise there product with only belief that it will reach to most of the users.

This app will solve the real world problems like deciding which node to pick for viral marketing, which node or edges are only common link between two communities called bridges or articulation point, virality of meme or a post prediction to analyses either a meme is good for end user or not.

REFERENCES

i) Social Network Analysis (NPTEL)
ii) https://kaggle.com/datasets?search=facebook
iii) https://snap.stanford.edu/data/
iv) http://snap.stanford.edu/
v) https://nptel.ac.in/courses/106106169/