

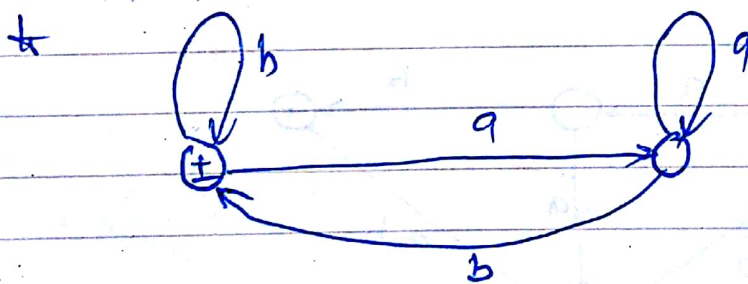
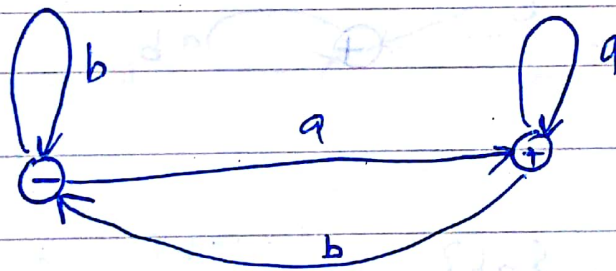
~~Union, Int~~

Union, Intersections and Complements

Before going on, first for Complement to a single FA contains

- (i) Conversion of FA to DFA
- (ii) final states to non-final states
- (iii) non final states to final states

Examples



$L = \{ \text{words start with } a \}$

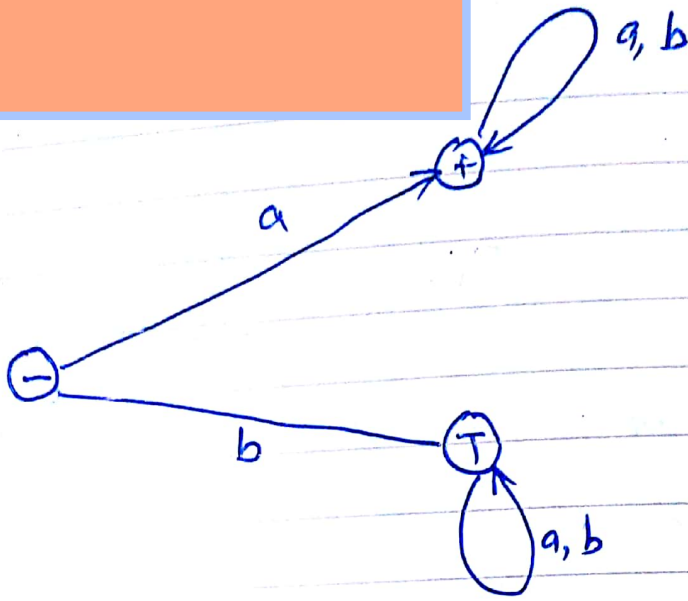
$L' = \{ \text{" " do not start " " } \}$

