**G. H. RAISONI COLLEGE OF ENGG., NAGPUR**

**(An Autonomous Institute)**

**Department of Computer Science & Engg.**



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**Practical Subject: COMPILER DESIGN**

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**Practical Details: Practical Number-5;**

| Practical Aim | Write a LEX program Finite automata that accepts string having even number’s of ‘a’ over input alphabet {a,b} |
| --- | --- |
| Theory & Syntax | Introduction :  In this article, we will discuss the DFA in LEX Code that accepts the string having even number’s of ‘a’ over input alphabet {a, b}. with the help of example. Let’s discuss it one y one.  Problem Overview :  LEX Code that accepts the string having even number’s of ‘a’ over input alphabet {a, b}.  Example –  Input : aba  Output: Accepted  Input : ababba  Output: Not Accepted  Input: 23ab  Output:Invalid  Input:ab345  Output:Invalid  Input:aabababa  Output:Not Accepted  Approach :  LEX provides us with an INITIAL state by default. So to make a DFA, use this as the initial state of the DFA.  We define two more states – A and DEAD, where the DEAD state would be used if encountering a wrong or invalid input. When the user inputs an invalid character, move to DEAD state, and then print “Invalid”.  If the input string ends at A then display the message “Not Accepted”. Else if the input string ends at state INITIAL, then displays the message “Accepted”.  Note :  To compile the lex program we need to have a Unix system that has flex installed into it. Then we need to save the file with the .l extension.  Example - filename.l  Then after saving the program closes the Lex file and then open the terminal and write the following commands as follows.  lex filename.l  cc lex.yy.c  ./a.out |
| Program | %{  %}  %s A DEAD  %%  <INITIAL>a BEGIN A;  <INITIAL>b BEGIN INITIAL;  <INITIAL>[^ab\n] BEGIN DEAD;  <INITIAL>\n BEGIN INITIAL; {printf("Accepted\n");}  <A>a BEGIN INITIAL;  <A>b BEGIN A;  <A>[^ab\n] BEGIN DEAD;  <A>\n BEGIN INITIAL; {printf("Not Accepted\n");}  <DEAD>[^\n] BEGIN DEAD;  <DEAD>\n BEGIN INITIAL; {printf("Invalid\n");}  %%  int yywrap()  {  return 1;  }  int main()  {  printf("Enter String\n");  yylex();  return 0;  } |
| Output |  |
| Conclusion | Performed and executed lex program to Finite automata that accepts string having even number’s of ‘a’ over input alphabet {a,b} |