

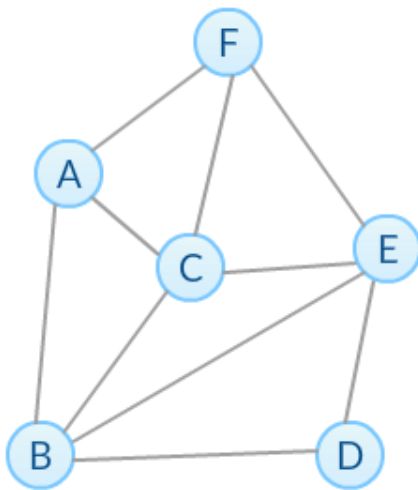
## Module 4 Quiz

Quiz, 10 questions

1  
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1.

Suppose  $P(k)$  denotes the degree distribution of the following network, what is the value of  $P(2) + P(3)$ ?



- ☐  $\frac{1}{6}$
- ☐  $\frac{1}{3}$
- ☒  $\frac{1}{2}$
- ☐  $\frac{5}{6}$

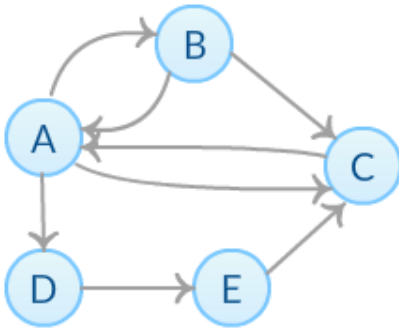
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2.

# Module 4 Quiz

Let  $P(k)$  denote the in-degree distribution of the given network below. What value of  $k$  gives the highest value of  $P(k)$ ?

Quiz, 10 questions



- ☐ 3
- ☐ 2
- ☒ 1
- ☐ 0

1  
point

3.

Select all that apply

- ☐ Networks with a power law distribution have many nodes with large degree and a few nodes with very small degree.
- ☒ If we draw a power law distribution in log-log scale, the distribution will look like a straight line.
- ☐ In the Preferential Attachment Model, a new node always connects to the node with highest in-degree.
- ☒ The Preferential Attachment Model generates a network with a power law degree distribution.

1  
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4.

Select all that apply

- ☐ Small-world networks are always connected.
- ☒ In the small-world model starting with  $k$  nearest neighbors, increasing the rewiring probability  $p$  generally decreases both the average clustering coefficient and average shortest path.

## Module 4 Quiz

Quiz, 10 questions

The Preferential Attachment Model generates a small-world network.

The degree distribution of small-world networks follows power-law distribution.

☐

Some Small-world networks have high local clustering coefficient and small average shortest path.

1

point

5.

Suppose we want to generate several small-world networks with  $k$  nearest neighbors and rewiring probability  $p$ . If  $p$  remains the same and we increase  $k$ , which best describes the variation of average local clustering coefficient and average shortest path?

☐

Both of them will increase.

☐

Both of them will decrease.

☐

Average local clustering coefficient will increase and average shortest path will decrease.

☐

Average local clustering coefficient will decrease and average shortest path will increase.

1

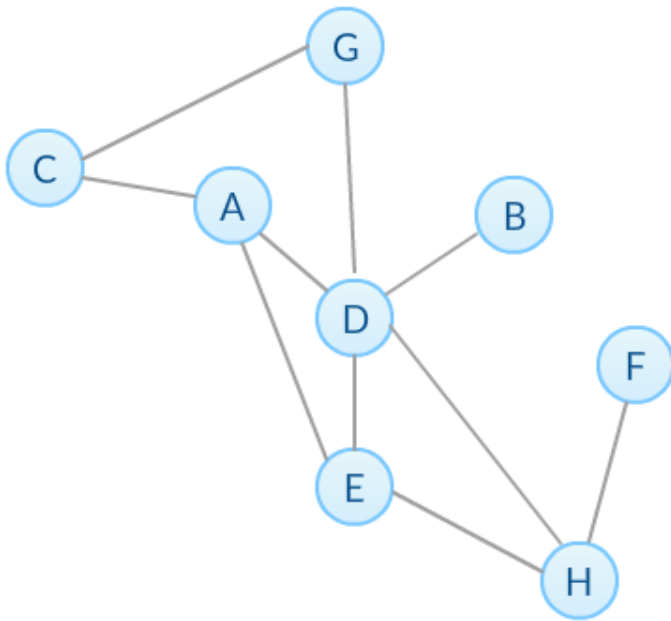
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6.

## Module 4 Quiz

Based on the network below, suppose we want to apply the common neighbors measure to add an edge between nodes C and H. Which is the most probable node to connect to H?

Quiz, 10 questions



- ☒ A
- ☐ B
- ☐ C
- ☐ G

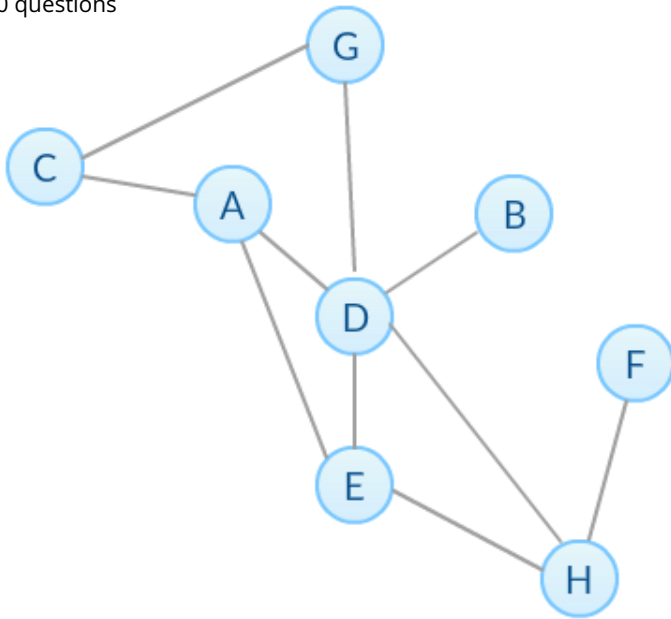
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7.

Based on the network below, what is the Jaccard coefficient of nodes D and C?

## Module 4 Quiz

Quiz, 10 questions



- ☐ 0.29
- ☐ 0.33
- ☒ 0.40
- ☐ 0.50

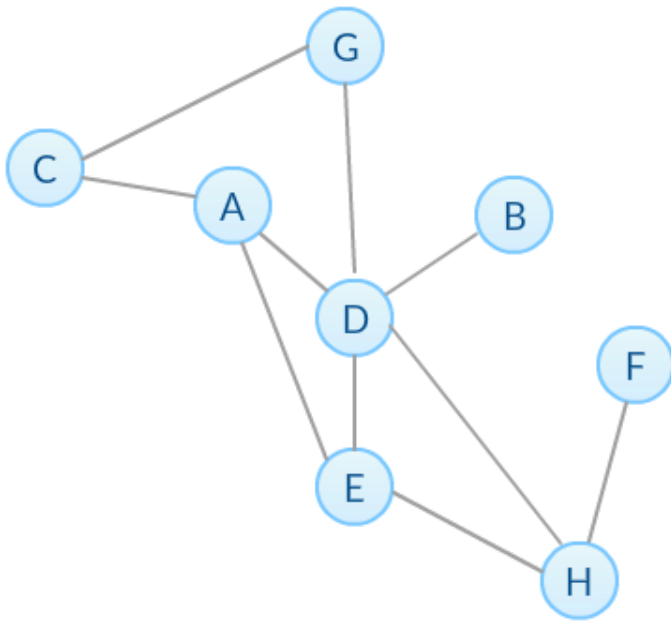
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8.

