Bapuji Educational Association (Regd.)
Bapuji Institute of Engineering and Technology, Davangere
Department of Information Science and Engineering
2024-25
Theory of Computation (BCS503)

Conducted a session to give awareness about JFLAP tool usage for better understanding the problems of finite automata. JFLAP tool is

JFLAP (Java Formal Languages and Automata Package) is an interactive software tool designed to help students and educators explore topics in **formal languages and automata theory**. JFLAP provides a visual and hands-on environment to simulate and analyze a wide range of computational models.

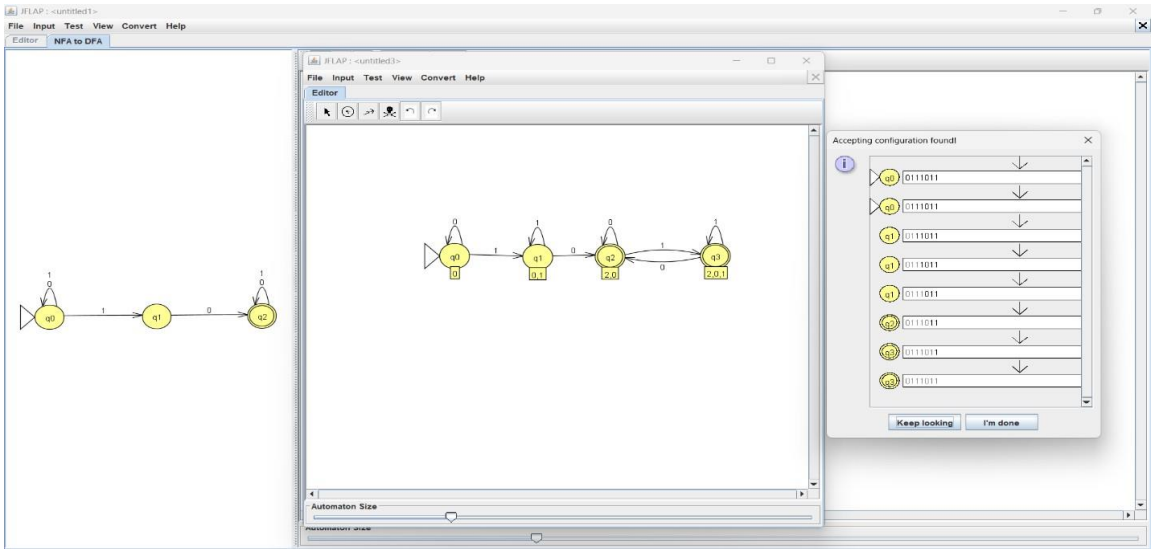
Following are the different key features of JFLAP tool:

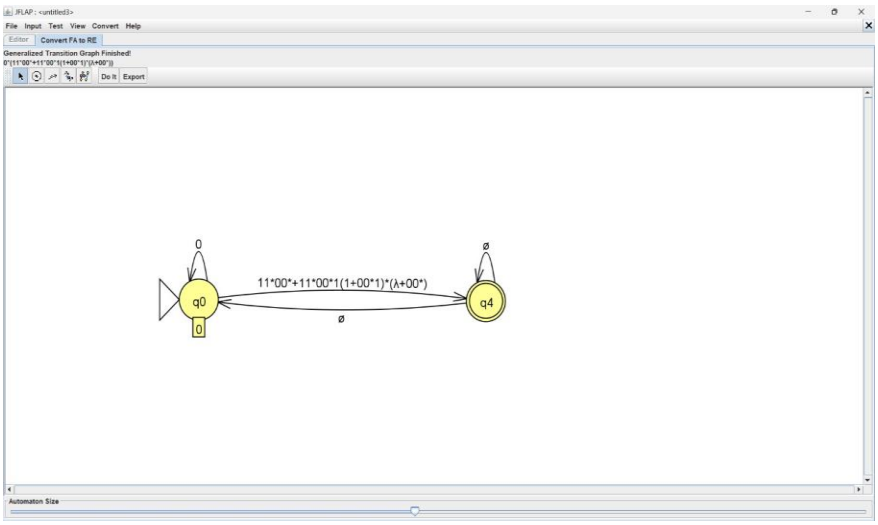
- Design finite automata DFA or NFA, PDA and Turing Machine.
- Convert NFA to DFA and regular expression.
- Convert the grammar CFG to CNF
- Verify the language is regular
- Step by step tracing and designing of automata

