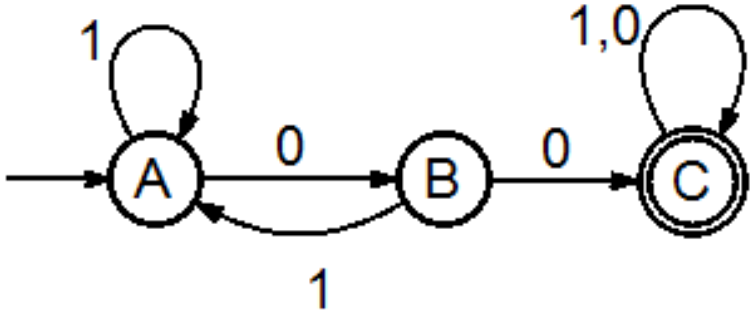
1. For each language given below, construct a DFA to accept it. Give the state diagram of the constructed DFA. In both cases, $\Sigma = \{0, 1\}$.

i) (0 | 1)*00(0 | 1)*

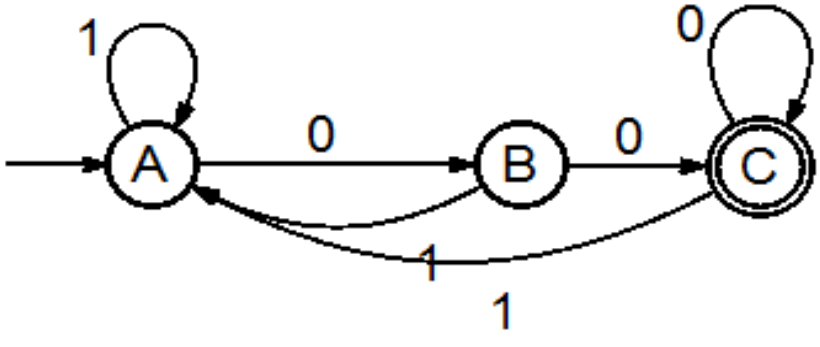


ii) (0 | 1)*00 ∩ (0 | 1)*01

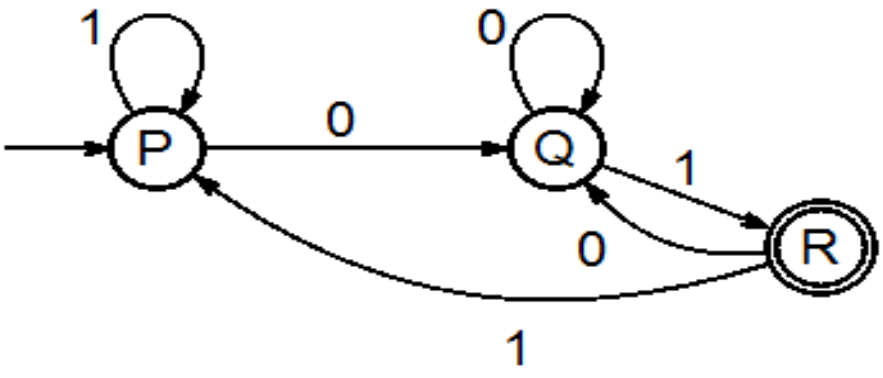
Let L = (0 | 1)*00 ∩ (0 | 1)*01

