

Assignment 2 for CMPT 307 (2013)
September 25, 2013

These problems on Graphs will prepare you for Quiz 1, scheduled to be held on October 1, 2013.

1. Exercises 1, 2, 5, 7, 10 of Chapter 3 of the textbook.
2. Suppose an adjacent list (L_G) of a directed graph $G = (V, E)$, $|V| = n$ and $|E| = m$, is given. Determine the adjacent list ($L_{G^{rev}}$) from L_G where $G^{rev} = (V, E')$, and for each $(u, v) \in E$, $(v, u) \in E'$. G^{rev} is called the reverse of G . The algorithm should run in $O(m + n)$ time.
3. A tour of a graph G is a closed walk of the nodes which includes every edge of G at least once. An **Euler tour** of an undirected graph $G = (V, E)$ is a tour which includes every edge exactly once (it may visit a node more than once).
 - (a) Show that a connected graph G has an Euler tour if and only if the degree of each node is even.
 - (b) Describe an $O(|V| + |E|)$ -time algorithm to find a Euler tour of G if one exists.