

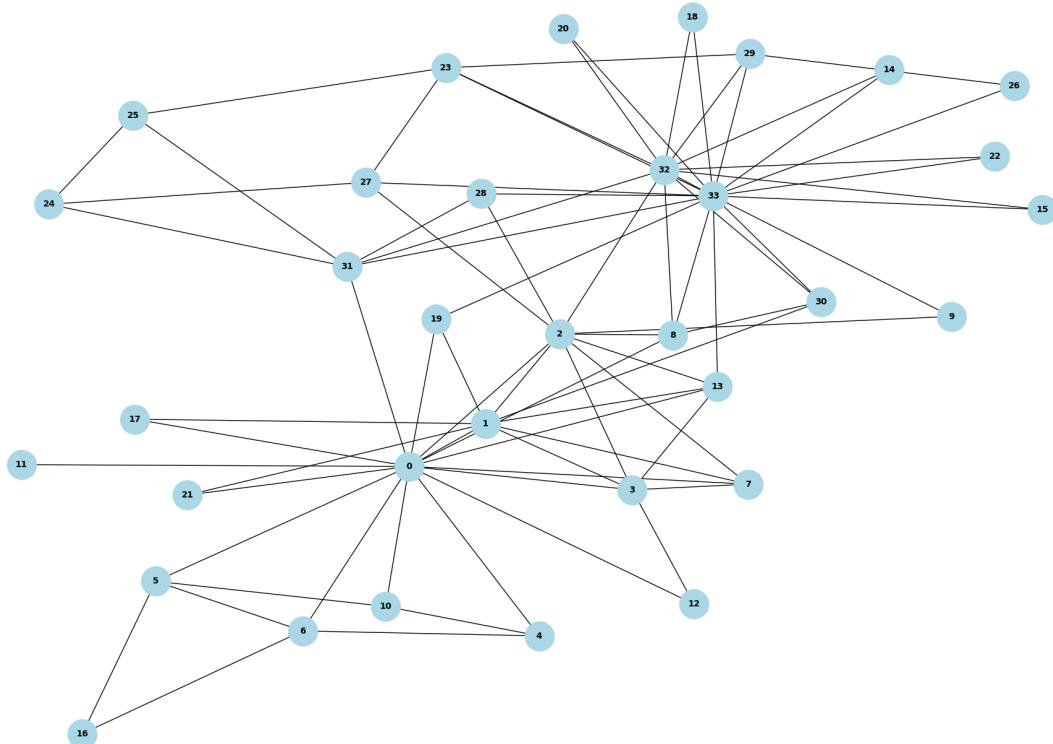
Activity-1

- Siddhi Patil (018185102)
- Rudraksh Naik (018173285)

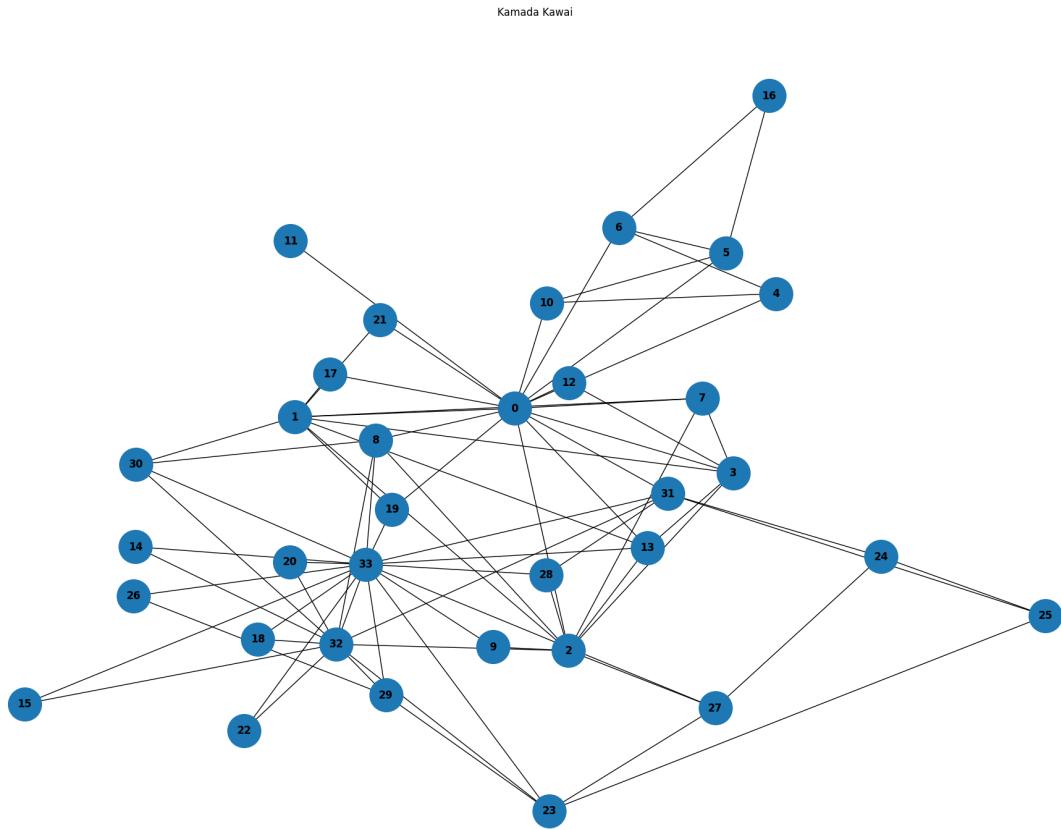
Link to Code - [Activity1_GenshinImpact.ipynb](#)