Benefits:

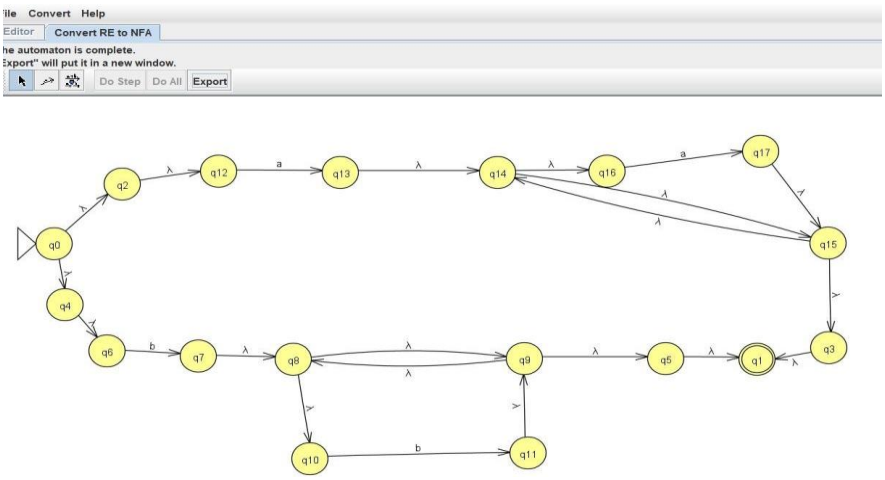
- Enhances conceptual understanding through visual learning
- Encourages experimentation with theoretical models
- Supports stepwise execution for better clarity of transitions and states

1. Design an NFA which accepts strings containing substring 10, convert it to DFA. Demonstrate the trace with an example string. Obtain the regular expression for constructed DFA.