## Module 4 Quiz

Based on the network below, if we apply Resource Allocation method to predict the new edges, what is the value of Resource Allocation index of nodes C and D?

Quiz, 10 questions



- ☐ 0.20
- ☐ 0.33
- ☐ 0.70
- ☒ 0.83

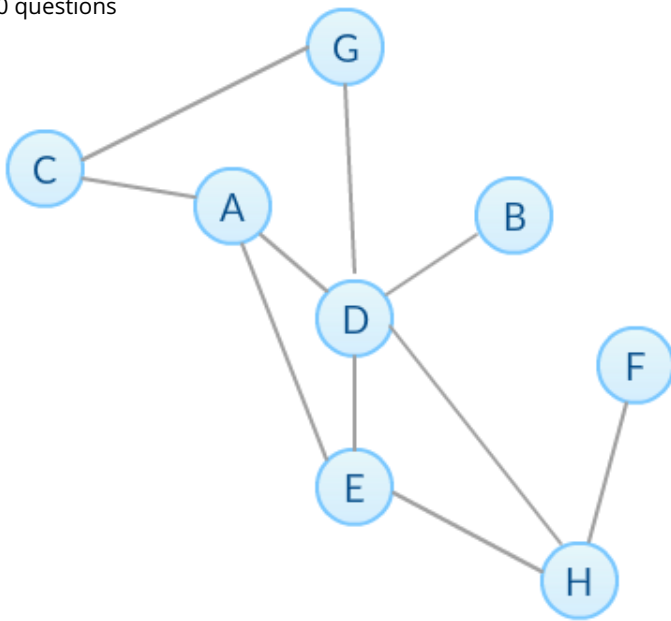
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9.

Based on the network below, what is the preferential attachment score of nodes C and D?

## Module 4 Quiz

Quiz, 10 questions



- ☐ 5
- ☐ 8
- ☒ 10
- ☐ 15

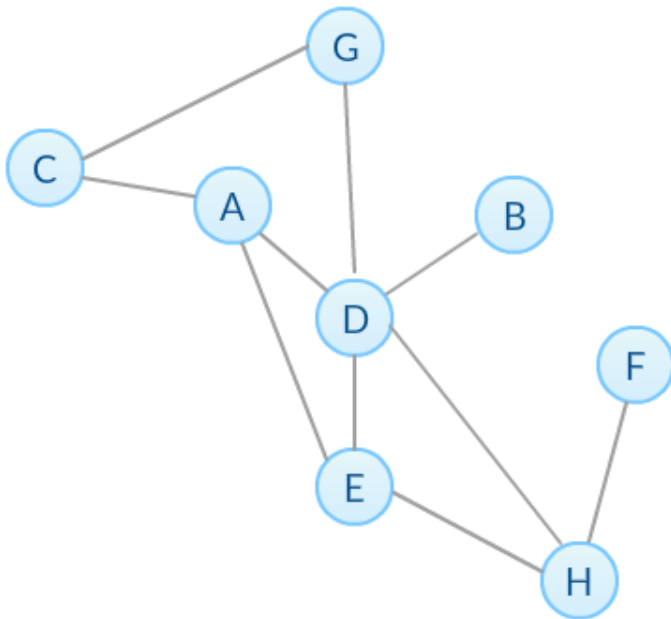
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10.

## Module 4 Quiz

Assume there are two communities in this network: {A, B, C, D, G} and {E, F, H}. Which of the following statements is (are) True? Select all that apply.

Quiz, 10 questions



- ☐ The Common Neighbor Soundarajan-Hopcroft score of node C and node D is 2.
- ☒ The Common Neighbor Soundarajan-Hopcroft score of node A and node G is 4.
- ☐ The Resource Allocation Soundarajan-Hopcroft score of node E and node F is 0.
- ☒ The Resource Allocation Soundarajan-Hopcroft score of node A and node G is 0.7

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