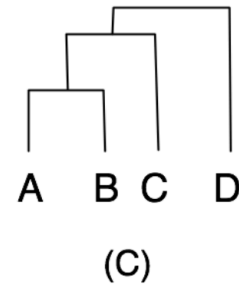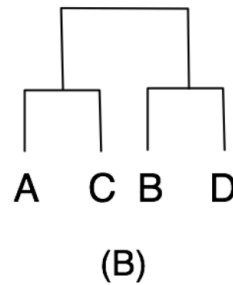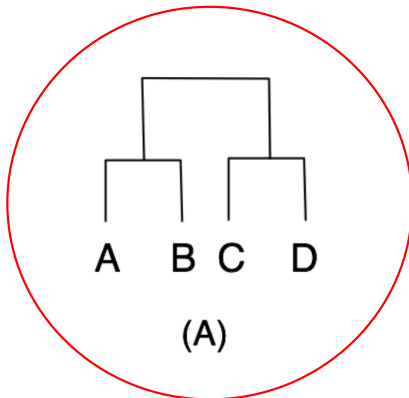# BMI/CS 576 – Day 22

- Today
  - Model-based clustering
  - Hierarchical clustering

- Next Tuesday
  - Intro to biological and Bayesian networks

Quiz

Given the distance matrix below, which clustering would result using *complete linkage*?

	A	B	C	D
A		2	6	10
B			8	12
C				7
D				

```
        ┌──────┴──────┐
     ┌──┴──┐       ┌──┴──┐
     A     B       C     D

A    B C    D
  (A)
```

```
        ┌──────┴──────┐
     ┌──┴──┐       ┌──┴──┐

A    C B    D
  (B)
```

```
       ┌────────┴────┐
    ┌──┴──┐
  ┌─┴─┐

A    B C    D
  (C)
```

Quiz example

	A	B	C	D
A		(2)	6	10
B			8	12
C				7
D				

```
 ┌─┐
 A  B C   D
```
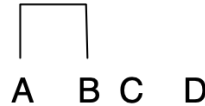
	AB	C	D
AB		8	12
C			(7)
D			

$d(AB,C) = \max(d(A,C),d(B,C)) = \max(6,8) = 8$

$d(AB,D) = \max(d(A,D),d(B,D)) = \max(10,12) = 12$

```
 ┌─┐  ┌─┐
 A  B  C  D
```

	AB	CD
AB		(12)
CD		

$d(AB,CD) = \max(d(A,C),d(B,C),d(A,D),d(B,D)) = \max(6,8,10,12) = 12$

```
    ┌────┐
  ┌─┐  ┌─┐
  A  B  C  D
```