Let be L_1, L_2 languages

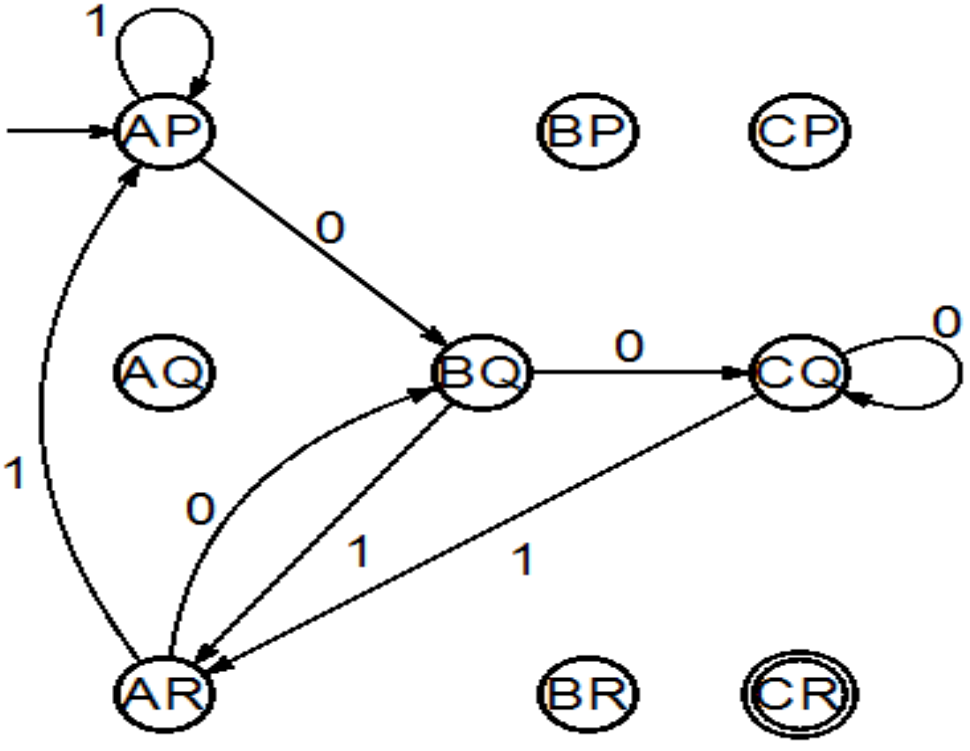
L1 = **(0 | 1)*00**



L2 = **(0 | 1)*01**



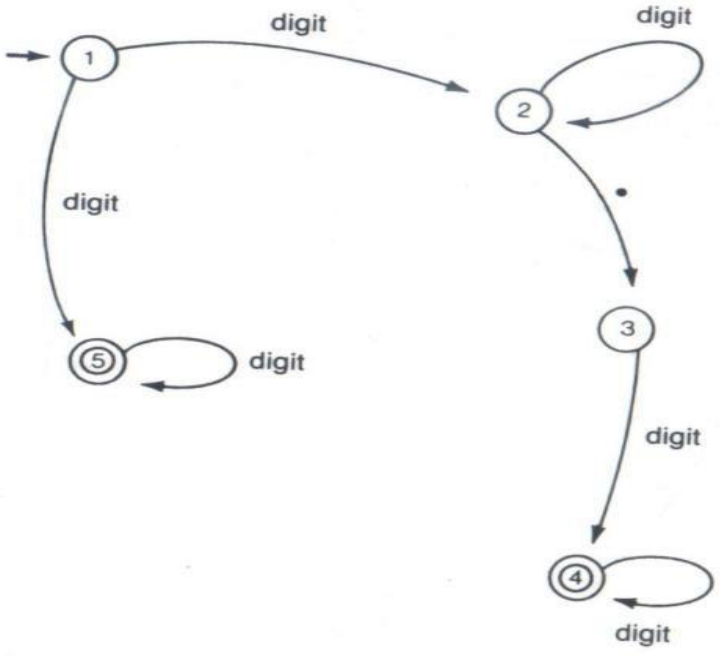
Then L = L1 ∩ L2



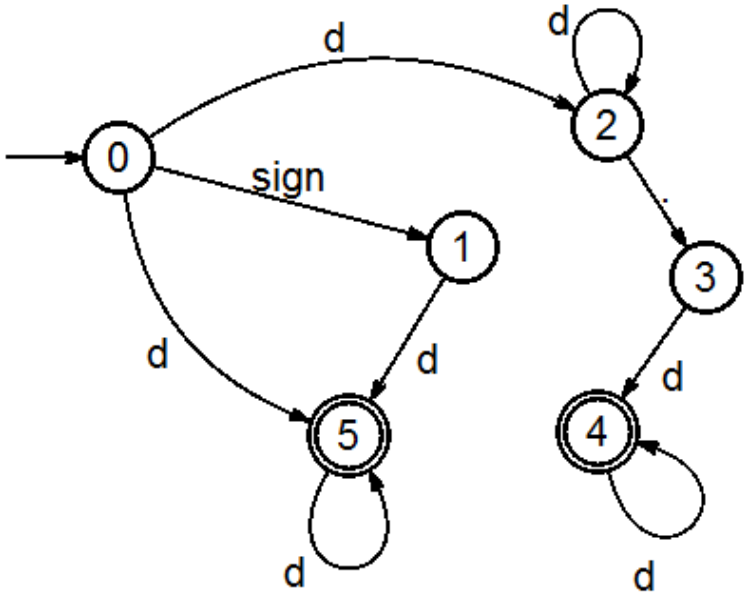
So that L1 ∩ L2 = { Ø }

2.

Transition diagram of NFA



Transition diagram of NFA for the modify version of question such that