Karate Club Graph

Undirected Karate Club Graph

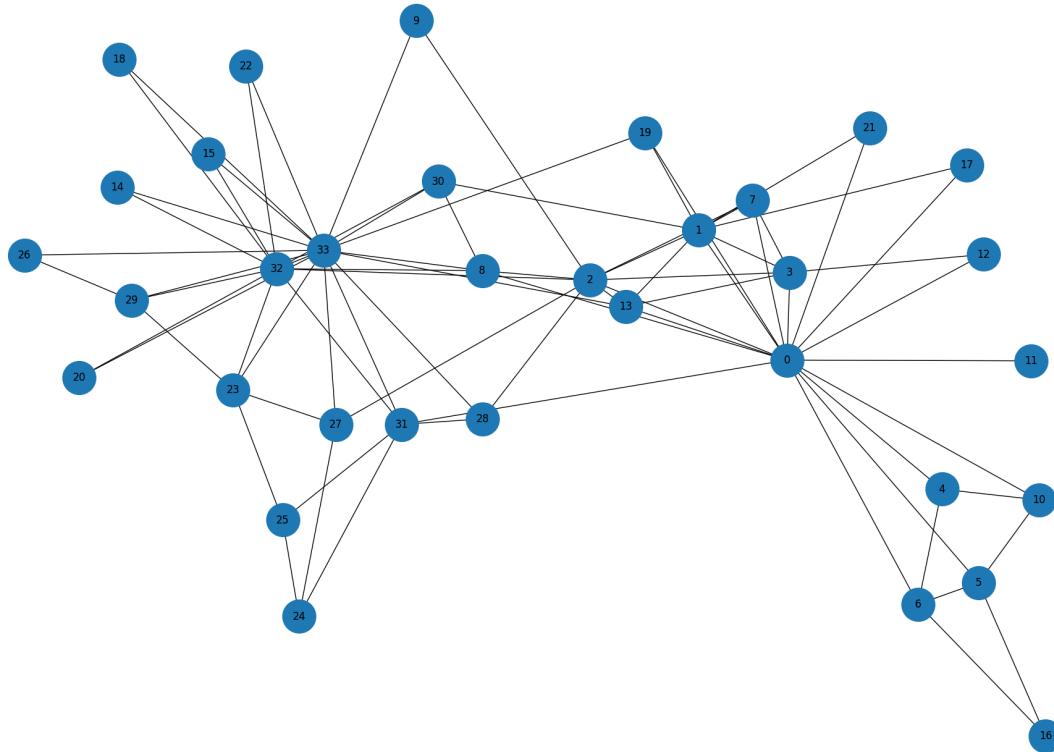


Kamada Kawai

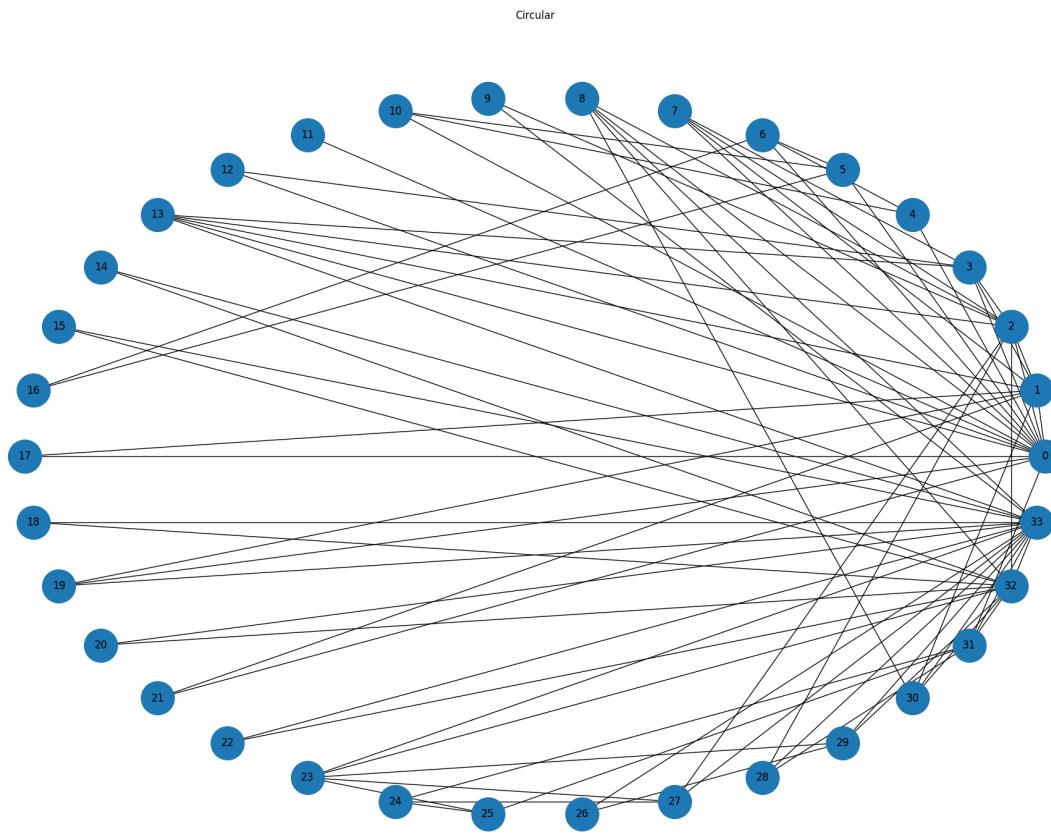


Fruchterman Reingold

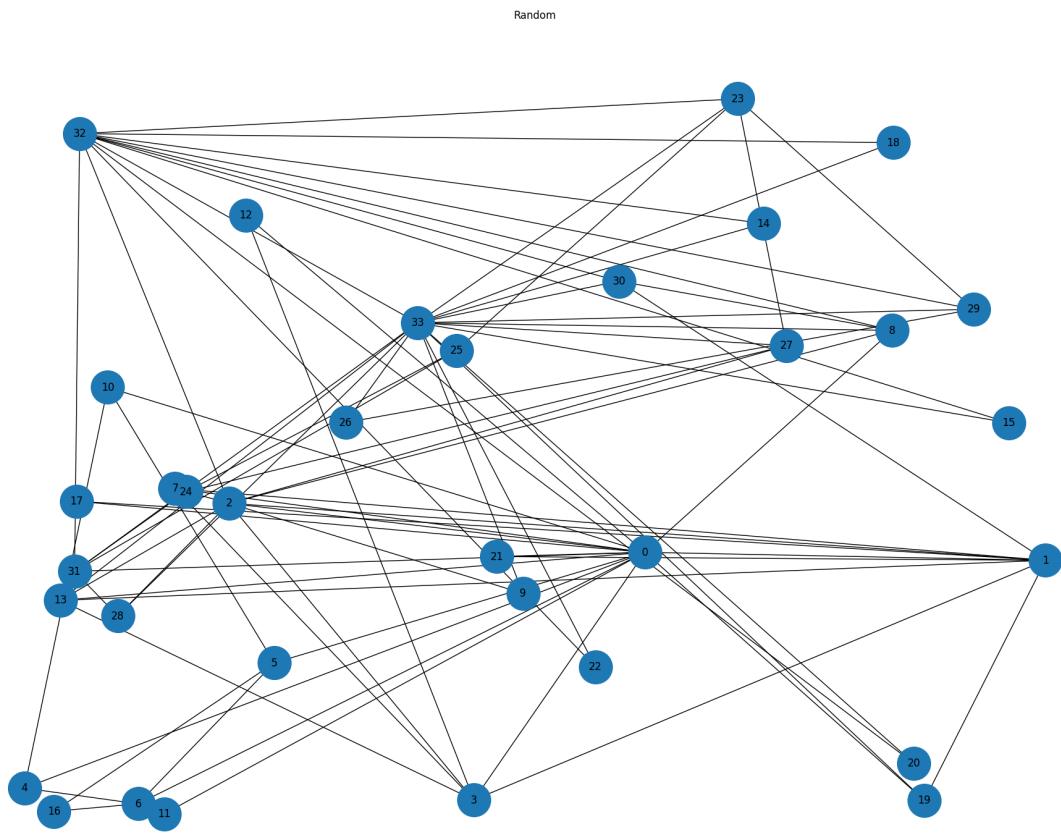
Fruchterman reingold



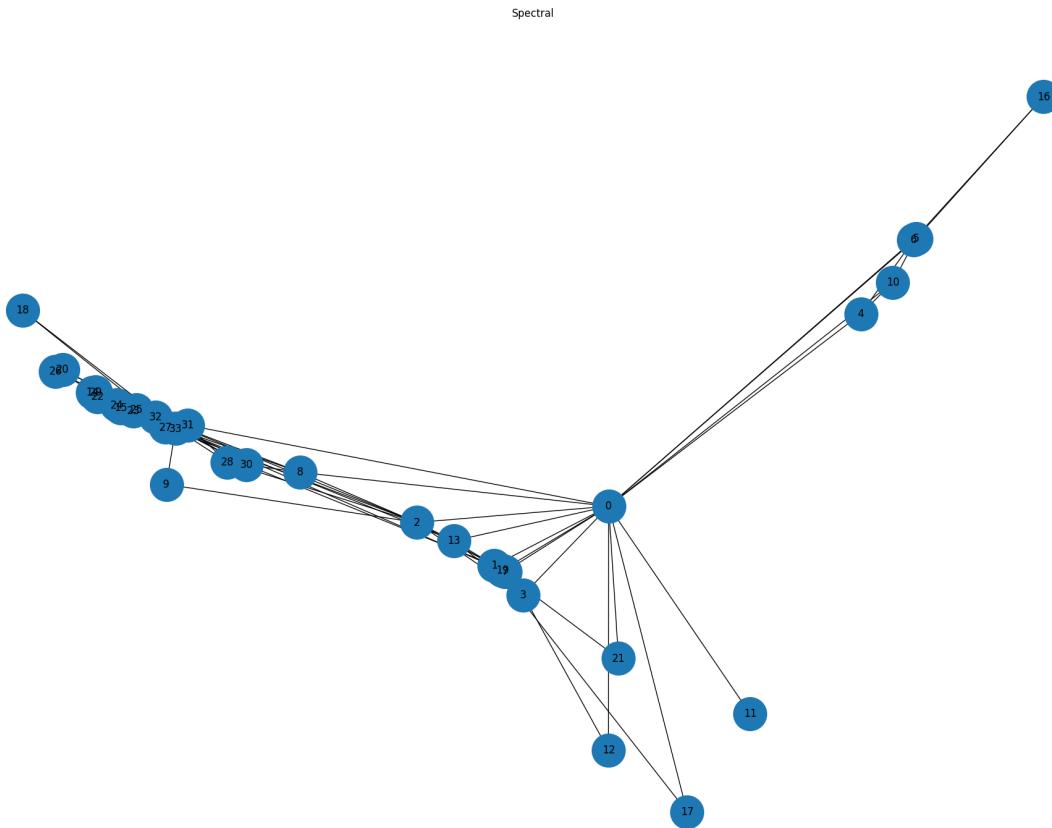
Circular



Random

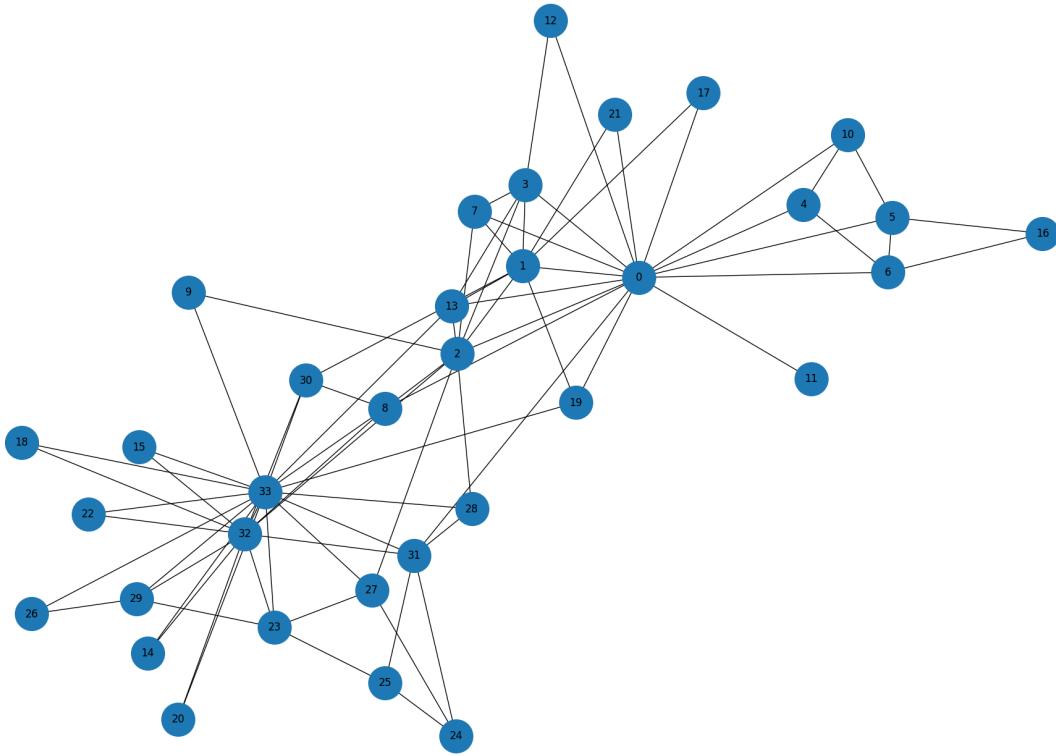


Spectral

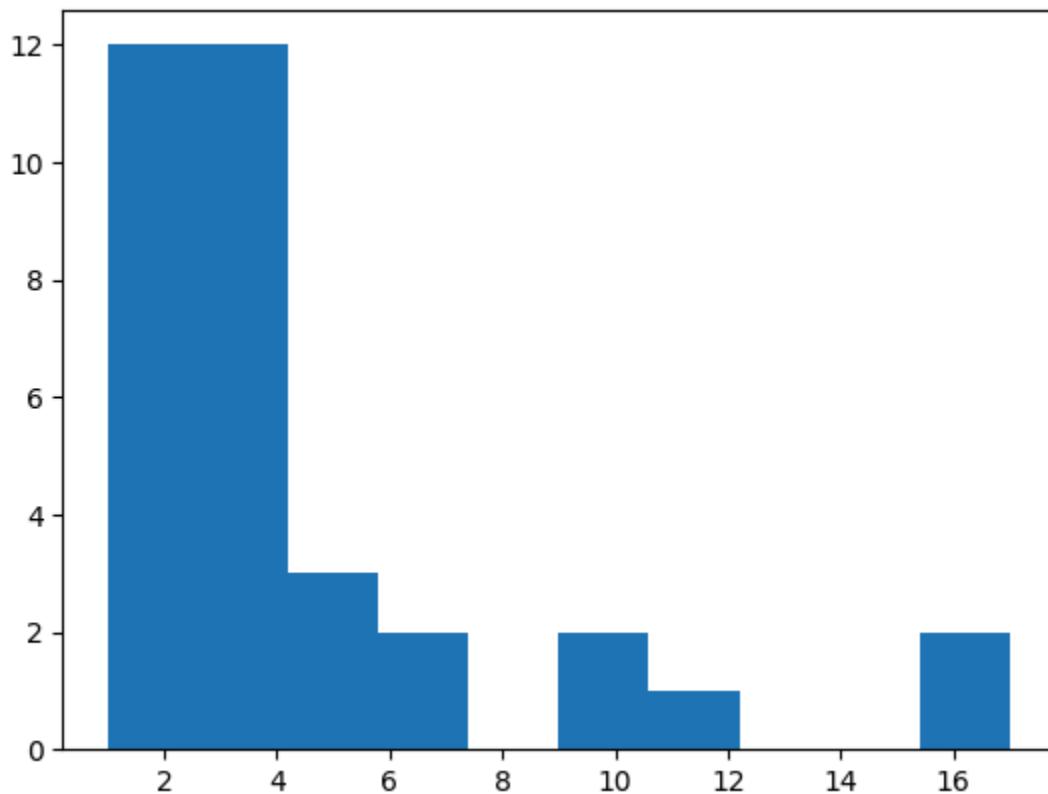


Spring

Spring Layout



Degree Plot for Undirected Graph



Clustering Coefficient

Character	Clustering_coeff
0	0.15
1	0.333
2	0.244
3	0.667
4	0.667
5	0.5
6	0.5
7	1
8	0.5
9	0
10	0.667

