A Short Introduction to Networks and Model Comparisons

Levi Lee

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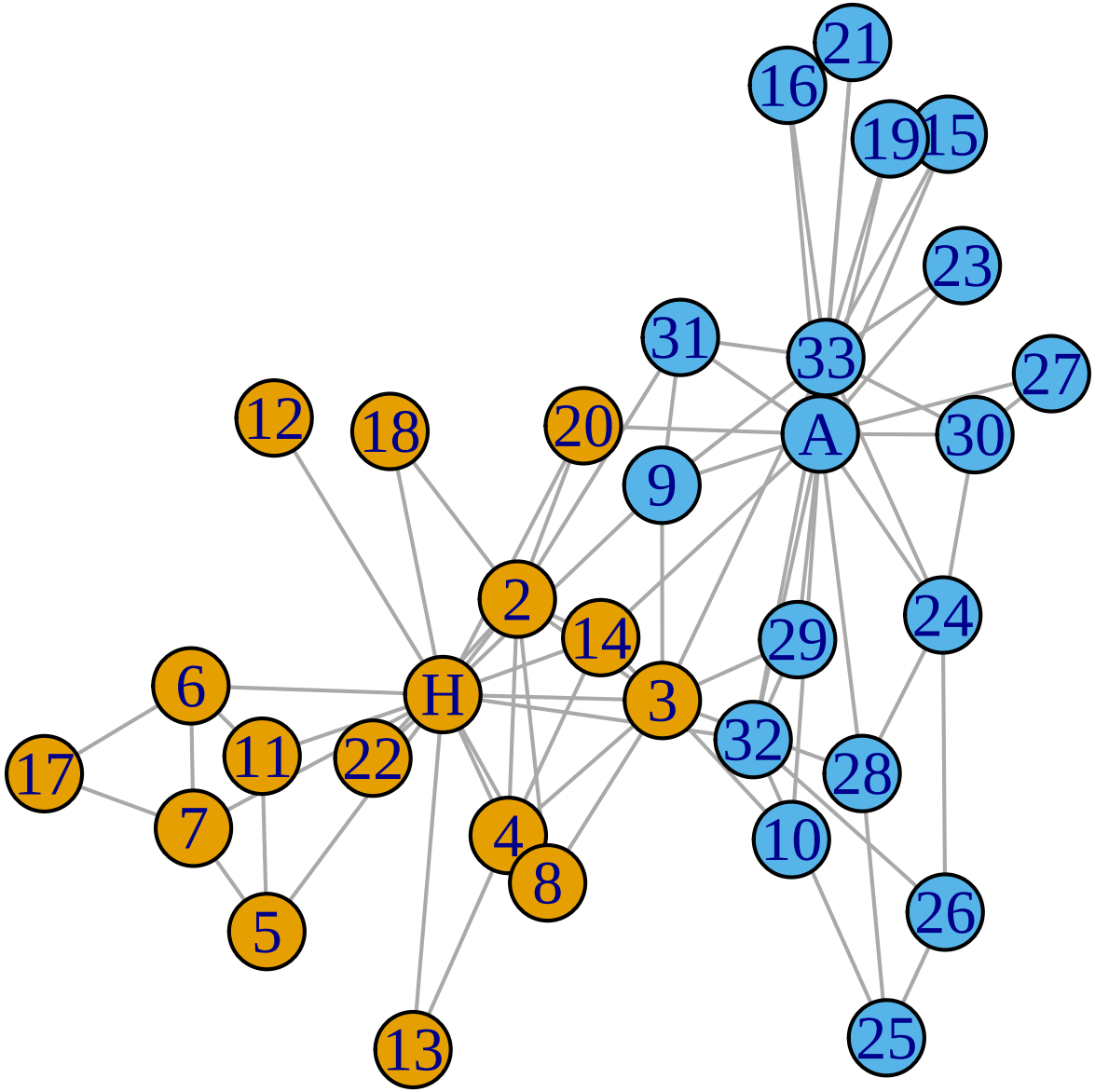
What is a Network?

A collection of nodes and edges

Can display multiple layers of data

Example: Karate Club of Zachary (1977)



Can we simulate this?

What kind of graph model are we choosing?

What characterstics of the graph will we choose to look at?

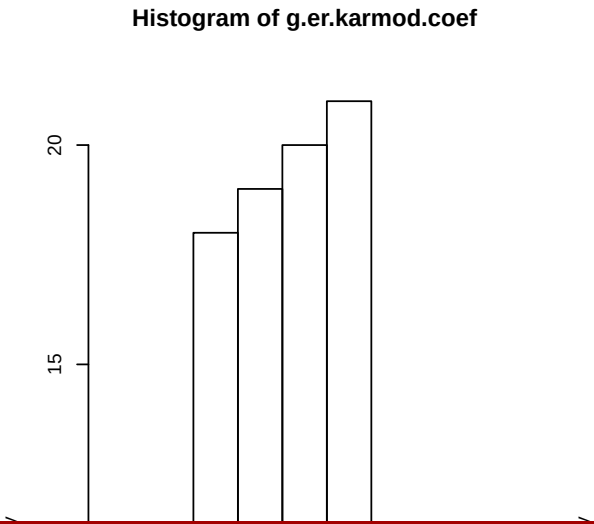
What are some methods to access accuracy?

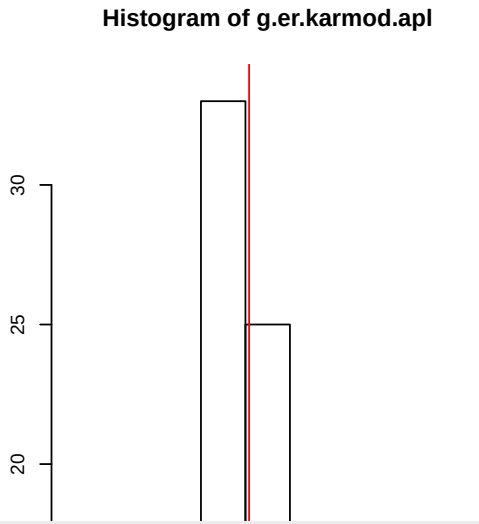
Erdos-Reni Model

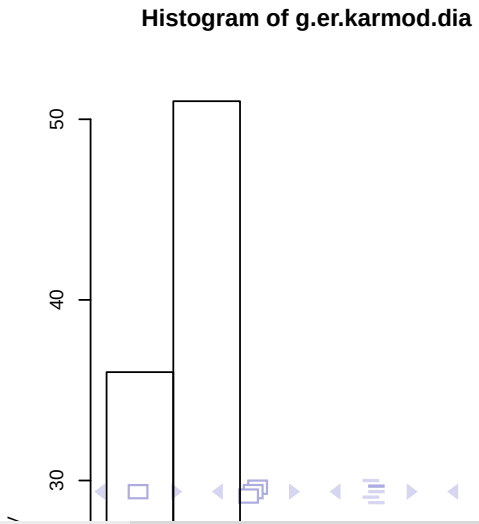
```
par(mfrow=c(1,3))
hist(g.er.karmod.coef)
abline(v = transitivity(karate), col="red")

hist(g.er.karmod.apl)
abline(v = average.path.length(karate), col="red")

hist(g.er.karmod.dia)
abline(v = diameter(karate), col="red")
```







What's Next?

Choose a different model! - Babarsi-Albert, Watts-Strogatz, ERGMs, R-MAT, HOT, COLD, ...

Look at other properties of networks -