Problem Set 8

COSC 240  
Spring 2019

Due April 30, 2019

40 points (20 points for each question)

1. Using the discussion on slides 74-75 of <https://courses.engr.illinois.edu/cs473/fa2010/Lectures/lecture20.pdf> show that there is a polynomial time reduction from the vertex cover problem to the set cover problem.
2. Hamiltonian cycle in an undirected graph G(V,E) is a cycle that contains each vertex in V exactly once. Consider the following *decision* problem:  
     
    Does a graph G have a Hamiltonian cycle?

Explain briefly why the above problem is in NP.  
  
**Hint**: Show that the there exists a polynomial time verification algorithm.