accepts the same strings as before but with an optional + or – sign at the beginning.



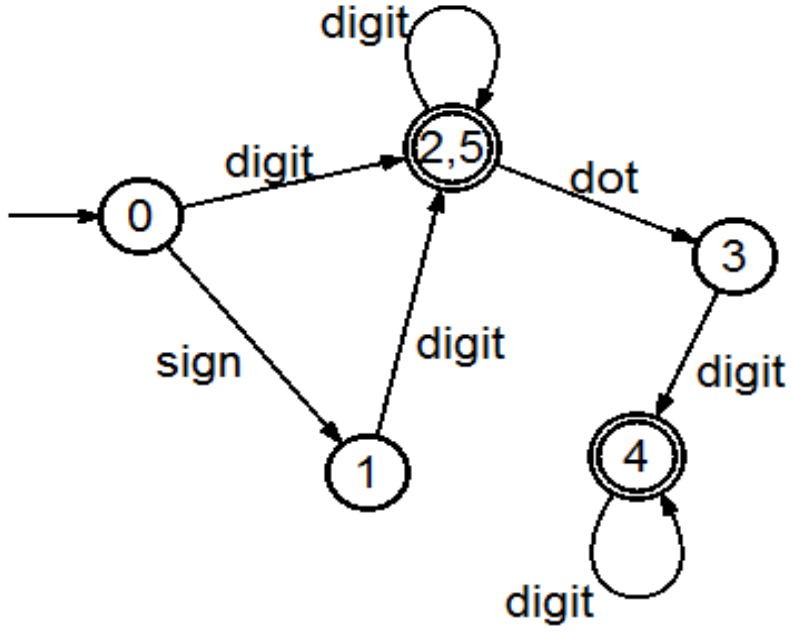
NFA

q	ð(q,digit)	ð(q,sign)	ð(q, .)
0	{2,5}	1	Ø
1	{2,5}	Ø	Ø
2	2	Ø	3
3	4	Ø	Ø
4	4	Ø	Ø
5	5	Ø	Ø

DFA

q	ð(q,digit)	ð(q,sign)	ð(q, .)
0	{2,5}	1	Ø
{2,5}	{2,5}	Ø	3
1	{2,5}	Ø	Ø
3	4	Ø	Ø
4	4	Ø	Ø

Transition diagram of DFA



3.

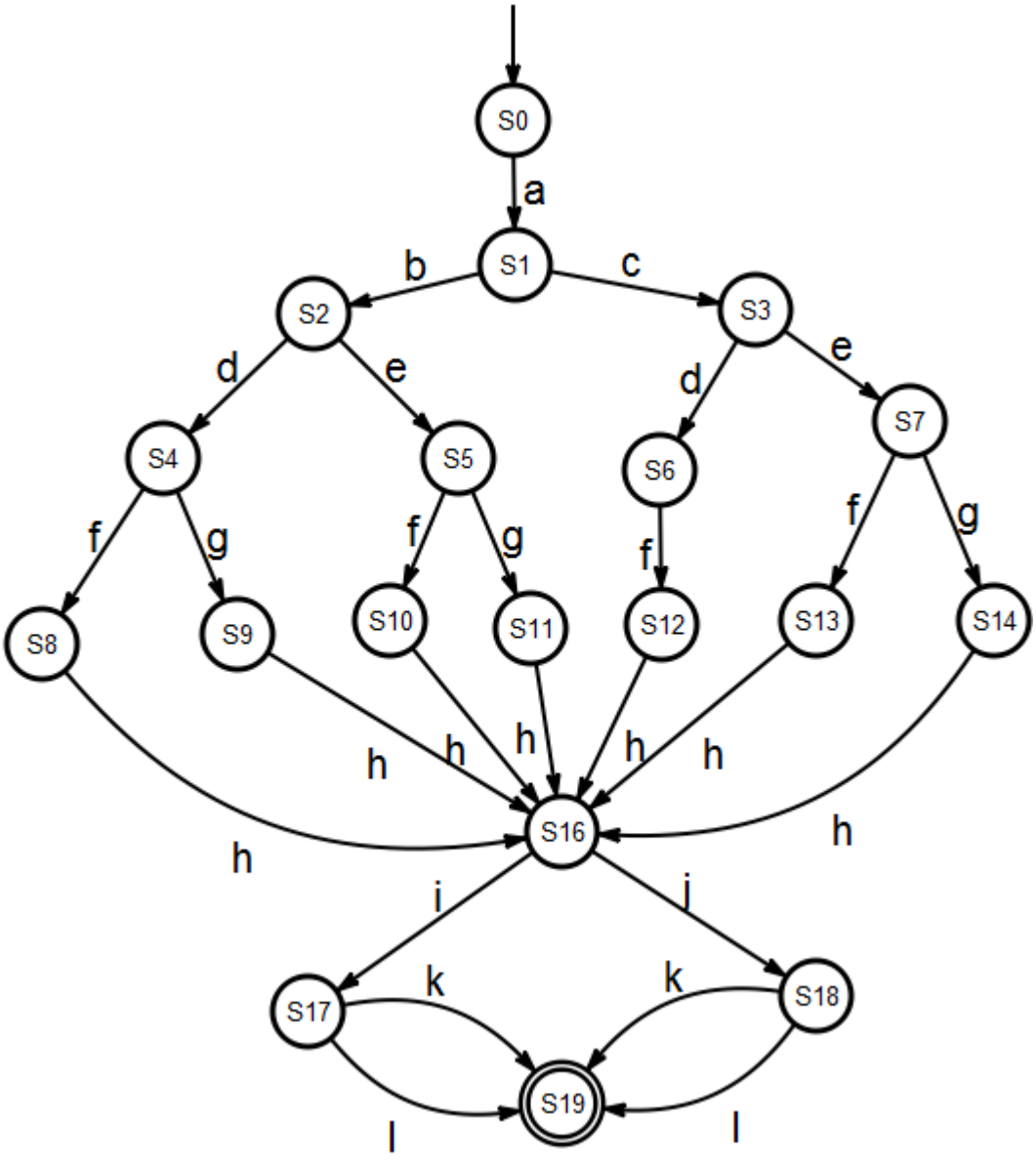
1. Thāt Asavari - Sa Re Ga Ma Pa Dha Ni
2. Thāt Bhairava - Sa Re Ga Ma Pa Dha Ni
3. Thāt Bhairavi - Sa Re Ga Ma Pa Dha Ni
4. Thāt Bilaval - Sa Re Ga Ma Pa Dha Ni
5. Thāt Kafi - Sa Re Ga Ma Pa Dha Ni
6. Thāt Kalyan - Sa Re Ga $\overline{M}$a Pa Dha Ni
7. Thāt Khammaj - Sa Re Ga Ma Pa Dha Ni
8. Thāt Marava - Sa Re Ga $\overline{M}$a Pa Dha Ni
9. Thāt Pooravi - Sa Re Ga $\overline{M}$a Pa Dha Ni
10. Thāt Todi - Sa Re Ga $\overline{M}$a Pa Dha Ni

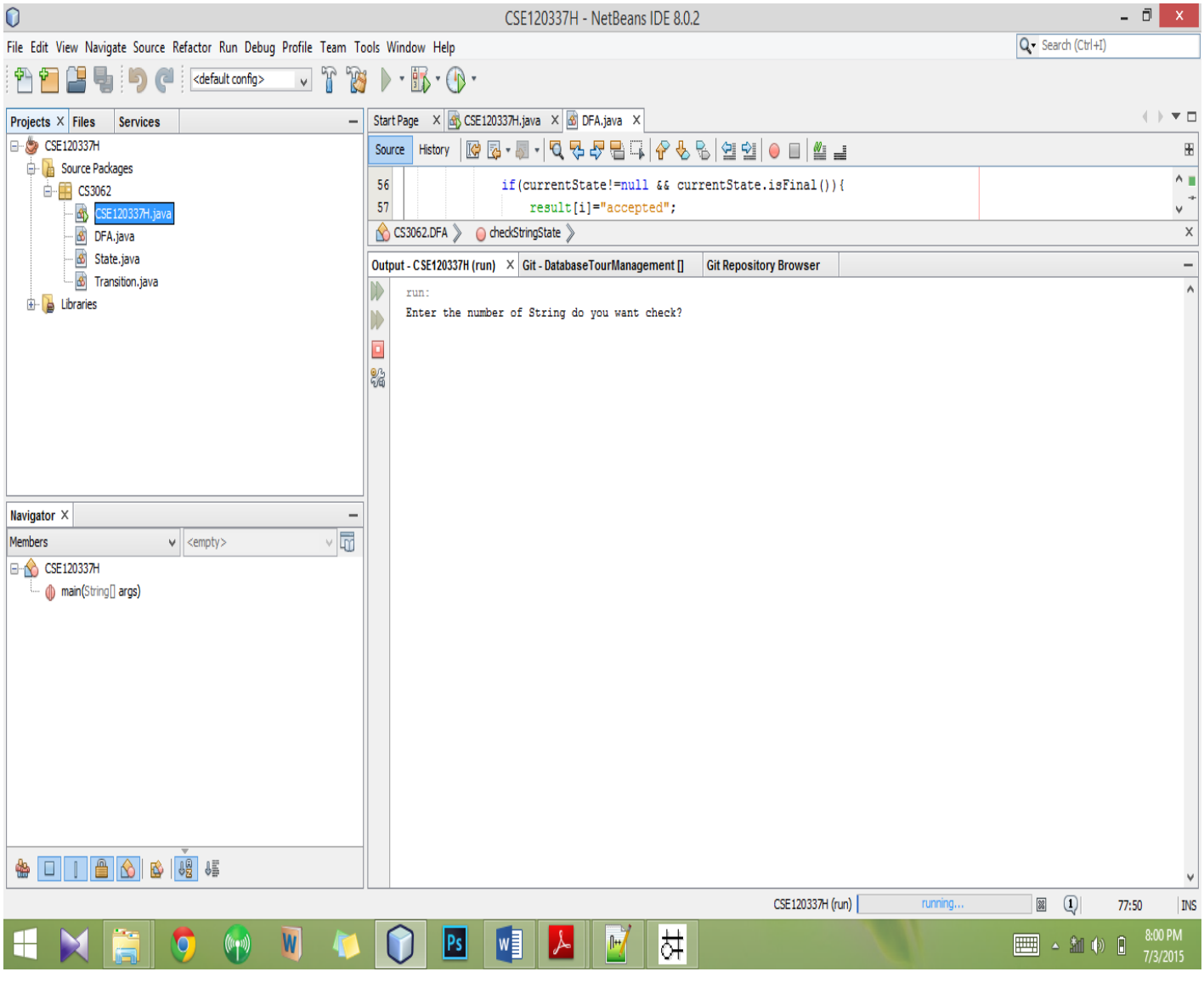
Let consider

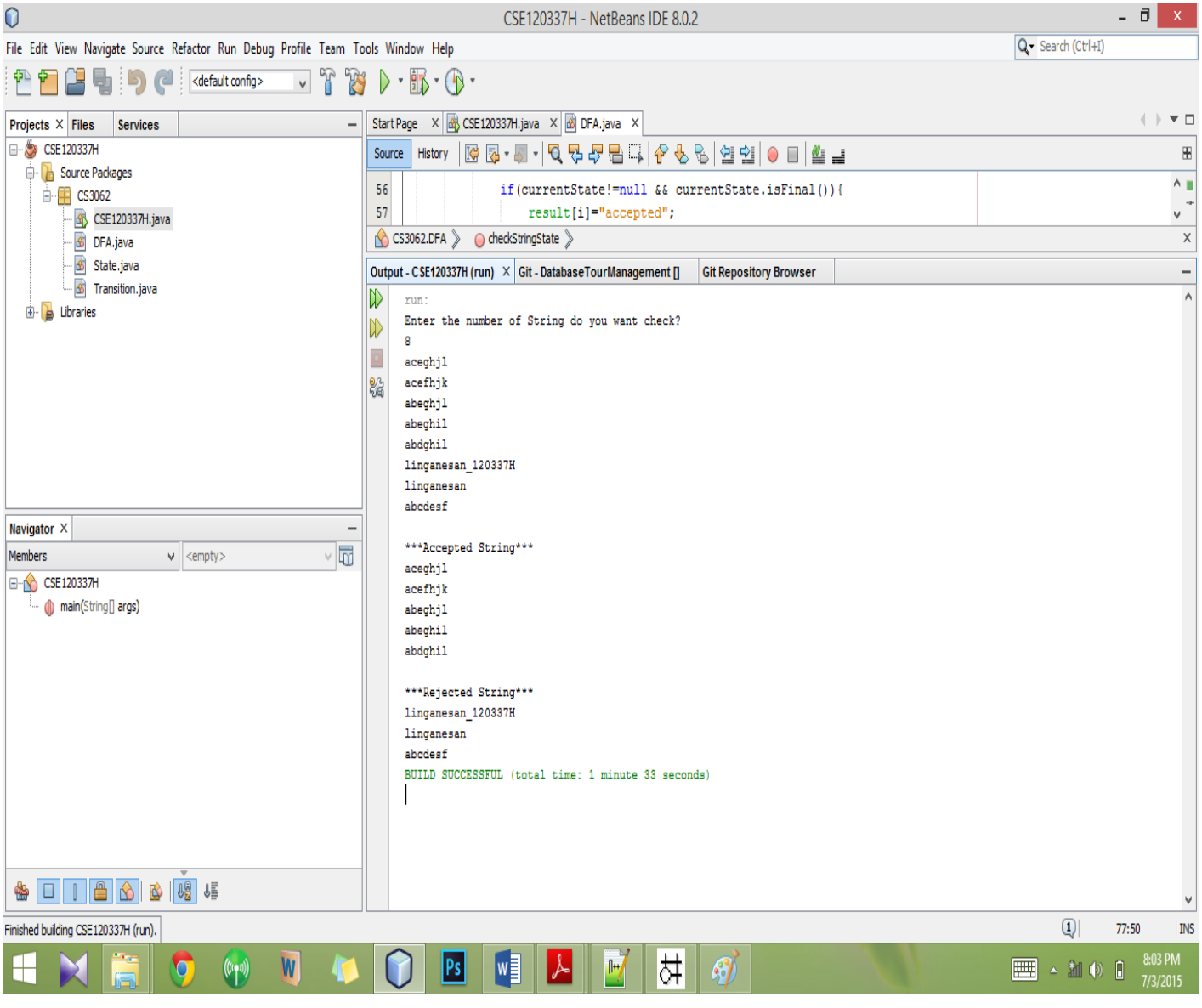
Sa	Re	Re	Ga	Ga	Ma	$\overline{M}$a	Pa	Dha	Dha	Ni	Ni
a	b	c	d	e	f	g	h	i	j	k	l