11	0
12	1
13	0.6
14	1
15	1
16	1
17	1
18	1
19	0.333
20	1
21	1
22	1
23	0.4
24	0.333
25	0.333
26	1
27	0.167
28	0.333
29	0.667
30	0.5
31	0.2
32	0.197
33	0.11

Centrality Measures

Degree Centrality

Character	Degree Centrality
0	0.485
1	0.273
2	0.303
3	0.182

4	0.091
5	0.121
6	0.121
7	0.121
8	0.152
9	0.061
10	0.091
11	0.03
12	0.061
13	0.152
14	0.061
15	0.061
16	0.061
17	0.061
18	0.061
19	0.091
20	0.061
21	0.061
22	0.061
23	0.152
24	0.091
25	0.091
26	0.061
27	0.121
28	0.091
29	0.121
30	0.121
31	0.182
32	0.364
33	0.515

Closeness Centrality

Character	Closeness Centrality
0	0.569
1	0.485
2	0.559

3	0.465
4	0.379
5	0.384
6	0.384
7	0.44
8	0.516
9	0.434
10	0.379
11	0.367
12	0.371
13	0.516
14	0.371
15	0.371
16	0.284
17	0.375
18	0.371
19	0.5
20	0.371
21	0.375
22	0.371
23	0.393
24	0.375
25	0.375
26	0.363
27	0.458
28	0.452
29	0.384
30	0.458
31	0.541
32	0.516
33	0.55

Betweenness Centrality

Character	Betweenness Centrality
-----------	------------------------

0	0.438
1	0.054
2	0.144
3	0.012
4	0.001
5	0.03
6	0.03
7	0
8	0.056
9	0.001
10	0.001
11	0
12	0
13	0.046
14	0
15	0
16	0
17	0
18	0
19	0.032
20	0
21	0
22	0
23	0.018
24	0.002
25	0.004
26	0
27	0.022
28	0.002
29	0.003
30	0.014
31	0.138
32	0.145
33	0.304

Eigenvector Centrality

Character	Eigenvector Centrality
0	0.355
1	0.266
2	0.317
3	0.211
4	0.076
5	0.079
6	0.079
7	0.171
8	0.227
9	0.103
10	0.076
11	0.053
12	0.084
13	0.226
14	0.101
15	0.101
16	0.024
17	0.092
18	0.101
19	0.148
20	0.101
21	0.092
22	0.101
23	0.15
24	0.057
25	0.059
26	0.076
27	0.133
28	0.131
29	0.135
30	0.175
31	0.191
32	0.309
33	0.373

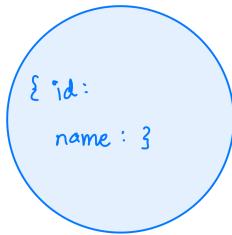
Katz Centrality

Character	Katz Centrality
0	0.258
1	0.205
2	0.217
3	0.183
4	0.153
5	0.16
6	0.16
7	0.167
8	0.181
9	0.148
10	0.153
11	0.137
12	0.146
13	0.18
14	0.149
15	0.149
16	0.14
17	0.147
18	0.149
19	0.16
20	0.149
21	0.147
22	0.149
23	0.173
24	0.149
25	0.15
26	0.146
27	0.164
28	0.157
29	0.165
30	0.168
31	0.184
32	0.228
33	0.263

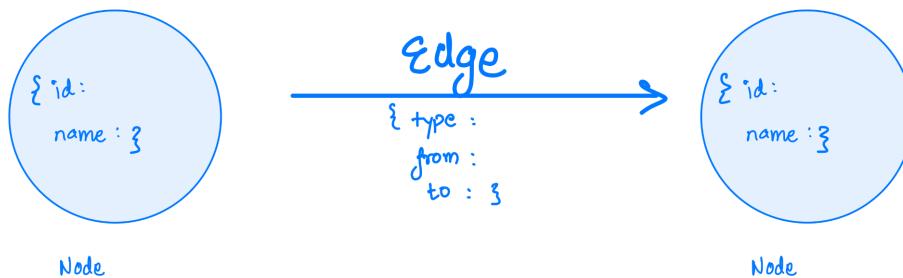
Genshin Impact Graph

Dataset Background :

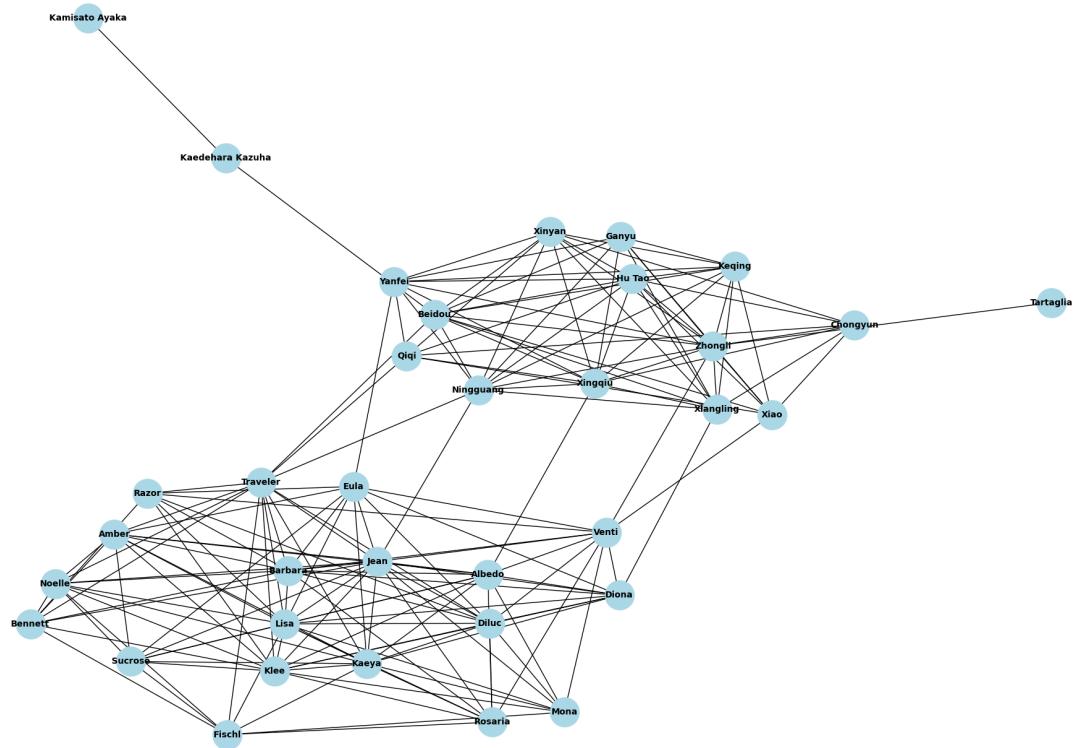
- For this activity, we analyzed the relationships between the playable characters in the Genshin Impact character story and voice mention network.
- Genshin Impact is a story-based role-playing game with an action-based [battle system](#) using elemental [magic](#) and character-switching.
- The dataset is in the form of two .json files. A node_list.json file for the characters and an edge_list.json for their relationships.
- Each entry in the node_list.json file has two attributes: id and nation. The id contains the name of the character while nation indicates the region a character belongs to.