its DFA's are

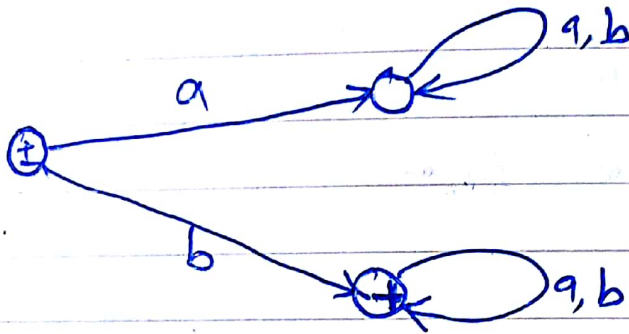
WEDNESDAY 3
18 صفر
THURSDAY 4
19 صفر

08
09
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Evening

06
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Evening



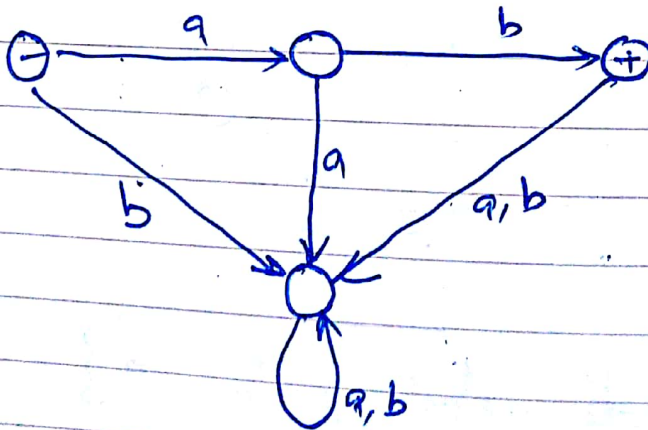
h



5 FRIDAY
۲۰ صفر

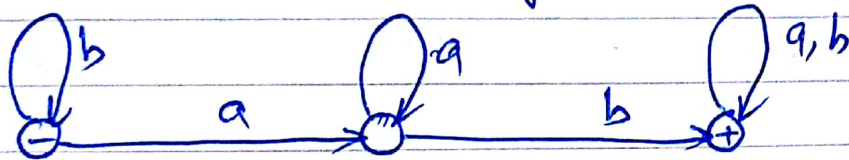
6 SATURDAY 7 SUNDAY
۲۱ صفر ۲۲ صفر

$$L = \{ab\}$$



Convert to DFA and then find Complement L'

$L \triangleq$ has substring 'ab' in words



Complement = ?