Then

1. Thāt Asavari - a c d f h i l
2. Thāt Bhairava - a b e f h i l
3. Thāt Bhairavi - a b d f h i k
4. Thāt Bilaval - a c e f h j l
5. Thāt Kafi - a c d f h j k
6. Thāt Kalyan - a c e g h j l
7. Thāt Khammaj - a c e f h j k
8. Thāt Marava - a b e g h j l
9. Thāt Pooravi - a b e g h i l
10. Thāt Todi - a b d g h i l


S0
a
S1
b
c
S2
S3
d
e
d
e
S4
S5
S6
S7
f
g
f
g
f
f
g
S8
S9
S10
S11
S12
S13
S14
h
h
h
h
h
h
h
S16
i
j
k
k
S17
S18
S19
l
l


CSE120337H - NetBeans IDE 8.0.2
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Search (Ctrl+I)
<default config>
Projects
Files
Services
CSE120337H
Source Packages
CS3062
CSE120337H.java
DFA.java
State.java
Transition.java
Libraries
Navigator
Members
<empty>
CSE120337H
main(String[] args)
Start Page
CSE120337H.java
DFA.java
Source
History
56 if(currentState!=null && currentState.isFinal()){
57 result[i]="accepted";
CS3062.DFA
checkStringState
Output - CSE120337H (run)
Git - DatabaseTourManagement []
Git Repository Browser
run:
Enter the number of String do you want check?
CSE120337H (run)
running...
77:50
INS
8:00 PM
7/3/2015


