Hamiltonian Path Exercise

CMSC423

Name(s):
UID(s):

Question 1. Solve the string reconstruction problem for this set of eight 3-mers:

$$\{\texttt{AGT}, \texttt{AAA}, \texttt{ACT}, \texttt{AAC}, \texttt{CTT}, \texttt{GTA}, \texttt{TTT}, \texttt{TAA}\}$$

(a) Construct the graph with 8 vertices corresponding to these 3-mers (string overlap, Hamiltonian path approach)

(b) Find a Hamiltonian path (7 edges) which visits each vertex exactly once. Does this path visit every edge of the graph?

(c) Write the reconstructed string corresponding to this Hamiltonian path.

Question 2. When using the string overlap approach, why would a pair of reads corresponding to non-overlapping positions in the genome have an edge connecting them?