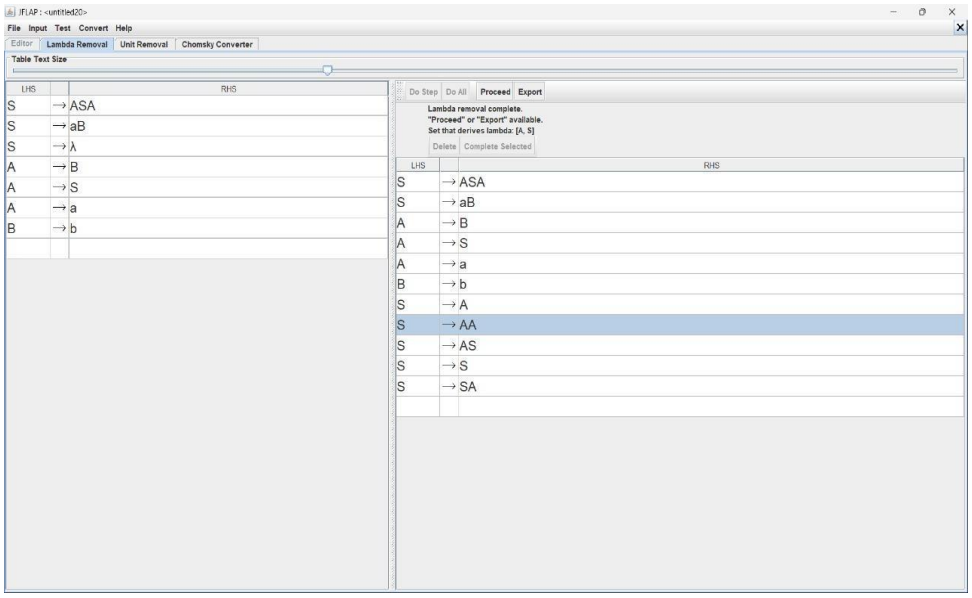


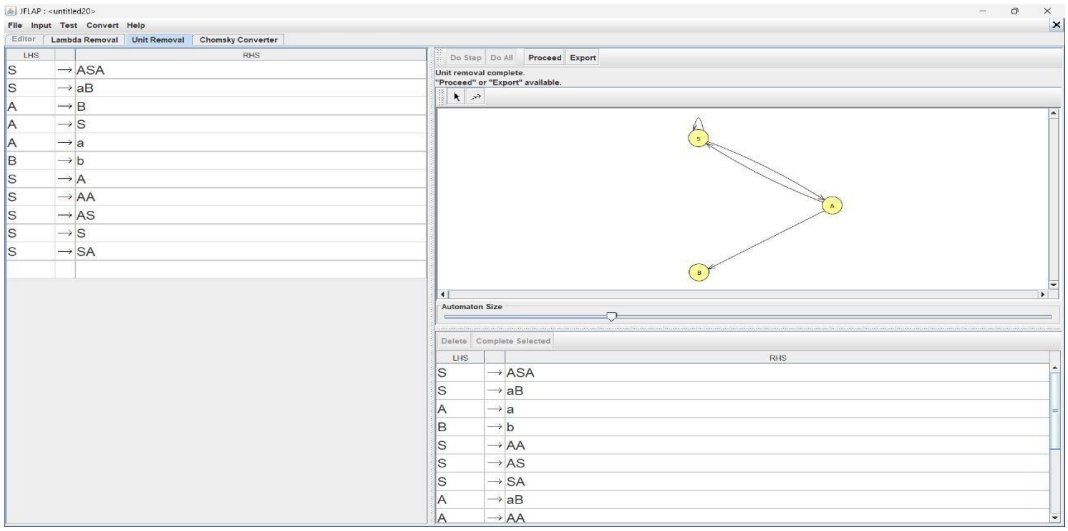


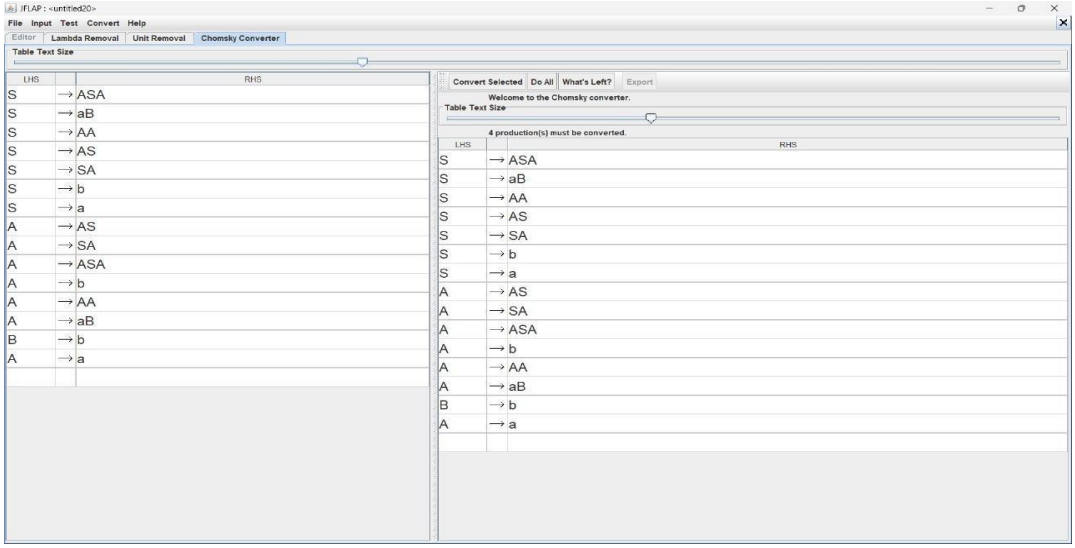
2 Construct Finite Automata for a regular expression aa*+bb*