Now Case of more than one FA's

If $L_1 = \{a, ab\}$ $L_2 = \{ab\}$

$L_u = \{a, ab\} = L_1 \cup L_2$

$L_I = \{ab\} = L_1 \cap L_2$

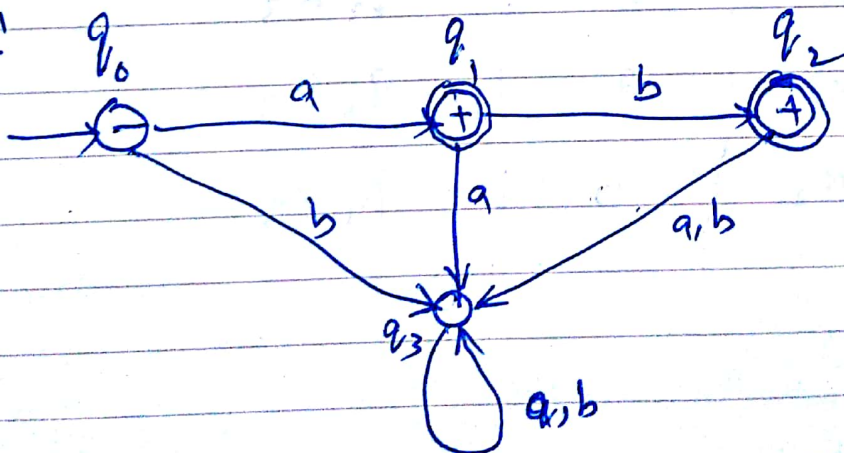
$L_c = \{a\} = L_1 - L_2 = L_c$

Evening

MONDAY 8
۲۳ صفر

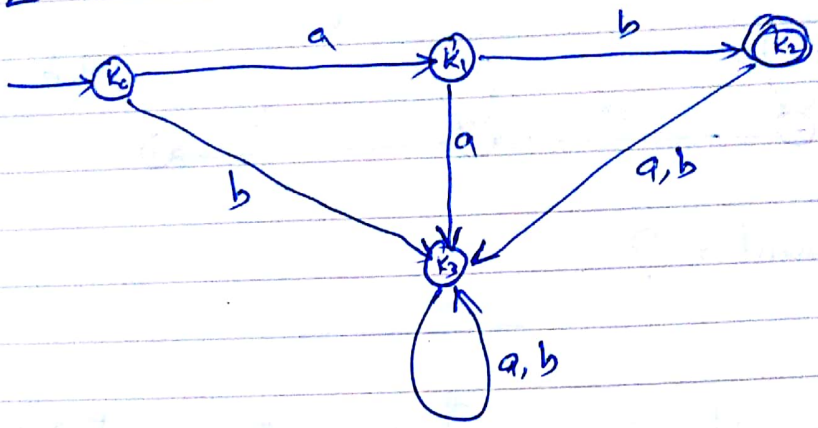
TUESDAY 9
۲۳ صفر

for L_1



Evening

for L_2



Evening

State	input	Resulting State
$q_0 k_0$	a	$q_1 k_1$
$q_0 k_0$	b	$q_3 k_3$
$q_1 k_1$	a	$q_3 k_3$
$q_1 k_1$	b	$q_2 k_2$
$q_3 k_3$	a	$q_3 k_3$
$q_3 k_3$	b	$q_3 k_3$
$q_2 k_2$	a	$q_3 k_3$
$q_2 k_2$	b	$q_3 k_3$

10 WEDNESDAY
۲۵ صفر

11 THURSDAY
۲۶ صفر

Evening

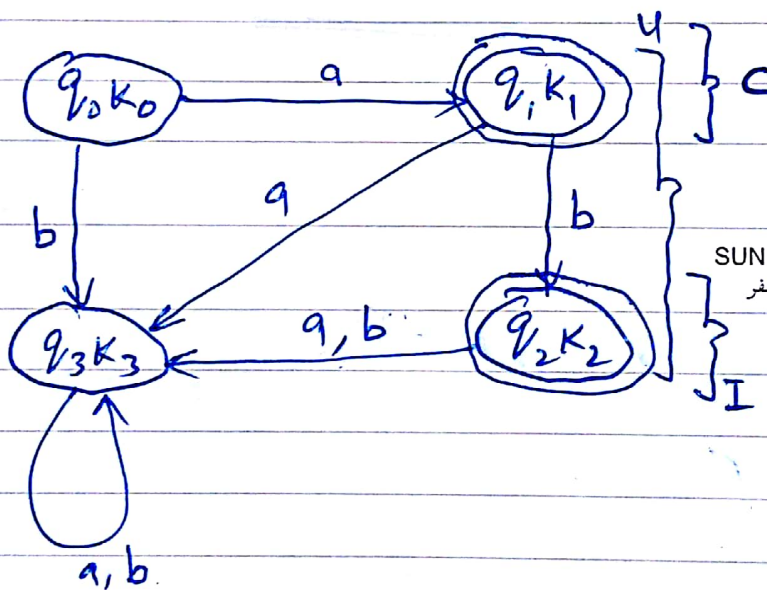
Now

Union: final states of L_1 or L_2

Intersection: final states of L_1 and L_2

Complement: final states of L_1 & non-final states of L_2

So $L_1 \cup L_2$ is, the set of final states is $\{\{q_1, q_2\} \cup \{K_2\}\}$



FRIDAY 12
صفر ۲۷

SUNDAY 14
صفر ۲۹

SATURDAY 13
صفر ۲۸

for $L_1 \cap L_2$, the set is $\{q_1, q_2\} \cap \{K_2\} = q_2k_2$

As mentioned by I bracket

for $L_1 - L_2$, the set is $\{q_1, q_2\} \setminus \{K_0, K_1, K_3\}$

$= q_1k_1$ exist only for above case

mentioned by bracket C

Example of Book

in class exercise

Assignment : 3.1, 3.9, 3.17, 3.19, 3.20, 3.21

from John C. Martin, ch 3, 3rd Edition

15 MONDAY
۳۰ صفر

16 TUESDAY
۱ ربیع الاول