CSE120337H - NetBeans IDE 8.0.2
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Search (Ctrl+I)
<default config>
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CSE120337H
Source Packages
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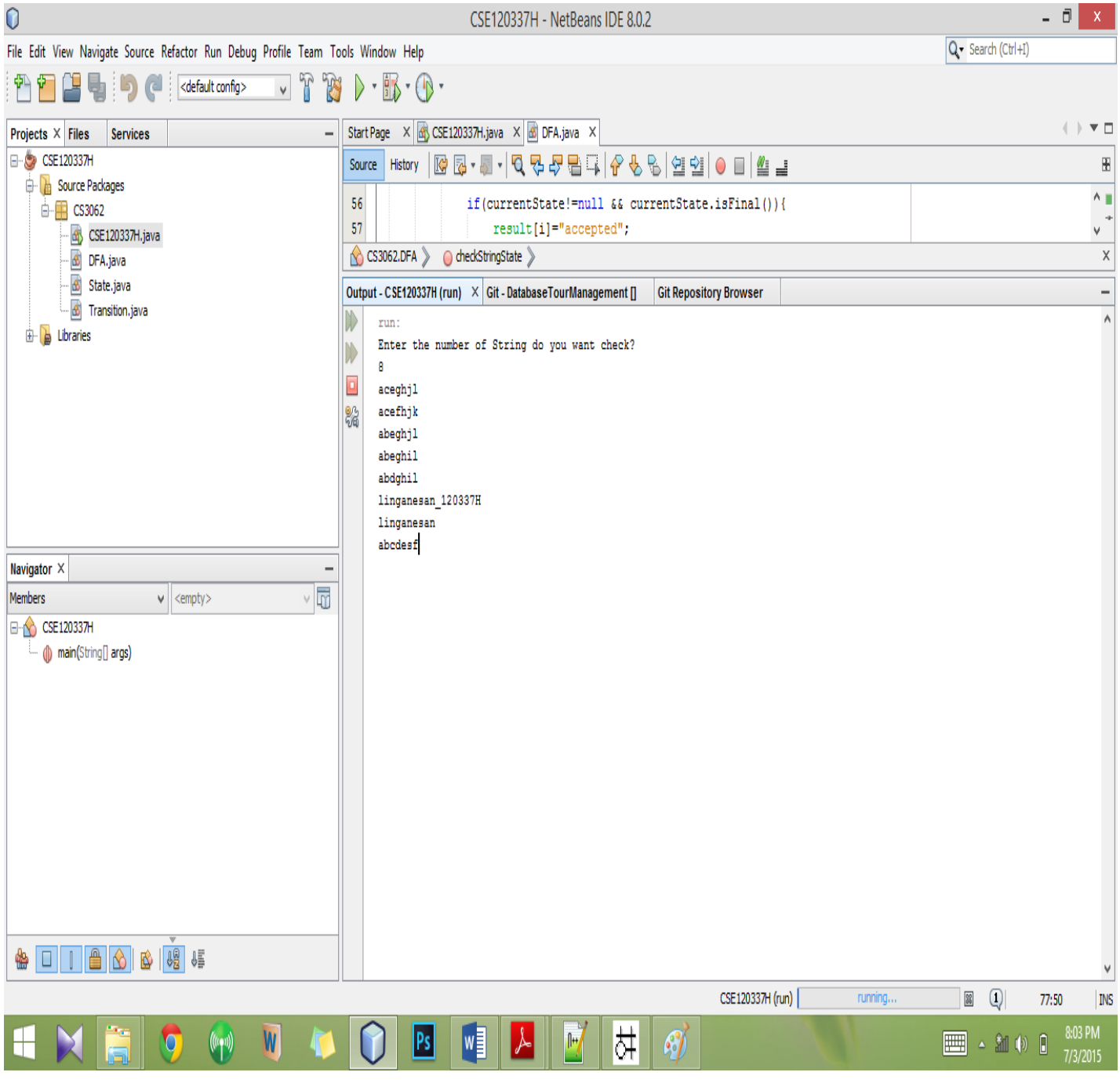
Transition.java
Libraries
Navigator
Members
<empty>
CSE120337H
main(String[] args)
Start Page
CSE120337H.java
DFA.java
Source History
56 if(currentState!=null && currentState.isFinal()){
57 result[i]="accepted";
CS3062.DFA
checkStringState
Output - CSE120337H (run)
Git - DatabaseTourManagement []
Git Repository Browser
run:
Enter the number of String do you want check?
8
aceghjl
acefhjk
abeghjl
abeghil
abdghil
linganesan_120337H
linganesan
abcdesf
Accepted String
aceghjl
acefhjk
abeghjl
abeghil
abdghil
Rejected String
linganesan_120337H
linganesan
abcdesf
BUILD SUCCESSFUL (total time: 1 minute 33 seconds)
Finished building CSE120337H (run).
77:50
INS
8:03 PM
7/3/2015


CSE120337H - NetBeans IDE 8.0.2
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Search (Ctrl+I)
<default config>
Projects
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CS3062
CSE120337H.java
DFA.java
State.java
Transition.java
Libraries
Navigator
Members
<empty>
CSE120337H
main(String[] args)
Start Page
CSE120337H.java
DFA.java
Source
History
56 if(currentState!=null && currentState.isFinal()){
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CS3062.DFA
checkStringState
Output - CSE120337H (run)
Git - DatabaseTourManagement []
Git Repository Browser
run:
Enter the number of String do you want check?
8
aceghjl
acefhjk
abeghjl
abeghil
abdghil
linganesan_120337H
linganesan
abcdesf
CSE120337H (run)
running...
77:50
INS
8:03 PM
7/3/2015