# COMPILER DESIGN LAB
## CIC – 351

Faculty Name:

Dr Deepak Gupta

Name: Gautam Tuteja

Roll no.: 04196402721

Semester: 5th (3rd year)

Group: 5C13

# Maharaja Agrasen Institute of Technology, PSP Area,

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# PRACTICAL RECORD

**PAPER CODE**         :      **CIC – 351**

Name of Student         :      GAUTAM TUTEJA

University roll          :      04196402721

Semester               :      $5^{th}$ ($3^{rd}$ year)

Group                  :      5C13

# PRACTICAL DETAILS

Experiments according to the lab syllabus prescribed by GGSIPU

| Exp. no | Experiment Name | Date of performance | Date of checking | R1 (3) | R2 (3) | R3 (3) | R4 (3) | R5 (3) | Total Marks (15) | Signature |
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**EXPERIMENT – 2.1**                                    **DATE : 13-09-2023**
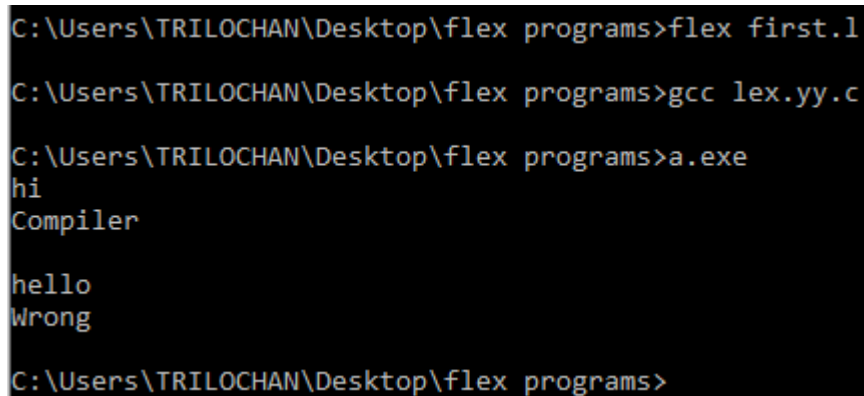

**AIM :** Write a lex program to print "Compiler" when "hi" is input string.


**SOURCE CODE:**

```
%{
#include <stdio.h>
%}
%%
hi { printf("Compiler\n"); }
.* { printf("Wrong"); }
%%
int yywrap(){}
int main() {
    yylex();
    return 0;
}
```


**OUTPUT:**

**EXPERIMENT – 2.2**                                    **DATE : 13-09-2023**

**AIM :** Write a lex program to count number of capital letters in a given string.

**SOURCE CODE:**

```
%{
int count = 0;
%}


%%
[A-Z] {printf("%s capital letter\n", yytext);
    count++;}
.   {printf("%s not a capital letter\n", yytext);}
\n  {return 0;}
%%


int yywrap(){}
int main(){
yylex();
printf("\nNumber of Capital letters "
    "in the given input : %d\n", count);


return 0;
}
```

**OUTPUT:**

```
C:\Users\TRILOCHAN\Desktop\flex programs>flex second.l

C:\Users\TRILOCHAN\Desktop\flex programs>gcc lex.yy.c

C:\Users\TRILOCHAN\Desktop\flex programs>a.exe
Hello From COMPILER
H capital letter
e not a capital letter
l not a capital letter
l not a capital letter
o not a capital letter
  not a capital letter
F capital letter
r not a capital letter
o not a capital letter
m not a capital letter
  not a capital letter
C capital letter
O capital letter
M capital letter
P capital letter
I capital letter
L capital letter
E capital letter
R capital letter

Number of Capital letters in the given input : 10

C:\Users\TRILOCHAN\Desktop\flex programs>
```

## VIVA-VOCE QUESTIONS:

**Ques 1. What is Lex?**

**Ans 1.** Lex is a tool used to generate lexical analyzers (scanners) for parsing text input.

**Ques 2. What is a Lex rule pattern?**

**Ans 2.** A Lex rule pattern is a regular expression that describes the text to be matched in the input.

**Ques 3. How do you specify the action to be taken when a Lex pattern is matched?**

**Ans 3.** Actions in Lex are written in C code enclosed in curly braces '{ }' and placed after the pattern.

**Ques 4. What does the double percentage symbols (%%) signify in a Lex program?**

**Ans 4.** The double percentage symbols (%%) in a Lex program separate the lexical rules from the actions.

**Ques 5. How can you compile and execute a Lex program?**

**Ans 5.** Use lex to generate a C source file, then compile it using a C compiler (e.g., gcc) binary. and execute the resulting.

# MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

## VISION

**To nurture young minds in a learning environment of high academic value and imbibe spiritual and ethical values with technological and management competence.**

## MISSION

**The Institute shall endeavor to incorporate the following basic missions in the teaching methodology:**

❖ **Engineering Hardware – Software Symbiosis:** Practical exercises in all Engineering and Management disciplines shall be carried out by Hardware equipment as well as the related software enabling deeper understanding of basic concepts and encouraging inquisitive nature.

❖ **Life – Long Learning:** The Institute strives to match technological advancements and encourage students to keep updating their knowledge for enhancing their skills and inculcating their habit of continuous learning.

❖ **Liberalization and Globalization:** The Institute endeavors to enhance technical and management skills of students so that they are intellectually capable and competent professionals with Industrial Aptitude to face the challenges of globalization.

❖ **Diversification:** The Engineering, Technology and Management disciplines have diverse fields of studies with different attributes. The aim is to create a synergy of the above attributes by encouraging analytical thinking.

❖ **Digitization of Learning Processes:** The Institute provides seamless opportunities for innovative learning in all Engineering and Management disciplines through digitization of learning processes using analysis, synthesis, simulation, graphics, tutorials and related tools to create a platform for multi-disciplinary approach.

❖ **Entrepreneurship:** The Institute strives to develop potential Engineers and Managers by enhancing their skills and research capabilities so that they emerge as successful entrepreneurs and responsible citizens.

# MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

*AICTE Approved and Affiliated to GGSIPU, ISO Certified, NBA Accredited(CSE,ECE,MAE)*

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

## VISION

To be Centre of excellence in education, research and technology transfer in the field of computer engineering and promote entrepreneurship and ethical values.

## MISSION

To foster an open, multidisciplinary and highly collaborative research environment for producing world-class engineers capable of providing innovative solutions to real-life problems and fulfil societal needs.

## Program Specific Outcomes (PSOs)

PSO1: Capable of identifying the appropriate data structure and algorithms to design, implement and test effective solutions for real-world and research problems.

PSO2: Capable of excelling in a variety of programming/project competitions as well as technical challenges set out by professional societies.

PSO3: Capable to gain knowledge in diverse areas of Computer Science and apply that to a successful career, entrepreneurship and higher education.

## Program Educational Objectives (PEO)

PEO1: Our graduates will have successful careers in the computer engineering field or be able to successfully pursue advanced degrees.

PEO2: Our graduates will have the ability to provide innovative solutions to real-world challenging problems by applying computer engineering principles.

PEO3: Our graduates will be able to Communicate effectively, work collaboratively and exhibit high levels of professionalism and ethical responsibilities.

PEO4: Our graduates will be able to identify research gaps, engage in life long learning and be a successful entrepreneur.

# Department of Computer Science and Engineering
## Rubrics for Lab Assessment

| Rubrics | 0 Missing | 1 Inadequate | 2 Needs Improvement | 3 Adequate |
|---|---|---|---|---|
| R1 Is able to identify the problem to be solved and define the objectives of the experiment. | No mention is made of the problem to be solved. | An attempt is made to identify the problem to be solved but it is described in a confusing manner, objectives are not relevant, objectives contain technical/ conceptual errors or objectives are not measurable. | The problem to be solved is described but there are minor omissions or vague details. Objectives are conceptually and measurable but written using correct technical terminology and are free from linguistic errors. | The problem to be solved is clearly stated. Objectives are complete, specific, concise, and measurable. They may be incomplete in scope or have linguistic errors. |
| R2 Is able to design a reliable experiment that solves the problem. | The experiment does not solve the problem. | The experiment attempts to solve the problem but due to the nature of the design the data will not lead to a reliable solution. | The experiment attempts to solve the problem but due to the nature of the design there is a moderate chance the data that will not lead to a reliable solution. | The experiment solves the problem and has a high likelihood of producing data that will lead to a reliable solution. |
| R3 Is able to communicate the details of an experimental procedure clearly and completely. | Diagrams are missing and/or experimental procedure is missing or extremely vague. | Diagrams are present but unclear and/or experimental procedure is present but important details are missing. | Diagrams and/or experimental procedure are present but with minor omissions or vague details. | Diagrams and/or experimental procedure are clear and complete. |
| R4 Is able to record and represent data in a meaningful way. | Data are either absent or incomprehensible. | Some important data are absent or incomprehensible. | All important data are present, but recorded in a way that requires some effort to comprehend. | All important data are present, organized and recorded clearly. |
| R5 Is able to make a judgment about the results of the experiment. | No discussion is presented about the results of the experiment . | A judgment is made about the results, but it is not reasonable or coherent. | An acceptable judgment is made about the result, but the reasoning is flawed or incomplete. | An acceptable judgment is made about the result, with clear reasoning. The effects of assumptions and experimental uncertainties are considered. |