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Case Study 6 Homework: Exercises 5-7

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Homework due Jul 14, 2021 05:59 +06

Exercise 5

1/1 point (graded)

In Exercise 5, we will create a function that computes the observed homophily given a village and characteristic.

Instructions

Complete the function `homophily()`, which takes a network `G`, a dictionary of node characteristics `chars`, and node IDs `IDs`. For each node pair, determine whether a tie exists between them, as well as whether they share a characteristic. The total count of these is `num_ties` and `num_same_ties`, respectively, and their ratio is the homophily of `chars` in `G`. Complete the function by choosing where to increment `num_same_ties` and `num_ties`.

Complete this function:

```
def homophily(G, chars, IDs):
    """
    Given a network G, a dict of characteristics chars for node IDs,
    and dict of node IDs for each node in the network,
    find the homophily of the network.
    """
    num_same_ties = 0
    num_ties = 0
    for n1, n2 in G.edges():
        if IDs[n1] in chars and IDs[n2] in chars:
            if G.has_edge(n1, n2):
                # Should `num_ties` be incremented? What about `num_same_ties`?
                if chars[IDs[n1]] == chars[IDs[n2]]:
                    # Should `num_ties` be incremented? What about `num_same_ties`?
            return (num_same_ties / num_ties)
```

What should be done if the first conditional statement, `if G.has_edge(n1, n2)`, is `True`?

- ☐ Increment `num_ties` and decrement `num_same_ties`
- ☐ Do nothing to `num_ties` and increment `num_same_ties`
- ☐ Decrement `num_ties` and do nothing to `num_same_ties`
- ☒ Increment `num_ties` and do nothing to `num_same_ties`



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You have used 1 of 2 attempts

✓ Correct (1/1 point)

Exercise 6

1/1 point (graded)

In Exercise 6, we will obtain the personal IDs for Villages 1 and 2. These will be used in the next exercise to calculate homophily for these villages.

Hide Notes

Instructions

In this dataset, each individual has a personal ID, or PID, stored in `key_vilno_1.csv` and `key_vilno_2.csv` for villages 1 and 2, respectively. `data_filepath1` and `data_filepath2` contain the URLs to the datasets used in this exercise. Use `pd.read_csv` to read in and store `key_vilno_1.csv` and `key_vilno_2.csv` as `pid1` and `pid2` respectively.

The code to get you started can be found here:

```
data_filepath1 = "https://courses.edx.org/asset-v1:HarvardX+PH526x+2T2019+type@asset+block@key_vilno_1.csv"
data_filepath2 = "https://courses.edx.org/asset-v1:HarvardX+PH526x+2T2019+type@asset+block@key_vilno_2.csv"

# Enter code here!
```

What is the personal ID of the person at index 100 in village 1?

✓

102205

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You have used 3 of 10 attempts

✓ Correct (1/1 point)

Exercise 7

1/1 point (graded)

In Exercise 7, we will compute the homophily of several network characteristics for Villages 1 and 2 and compare them to homophily due to chance alone. The networks for these villages have been stored as networkx graph objects G1 and G2.

Instructions

- Use your `homophily()` function to compute the observed homophily for sex, caste, and religion in Villages 1 and 2. Print all six values.
- Use `chance_homophily()` to compare the observed homophily values to the chance homophily values. Are observed values higher or lower than those expected by chance?

Here's the code to get you started:

```
import networkx as nx
A1 = np.array(pd.read_csv("https://courses.edx.org/asset-v1:HarvardX+PH526x+2T2019+type@asset+block@adj_al
A2 = np.array(pd.read_csv("https://courses.edx.org/asset-v1:HarvardX+PH526x+2T2019+type@asset+block@adj_al
G1 = nx.to_networkx_graph(A1)
G2 = nx.to_networkx_graph(A2)

pid1 = pd.read_csv(data_filepath1, dtype=int)['0'].to_dict()
pid2 = pd.read_csv(data_filepath2, dtype=int)['0'].to_dict()

# Enter your code here!
```

For which characteristics is the observed homophily higher than the chance homophily?
Select ALL that apply.

☒ Village 1 sex

✎ Hide Notes

☒ Village 2 sex

☒ Village 1 caste

☒ Village 2 caste

☒ Village 1 religion

☐ Village 2 religion



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You have used 1 of 2 attempts

✓ Correct (1/1 point)



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