Prof. Dr. Alexander Bockmayr,
Prof. Dr. Knut Reinert,
Sandro Andreotti

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Discrete Mathematics for Bioinformatics (P1)

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Exercises 4

1. **Tree decomposition (Niveau I)**

   Prove the following theorem:
   Let $G = (V, E)$ be a graph, T be a tree decomposition of G, and (x, y) an edge in T. The deletion of (x, y) divides T into two components X and Y. Let V_x and V_y be the 'pieces' of x and y, respectively. Then deleting the set $V_x \cap V_y$ from V disconnects G into the two subgraphs $G_X - (V_x \cap V_y)$ and $G_Y - (V_x \cap V_y)$.
   (G_M for $M = X, Y$ is the subgraph of G that consists of all nodes in the 'pieces' of M.)

2. **Tree decomposition (Niveau I)** Use the algorithm presented in the lecture to compute a tree decomposition of the graph below: