Laurea Magistrale in INFORMATICA
Principi di Linguaggi di Programmazione
Compiler Techniques

prof. M. Bellia
Mid Term Exam - 4 November 2014

(Available Time: 2 hours – Get, in each exercise, at least, half of the total points assigned to it)

Exercise 1 (pts 3 - 6) Let E = a b* b | d b b* a
(a) (pts 4) Show how the technique of "dotted automata" has to be applied to compute a deterministic automaton for E;
(b) (pts 2) Prove that the obtained automaton is minimal

Exercise 2 (pts 3 - 6) Let L = $\{d^q a^n b^m c^p \mid n+m=p, n,m,p,q \geq 0\}$. Is L a regular language? The answer must furnish either an automaton for L or a prove of the opposite.

Exercise 3 (pts 3 - 5) Let A=<S,∑,M,{3,5}> be the automaton whose transition function M is as in the enclosed figure. Show how the algorithm for removing nonderminism applies to it.

	a	b	c	ε
0	{2,3}	–	–	{1}
1	–	{0,1}	{4}	
2	–	–	–	{5}
3	{3}	{5}	{0}	{0}
4	{1}	{2}	–	{3}
5	–	{5}	–	{1}

Exercise 4 (pts 7 - 13) Let $\{a^n b^m c^p \mid n+m=p, n \geq 0, m>0\}$.
(a) (pts. 5) Write an LL(1) grammar G for L;
(b) (pts. 2) Prove that G∈LL(1);
(c) (pts. 4) Show how to compute an adaptive parsing table for G, by computing it;
(d) (pts. 2) Use such a table in parsing "aabccc"