

Homework questions 18, 19

CISC 320

April 15, 2015

- 18 This concerns maximal matchings in bipartite graphs (see DM 6.5.1) Draw bipartite graphs exemplifying each of the following four situations. The graph vertices are partitioned into two subsets. W is the workers and J is the jobs, $V = W \cup J$. Every edge of the graph is of the form (w,j) , with $w \in W, j \in J$. Each example must have at least 6 vertices.
- (a) A graph in which there is a matching so that every worker and job is matched
 - (b) A graph in which a maximal matching satisfies every worker but not every job.
 - (c) A graph in which a maximal matching satisfies every job but not every worker.
 - (d) A graph in which a maximal matching satisfies neither every job nor every worker.
- 19 There are 5 bridges from the Delmarva peninsula (below the Delaware and Chesapeake Canal) to the mainland. In view of the predicted hurricane Zorro (most massive hurricane ever), everyone on the peninsula (with their vehicles) has gathered at Dover Downs in preparation for evacuation. Given a graph of the vehicle flow capacity on every road segment on Delmarva peninsula (including the 5 bridges), design an algorithm to plan a maximally fast evacuation. It will definitely help to read DM 6.6 for this.

Note: These are HW problems of the day 18 and 19. Quiz questions and hw extra credit also are in the numbering. In total 30 hw problems and quiz question will count. There will be a total 35 to 40 given out, which allows for missing a few.