Math 2300 Assignment #5
## due by 5:00pm, Friday, April 9, 2010

Please include your Maple worksheet with your assignment. You may email your Maple worksheet to me. If you do email, please print to a .pdf file and email me a .pdf document.

1. (*#10, p.310, text*) A basketball coach needs to find a starting lineup for her team. There are five positions that must be filled: point guard(1), shooting guard(2), swing(3), power forward(4), and center(5). Given the data in the following table (of who can play what position), create a graph model and use it to find a feasible starting lineup. What changes if the coach decides she can't play Hermione in position 3?

Alice	Bonnie	Courtney	Deb	Ellen	Fay	Gladys	Hermione
1, 2	1	1, 2	3, 4, 5	2	1	3, 4	2, 3

2. (*Graphs in Maple*) After including the package `GraphTheory` in Maple, answer the following questions. For most parts, the necessary command has been included but the syntax has not. Use the Maple help function to determine how to use the necessary commands.

   (a) Using the command `Graph`, enter the following graph into Maple. Draw the graph using the command `DrawGraph`.
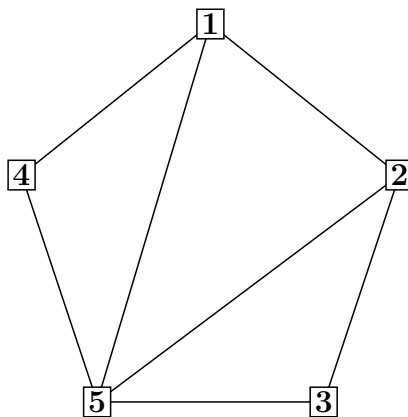
   (Use `?Graph` to determine the proper usage for the `Graph` command)

   (b) Using the command `AdjacencyMatrix`, determine the adjacency matrix for the graph given in part (a).

(c) Enter the following graph in Maple. Note that the graph is a weighted graph. Use Maple help `?Graph` to determine how to enter a weighted graph. The numbers in bold are the labels for the graphs, the other numbers are the weights for the edges.
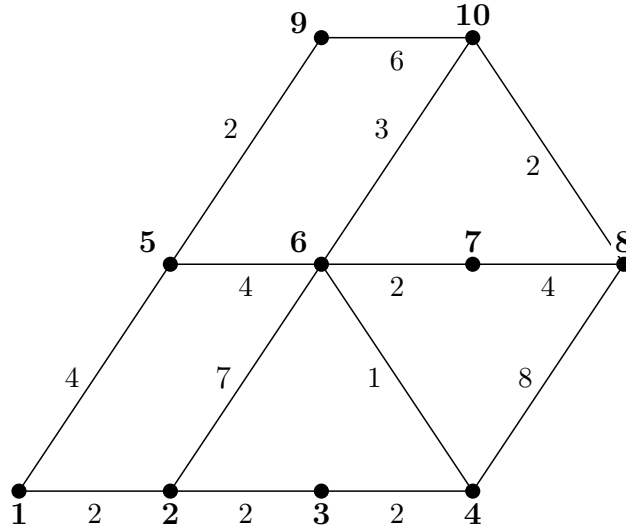
Note: if you draw the graph it may look different than what is drawn on paper. Convince yourself that this is the correct graph.

(d) Using Dijkstra's algorithm, find the shortest path from node 1 to node 8 in the graph in part (c). Use the Maple command `DijkstrasAlgorithm`. What is the shortest path? What is the "cost" or total weight of this shortest path?

(e) Using the graph in part (c), find a minimal spanning tree using the Maple command `MinimalSpanningTree`. What is the "cost" or total weight of this spanning tree?

3. (*Simulation*) Use Monte Carlo simulation (in Maple) to approximate the area under the curve $f(x) = \sqrt{x}$, over the interval $\frac{1}{2} \leq x \leq \frac{3}{2}$.

What is the total number of random points generated in your simulation? What is the upper bound on the y-coordinates?