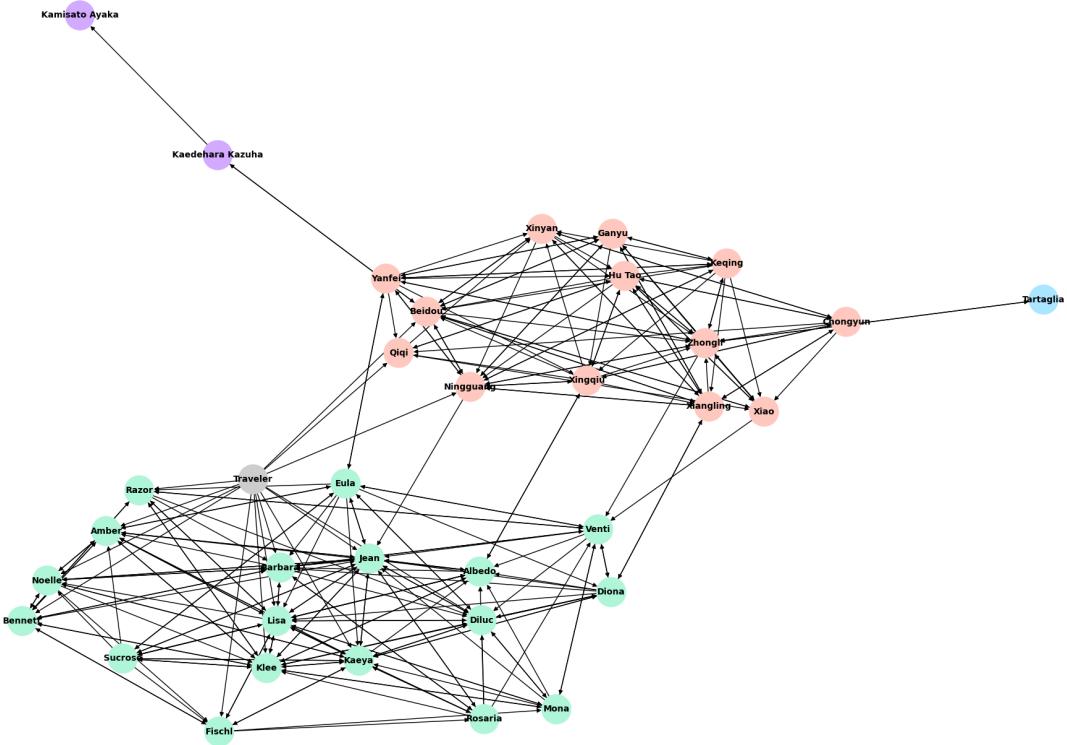
- Each entry in the edge_list.json file has three attributes: type, from and to. The type attribute indicates whether a character mentioned the other in story or in a voice line. The from and to attributes indicate the relationship between the characters A and B.



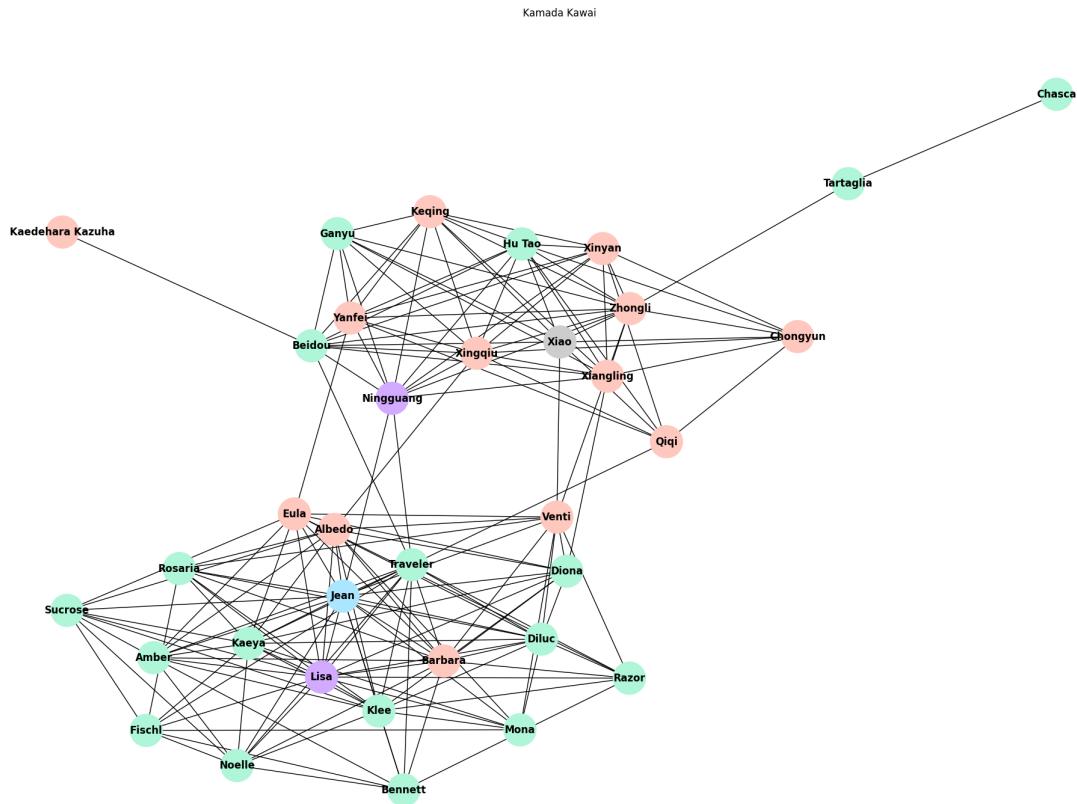
Undirected Genshin Impact Graph:



Directed Graph:

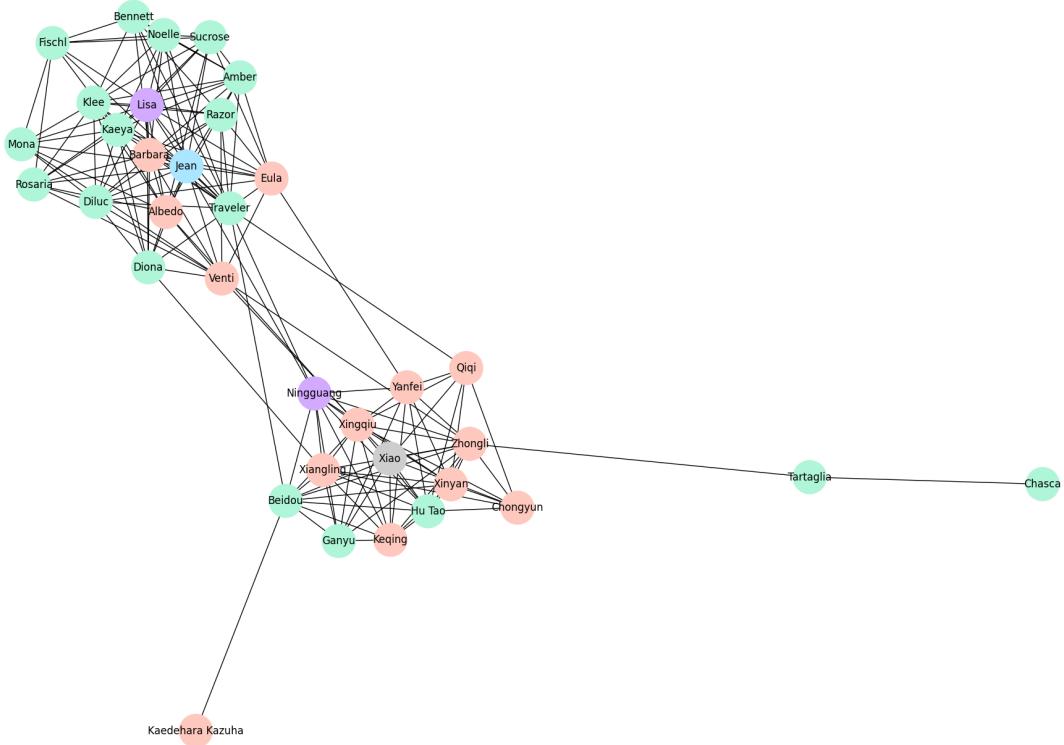


Kamada Kawai:

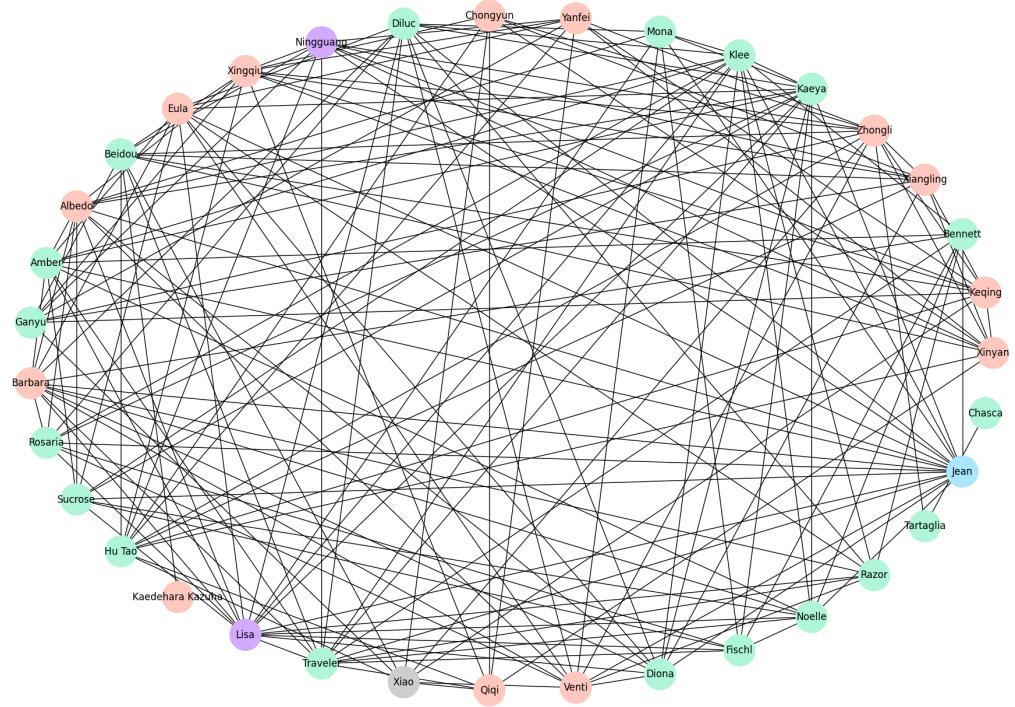


Fruchterman Reingold:

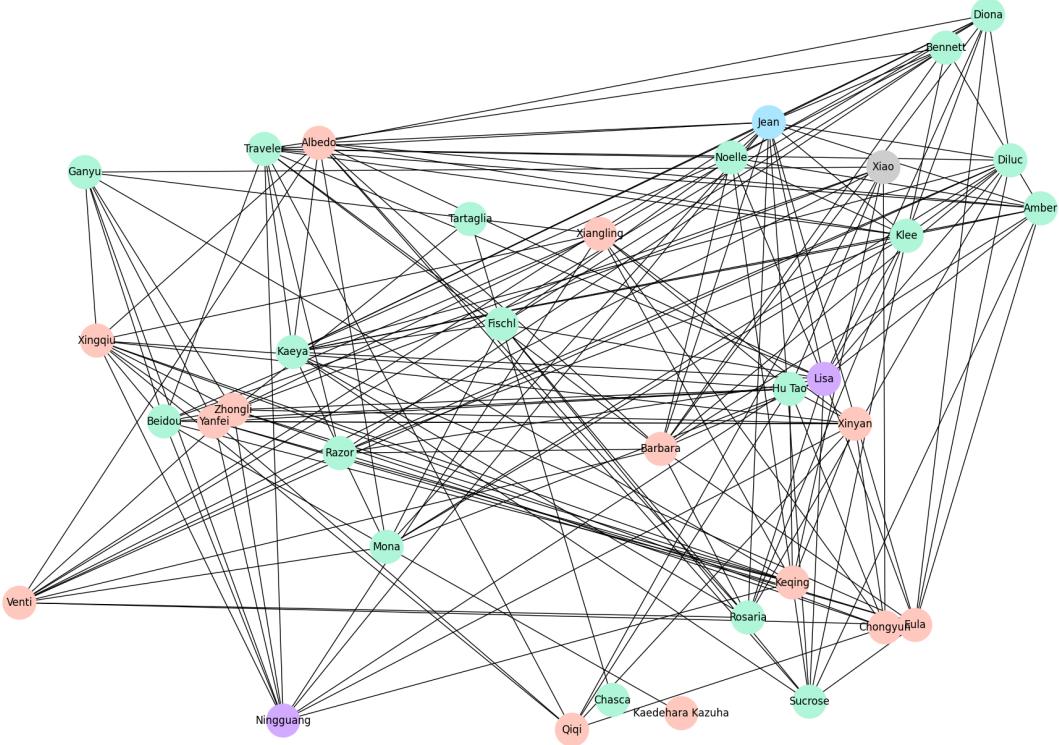
Fruchterman reingold



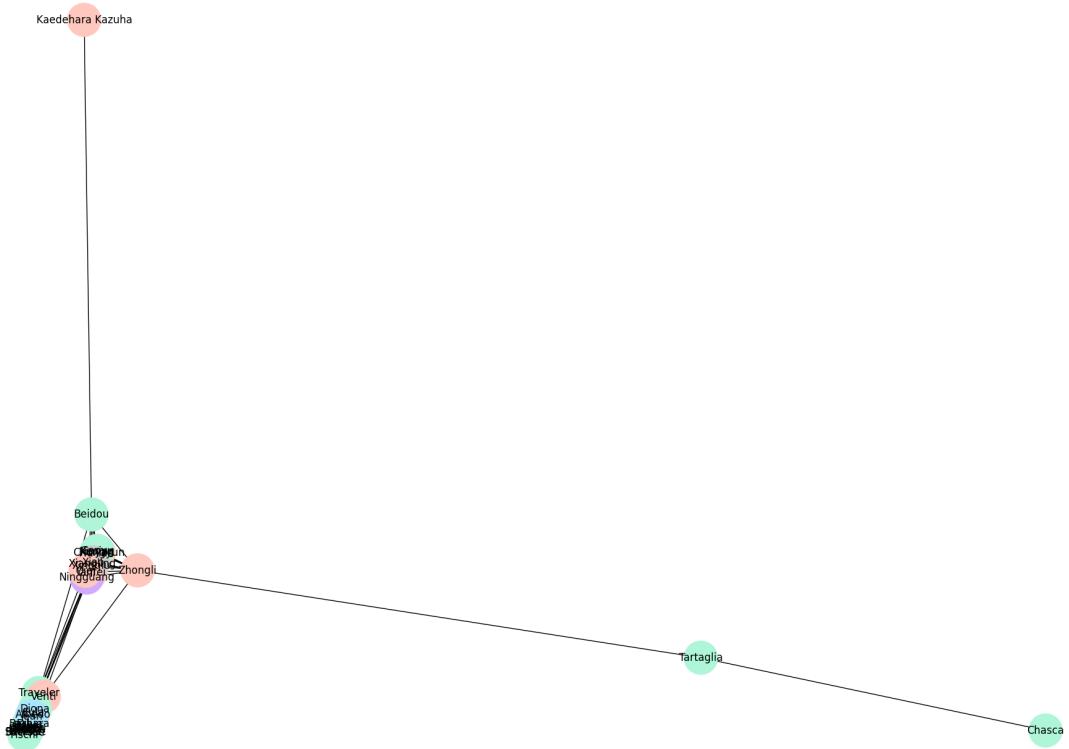
Circular:



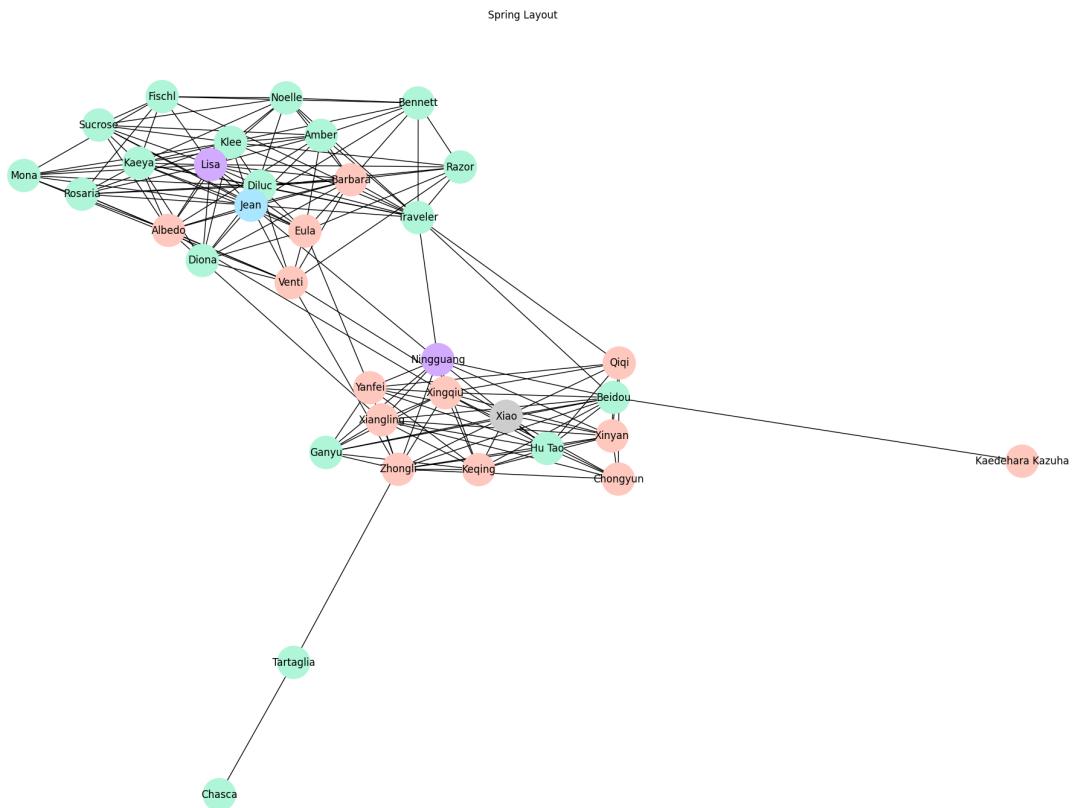
Random:



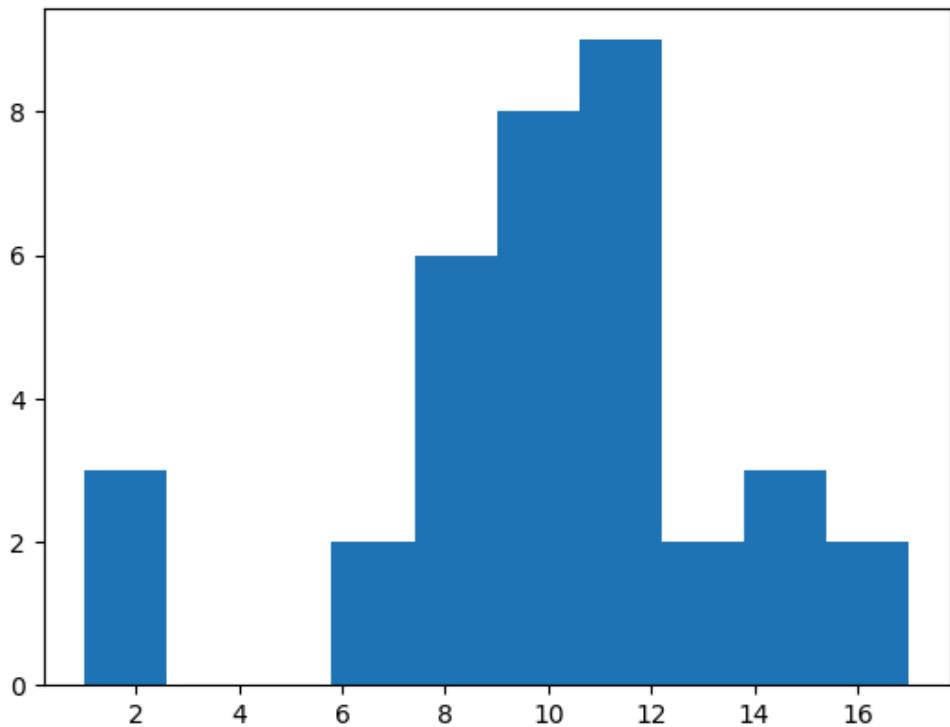
Spectral:



Spring:



Degree Plot for Undirected Graph:



Clustering Coefficient

	Character	Clustering_coeff
1	Keqing	0.8
17	Ganyu	0.786
9	Chongyun	0.762
0	Xinyan	0.756
30	Noelle	0.756
20	Sucrose	0.75
16	Amber	0.727
21	Hu Tao	0.709
2	Bennett	0.679
7	Mona	0.679
3	Xiangling	0.667
10	Diluc	0.667
19	Rosaria	0.667

31	Razor	0.643
28	Diona	0.622
11	Ningguang	0.618
5	Kaeya	0.615
8	Yanfei	0.611
12	Xingqiu	0.606
23	Lisa	0.583
18	Barbara	0.577
6	Klee	0.571
14	Beidou	0.564
15	Albedo	0.561
13	Eula	0.545
4	Zhongli	0.538
29	Fischl	0.536
33	Jean	0.529
26	Qiqi	0.524
25	Xiao	0.5
24	Traveler	0.44
27	Venti	0.436
22	Kaedehara Kazuha	0.0
32	Tartaglia	0.0
34	Chasca	0.0

Centrality Measures

1. Degree Centrality:

	Character	Degree Centrality
22	Kaedehara Kazuha	0.029
34	Chasca	0.029
32	Tartaglia	0.059
9	Chongyun	0.206
26	Qiqi	0.206
2	Bennett	0.235
7	Mona	0.235
17	Ganyu	0.235
25	Xiao	0.235
29	Fischl	0.235
31	Razor	0.235
8	Yanfei	0.265
19	Rosaria	0.265
20	Sucrose	0.265
0	Xinyan	0.294
1	Keqing	0.294
3	Xiangling	0.294
28	Diona	0.294
30	Noelle	0.294
11	Ningguang	0.324
13	Eula	0.324
14	Beidou	0.324
16	Amber	0.324
21	Hu Tao	0.324

27	Venti	0.324
10	Diluc	0.353
12	Xingqiu	0.353
15	Albedo	0.353
4	Zhongli	0.382
18	Barbara	0.382
5	Kaeya	0.412
6	Klee	0.412
24	Traveler	0.412
23	Lisa	0.471
33	Jean	0.5

2. Closeness Centrality

	Character	Closeness Centrality
34	Chasca	0.268
22	Kaedehara Kazuha	0.358
32	Tartaglia	0.362
9	Chongyun	0.436
2	Bennett	0.447
20	Sucrose	0.447
29	Fischl	0.447
7	Mona	0.459
17	Ganyu	0.459
30	Noelle	0.459
19	Rosaria	0.466
0	Xinyan	0.472
1	Keqing	0.472
16	Amber	0.479
21	Hu Tao	0.479
31	Razor	0.479
25	Xiao	0.493
26	Qiqi	0.493
6	Klee	0.5

3	Xiangling	0.507
5	Kaeya	0.507
8	Yanfei	0.507
10	Diluc	0.515
23	Lisa	0.523
13	Eula	0.531
18	Barbara	0.531
4	Zhongli	0.54
28	Diona	0.54
12	Xingqiu	0.548
14	Beidou	0.548
15	Albedo	0.567
27	Venti	0.576
11	Ningguang	0.586
24	Traveler	0.596
33	Jean	0.607

3. Betweenness Centrality

	Character	Betweenness Centrality
22	Kaedehara Kazuha	0.0
34	Chasca	0.0
9	Chongyun	0.002
17	Ganyu	0.002
1	Keqing	0.003
2	Bennett	0.003
30	Noelle	0.003
20	Sucrose	0.004
0	Xinyan	0.006
16	Amber	0.006
29	Fischl	0.006
31	Razor	0.006
7	Mona	0.007

21	Hu Tao	0.007
19	Rosaria	0.008
10	Diluc	0.011
5	Kaeya	0.016
6	Klee	0.017
18	Barbara	0.019
25	Xiao	0.021
23	Lisa	0.022
26	Qiqi	0.027
3	Xiangling	0.03
8	Yanfei	0.031
28	Diona	0.036
13	Eula	0.044
12	Xingqiu	0.052
15	Albedo	0.056
32	Tartaglia	0.059
33	Jean	0.07
11	Ningguang	0.074
14	Beidou	0.093
27	Venti	0.112
4	Zhongli	0.142
24	Traveler	0.156

4. Eigenvector Centrality

	Character	Eigenvector Centrality
0	Xinyan	0.059
1	Keqing	0.06
2	Bennett	0.156
3	Xiangling	0.07
4	Zhongli	0.078
5	Kaeya	0.271
6	Klee	0.267
7	Mona	0.169
8	Yanfei	0.065
9	Chongyun	0.039

10	Diluc	0.238
11	Ningguang	0.1
12	Xingqiu	0.081
13	Eula	0.207
14	Beidou	0.074
15	Albedo	0.228
16	Amber	0.227
17	Ganyu	0.05
18	Barbara	0.247
19	Rosaria	0.19
20	Sucrose	0.188
21	Hu Tao	0.063
22	Kaedehara Kazuha	0.006
23	Lisa	0.303
24	Traveler	0.239
25	Xiao	0.052
26	Qiqi	0.052
27	Venti	0.18
28	Diona	0.201
29	Fischl	0.149
30	Noelle	0.204
31	Razor	0.159
32	Tartaglia	0.007
33	Jean	0.313
34	Chasca	0.001

5. Katz Centrality

	Character	Katz Centrality
0	Xinyan	0.158
1	Keqing	0.158
2	Bennett	0.153
3	Xiangling	0.159
4	Zhongli	0.177

5	Kaeya	0.208
6	Klee	0.207
7	Mona	0.157
8	Yanfei	0.151
9	Chongyun	0.134
10	Diluc	0.192
11	Ningguang	0.173
12	Xingqiu	0.173
13	Eula	0.181
14	Beidou	0.165
15	Albedo	0.191
16	Amber	0.185
17	Ganyu	0.143
18	Barbara	0.199
19	Rosaria	0.167
20	Sucrose	0.166
21	Hu Tao	0.164
22	Kaedehara Kazuha	0.087
23	Lisa	0.225
24	Traveler	0.206
25	Xiao	0.141
26	Qiqi	0.135
27	Venti	0.176
28	Diona	0.176
29	Fischl	0.151
30	Noelle	0.174
31	Razor	0.155
32	Tartaglia	0.091
33	Jean	0.234
34	Chasca	0.083