

davis-club

February 28, 2026

0.0.1 Assignment Four - Davis Club

Instructions:

Here is a dataset that shows a simple 2-node network: the attendance of 18 Southern Women at 14 social events:

Brief Description. Small “musty” datasets like that from this 1941 study have proven very valuable in testing and comparing new network algorithms. Dataset. Python code to create dataset: https://networkx.github.io/documentation/stable/auto_examples/algorithms/plot_davis_club.html What can you infer about the relationships between (1) the women, and (2) the social events?

Please provide your code and analysis in an Jupyter notebook stored in your GitHub repository.

Davis Southern Club Women

The following code shows how to make unipartite projections of the graph and compute the properties of those graphs.

These data were collected by Davis et al. in the 1930s. They represent observed attendance at 14 social events by 18 Southern women. The graph is bipartite (clubs, women).

```
[1]: import matplotlib.pyplot as plt
import networkx as nx
from networkx.algorithms import bipartite

G = nx.davis_southern_women_graph()
women = G.graph["top"]
clubs = G.graph["bottom"]

print("Biadjacency matrix")
print(bipartite.biadjacency_matrix(G, women, clubs))

# project bipartite graph onto women nodes
W = bipartite.projected_graph(G, women)
print()
print("#Friends, Member")
for w in women:
    print(f"{W.degree(w)} {w}")

# project bipartite graph onto women nodes keeping number of co-occurrence
```

```

# the degree computed is weighted and counts the total number of shared contacts
W = bipartite.weighted_projected_graph(G, women)
print()
print("#Friend meetings, Member")
for w in women:
    print(f"{W.degree(w, weight='weight')} {w}")

pos = nx.spring_layout(G, seed=648) # Seed layout for reproducible node
    ↪ positions
nx.draw(G, pos)
plt.show()

```

Biadjacency matrix

<Compressed Sparse Row sparse array of dtype 'int64'
with 89 stored elements and shape (18, 14)>

Coords	Values
(0, 0)	1
(0, 1)	1
(0, 2)	1
(0, 3)	1
(0, 4)	1
(0, 5)	1
(0, 7)	1
(0, 8)	1
(1, 0)	1
(1, 1)	1
(1, 2)	1
(1, 4)	1
(1, 5)	1
(1, 6)	1
(1, 7)	1
(2, 1)	1
(2, 2)	1
(2, 3)	1
(2, 4)	1
(2, 5)	1
(2, 6)	1
(2, 7)	1
(2, 8)	1
(3, 0)	1
(3, 2)	1
:	:
(12, 7)	1
(12, 8)	1
(12, 9)	1
(12, 11)	1
(12, 12)	1
(12, 13)	1

(13, 5)	1
(13, 6)	1
(13, 8)	1
(13, 9)	1
(13, 10)	1
(13, 11)	1
(13, 12)	1
(13, 13)	1
(14, 6)	1
(14, 7)	1
(14, 9)	1
(14, 10)	1
(14, 11)	1
(15, 7)	1
(15, 8)	1
(16, 8)	1
(16, 10)	1
(17, 8)	1
(17, 10)	1

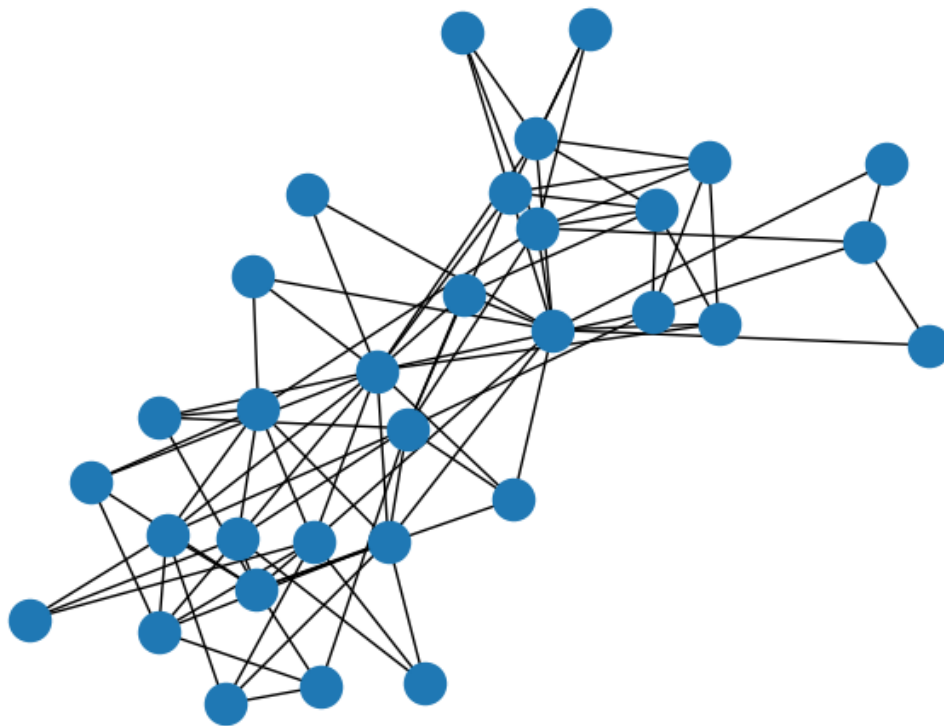
#Friends, Member

17 Evelyn Jefferson
 15 Laura Mandeville
 17 Theresa Anderson
 15 Brenda Rogers
 11 Charlotte McDowd
 15 Frances Anderson
 15 Eleanor Nye
 16 Pearl Oglethorpe
 17 Ruth DeSand
 17 Verne Sanderson
 16 Myra Liddel
 16 Katherina Rogers
 17 Sylvia Avondale
 17 Nora Fayette
 17 Helen Lloyd
 16 Dorothy Murchison
 12 Olivia Carleton
 12 Flora Price

#Friend meetings, Member

50 Evelyn Jefferson
 45 Laura Mandeville
 57 Theresa Anderson
 46 Brenda Rogers
 24 Charlotte McDowd
 32 Frances Anderson
 36 Eleanor Nye

31 Pearl Oglethorpe
40 Ruth DeSand
38 Verne Sanderson
33 Myra Liddel
37 Katherina Rogers
46 Sylvia Avondale
43 Nora Fayette
34 Helen Lloyd
24 Dorothy Murchison
14 Olivia Carleton
14 Flora Price



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