MA/CSSE 474 Homework #12 78 points

Solutions should be written clearly, or typed and printed (preferably double-sided).
2.1 means Exercise 1 from Chapter 2.
Carefully study the textbook's notation for PDAs, and use the same notation for all PDAs that you produce. You may present them either as transition diagrams or as text descriptions of the transition relations.

1. 12.1j

2. (t-6-6-6) 12.3

   Hints for 5: (a) Have states and transitions to handle the "don't care" sections where we aren't worried about the number of b's. (b) One nonterminal for when the $m_i > m_j$, and one for when $m_i < m_j$. (c) Pumping theorem alone probably won't do it; also use closure property.

   Previous problem 5 questions and answers from Piazza:

   Q When it says: "Mi (not equal to) Mj for some i, j", does that mean for a random i and j, or does that imply that for all Mx, none of them are equal each other?

   A "For some" does not mean "for all". It means "for at least one pair (i, j)", m_i does not equal m_j". If it was "for all", the language would definitely not be context-free.

3. (t-3-3-3-3) 12.4

4. (t-9) 12.5a Hint: In order to be deterministic, the first thing your PDA should do, before it adds any input, is to push a special "bottom of stack" marker

5. (t-9) 12.6 You must describe a construction that starts with a PDA that accepts by accepting state alone. The construction produces a PDA that accepts the same language by our standard approach: accepting state and empty stack. Be sure that you tell explicitly how to produce the second PDA from the first one.

6. (t-6) 13.1a

7. (t-6) 13.1b

8. (t-12) 13.1c

9. (t-6) 13.1d