靳玉亮 986381

Problem 1

Answer the following questions about the graph G having n = 6 vertices, below. a. Is G Hamiltonian? Yes b. Any two non adjacent vertices. c. No

Problem 2

To show Any Problem Q in NP, $Q \xrightarrow{poly} TSP$.

Just show Hamiltonian $\xrightarrow{poly}$ Tsp.

We can use input of the hamiltonian problem, after s

of the input, (O(p(n)). then use the new input as

input. then we can see after O(p(n)), the so

Hamiltonian could be processed to be the solution

two much work. SO. Hamiltonian $\xrightarrow{poly}$ Tsp.

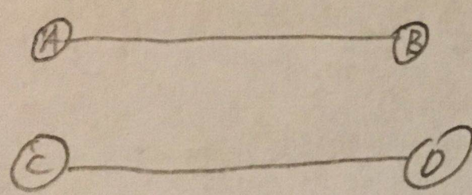
Problem 3

To show subset sum $\xrightarrow{\text{poly}}$ new knapsack problem.

We can set V to be 0, in new knapsack and W to be
subset problem, so the solution to the subset is
Solution of knapsack problem in occassion with

$\Rightarrow$ Subset Problem $\xrightarrow{\text{poly}}$ new knapsack Problem

Problem 4



Smallest vertex size

VertexCoverApprox :

Problem 5

Use dynamic programming, `B[i, j]` denotes whether there is a subset with previous i integers in the set whose sum is j. We can build such an array from `B[0, 1]` to `B[n, 10]`, then iterate over the `B[0, 10]` to `B[n, 10]` and return the `i` with the first `i` that makes `B[i][10]` to be true.

Problem 6

6. Just to verify the solution in $p(n)$ time complexicity.

$G=(V, E)$.

1. To verify that every edge in G, atleast one vertex
solution, this takes $O(m)$. ($O(n^2)$ in the worst cas
2. To show the size of vertex cover is less or
this takes $O(1)$.

$\Rightarrow$. $Q \subseteq NP$.