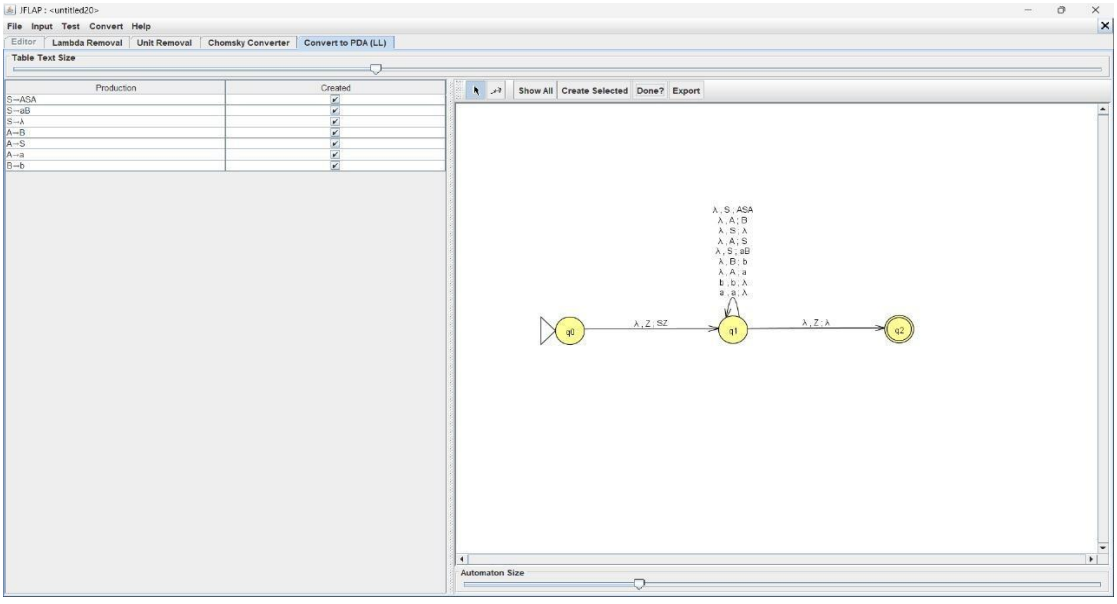


3 Convert the grammar (which contains Epsilon transition, useless symbols, unit production) to CNF and also to PDA. Demonstrate a trace with an example string.

