Nathan Brooks CS4110 Homework 9 Due November 16

P01. Post Machine

Trace the paths of the following input strings on this PM. At every step, name the current state and the contents of the STORE: "abab", "aabbbb", and "bbabaaa".

Trace "abab'	ı -	Trace "aabb	bb"	Trace "bbaba	<u>aaa"</u>
START	abab	START	aabbbb	START	bbabaaa
READ2	abab	READ2	aabbbb	READ2	bbabaaa
READ1	bab	READ1	abbbb	READ3	babaaa
READ2	ab	ADD a		ADD b	
READ1	b	READ1	bbbba	READ3	abaaab
READ2	NULL	READ2	bbba	READ2	baaab
ACCEPT		READ3	bba	READ3	aaab
		ADD b		READ2	aab
		READ3	bab	READ1	ab
		ADD b		ADD a	
		READ3	abb	READ1	ba
		READ2	bb	READ2	a
		READ3	b	READ1	NULL
		READ3	b	CRASH	
		ADD b			
		READ3	b		
		ADD b			
		LOOP	b		

P02. 2PDA

Trace the execution of these input strings on this machine: "aabb" and "babab".

Trace of "aa	bb"		
<u>STATE</u>	<u>TAPE</u>	STACK1	STACK2
START	aabb	Δ	Δ
READ	aabb	Δ	Δ
PUSH1 a	∆abb	a	Δ
READ	∆abb	а	Δ
PUSH1 a	ΔΔbb	aa	Δ
READ	ΔΔbb	aa	Δ
PUSH2 b	ΔΔΔb	aa	b
READ	ΔΔΔb	aa	b
PUSH2 b	ΔΔΔΔ	aa	bb
READ	$\Delta\Delta\Delta\Delta$	aa	bb
POP1	ΔΔΔΔ	a	bb
POP2	ΔΔΔΔ	a	b
POP1	ΔΔΔΔ	Δ	b
POP2	ΔΔΔΔ	Δ	Δ
POP1	ΔΔΔΔ	Δ	Δ
POP2	ΔΔΔΔ	Δ	Δ
ACCEPT	ΔΔΔΔ	Δ	Δ
		_	_
Trace of "bal	bab"		
Trace of "bal STATE	oab" <u>TAPE</u>	STACK1	STACK2
		STACK1 Δ	STACK2 Δ
<u>STATE</u>	<u>TAPE</u>	·	
STATE START	<u>TAPE</u> babab	Δ	Δ
STATE START READ	<u>TAPE</u> babab babab	Δ	Δ
STATE START READ PUSH2 b	TAPE babab babab abab	Δ Δ Δ	Δ Δ b
STATE START READ PUSH2 b READ	TAPE babab babab abab abab	Δ Δ Δ	Δ Δ b b
STATE START READ PUSH2 b READ PUSH1 a	TAPE babab babab abab abab bab	Δ Δ Δ Δ	Δ Δ b b
STATE START READ PUSH2 b READ PUSH1 a READ	TAPE babab babab abab abab bab bab	Δ Δ Δ α a	Δ Δ b b b
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b	TAPE babab babab abab abab bab bab	Δ Δ Δ Δ a a a	Δ Δ b b b b
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ	TAPE babab babab abab bab bab bab ab	Δ Δ Δ α α α α	Δ Δ b b b bb
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH2 b READ PUSH1 a	TAPE babab babab abab bab bab bab ab bab ba	Δ Δ Δ α α α α α α	Δ Δ b b b bb bb
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH2 b READ PUSH1 a READ	TAPE babab babab abab bab bab bab ab bb bab ab	Δ Δ Δ α α α α α α α α	Δ Δ b b b bb bb bb
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH2 b READ PUSH1 a READ PUSH1 a	TAPE babab babab abab bab bab bab ab bb bab ab	Δ Δ Δ α α α α α α α α α α α	Δ Δ b b b bb bb bb
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH2 b READ PUSH1 a READ PUSH1 a READ PUSH1 b READ READ	TAPE babab babab abab bab bab ab bab bab ab	Δ Δ Δ α α α α α α α α α α α α α	Δ Δ b b b bb bb bb bbb
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH1 a READ PUSH1 a READ PUSH1 b READ PUSH1 a	TAPE babab babab abab bab bab ab bab ab ab ab ab	Δ Δ Δ α α α α α α α α α α α α α	Δ
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH1 a READ PUSH1 a READ PUSH1 a READ PUSH1 a READ POSH1 b READ POSH2 b READ POSH2 b	TAPE babab babab abab bab bab ab bab ab ab a	Δ Δ Δ α α α α α α α α α α α α α	Δ
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH2 b READ PUSH1 a READ PUSH1 a READ PUSH1 a READ PUSH2 b READ POSH1 b READ POSH2 b READ POSH2 b READ POSH2 b READ	TAPE babab babab abab bab bab ab bab bab ab	Δ Δ Δ α α α α α α α α α α α α α	Δ
STATE START READ PUSH2 b READ PUSH1 a READ PUSH2 b READ PUSH1 a READ PUSH1 a READ PUSH1 a READ PUSH2 b READ POPSH2 b READ POP1 POP2 POP1	TAPE babab babab abab bab bab bab bab bab b	Δ Δ Δ α α α α α α α α α α α α α	Δ

P02. 2PDA

Draw a PM that accepts the language { a^n b^n a^n b^n }

