

Regular Expression Assignment

1. For each of the following Regular Expressions (RE), decide which of the 4 REs accept the given word. Indicate yes if accepted and leave it blank for not accepted.

RE1: $(ab^*b^*a) + (ab+b)$

RE2: $\Lambda + (aa^*b) + b$

RE3: $((ab+ba) + [(aa+bb)(ab+ba)^*(aa+bb)^*])^*(aa+bb)(ab+ba)^*$

RE4: $(ab^*a) + (ba^*b)$

	Word	RE1	RE2	RE3	RE4
1	Λ		yes	yes	
2	a		yes	yes	yes
3	b		yes		
4	aa		yes	yes	
5	ab		yes	yes	yes
6	aba	yes			yes
7	abba			yes	yes
8	bab			yes	yes
9	baab			yes	yes
10	abbb	yes			

2. Tell where the following pairs of RE define the same language over the alphabet $\Sigma = \{a,b\}$, if not equal, show strings that are not acceptable in RE1 but acceptable in RE2, or vice-versa.

	RE1	RE2	Equal or not, explanation:
1.	$(ab)^*a$	$a(ba)^*$	Not Equal, an "abab" string is accepted by RE2 but not by RE1.
2.	$(a^* + b)^*$	$(a+b)^*$	Not Equal, string "aa" is accepted by RE1 but not by RE2, also "ba" is accepted by RE1 but not by RE2.
3.	$(a^* + b^*)^*$	$(a+b)^*$	Not Equal, "aa or"bbb" accepted by RE1 but not by RE2
4.	$(a^*bbb)^*a^*$	$a^*(ba^*)^*$	Not Equal, "ba" accepted by RE2 but not by RE1.

5.	$((a + bb)^*aa)^*$	$\Lambda + (a + bb)^*aa$	Not Equal, “aaaaaa” accepted by RE1 but not by RE2.
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6.	$(a+b)^*a(a+b)^*(a+b)^*$	$(a+b)^*ab(a+b)^*$	Not Equal, “aaa” is accepted by RE1 but not by RE2
7.	$(a+b)^*ab(a+b)^* + b^*a^*$	$(a+b)^*$	Equal, any string by RE1 is accepted by RE2
8.	$(aa)^*(\wedge + a)$	a^*	Equal, RE1 and RE2 defines the same language and any string by RE1 is accepted by RE2