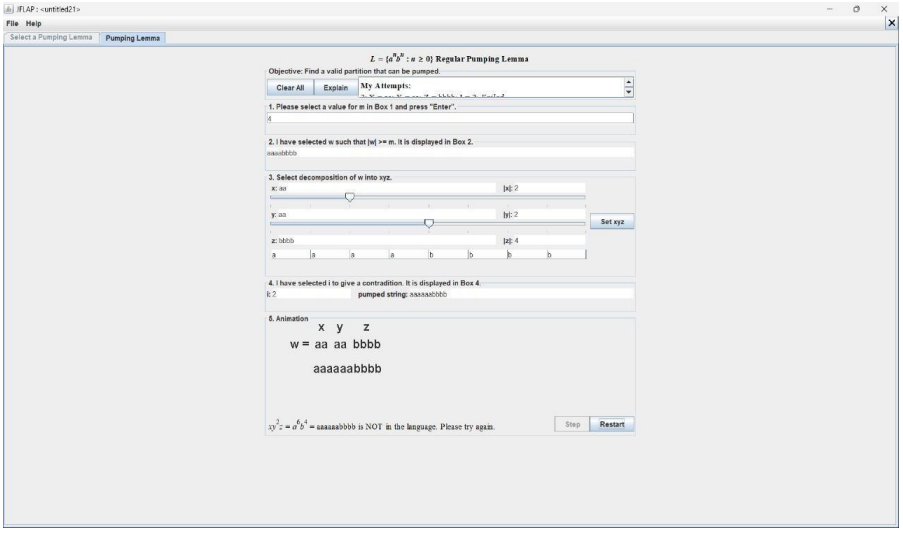


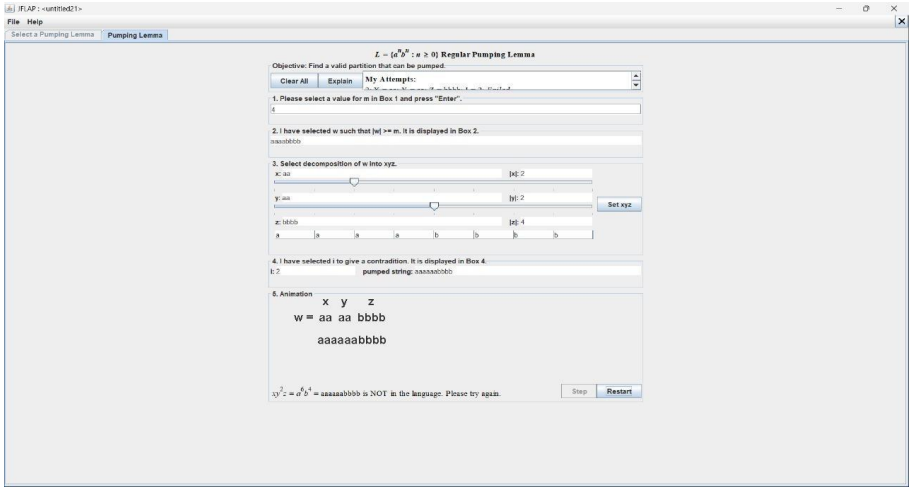

JFLAP : <untitled20>
File Input Test Convert Help
Editor Lambda Removal Unit Removal Chomsky Converter
LHS RHS
S → ASA
S → aB
A → B
A → S
A → a
B → b
S → A
S → AA
S → AS
S → S
S → SA
Do Step Do All Proceed Export
Unit removal complete.
"Proceed" or "Export" available.
Automaton Size
Delete Complete Selected
LHS RHS
S → ASA
S → aB
A → a
B → b
S → AA
S → AS
S → SA
A → aB
A → AA


JFLAP : <untitled20>
File Input Test Convert Help
Editor Lambda Removal Unit Removal Chomsky Converter
Table Text Size
LHS RHS
S → ASA
S → aB
S → AA
S → AS
S → SA
S → b
S → a
A → AS
A → SA
A → ASA
A → b
A → AA
A → aB
B → b
A → a
Convert Selected Do All What's Left? Export
Welcome to the Chomsky converter.
Table Text Size
4 production(s) must be converted.
LHS RHS
S → ASA
S → aB
S → AA
S → AS
S → SA
S → b
S → a
A → AS
A → SA
A → ASA
A → b
A → AA
A → aB
B → b
A → a

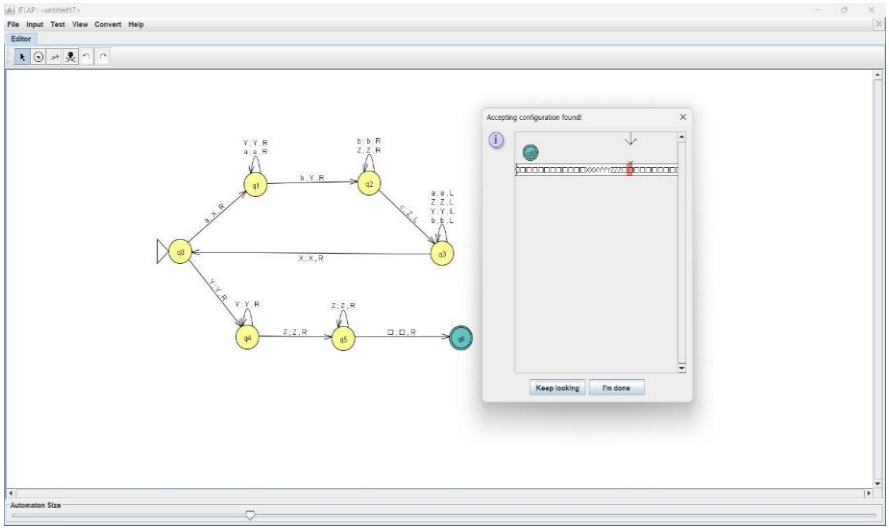

JFLAP : <untitled20>
File Input Test Convert Help
Editor Lambda Removal Unit Removal Chomsky Converter Convert to PDA (LL)
Table Text Size
Production Created
S-->ASA
S-->aB
S-->A
A-->B
A-->S
A-->a
B-->b
Show All Create Selected Done? Export
λ , S : ASA
λ , A : B
λ , S : λ
λ , A : S
λ , S : aB
λ , B : b
λ , A : a
b , b : λ
a , a : λ
q0
λ , Z : SZ
q1
λ , Z : λ
q2
Automaton Size

4. Demonstrate the language is not a regular and not a context free with an example for each.





5. Design Turing Machine for L={a^n b^n c^n| n>=1} and demonstrate the trace with an example.



Course Coordinator

Program Coordinator