Parul University

FACULTY OF ENGINEERING AND TECHNOLOGY

Compiler Design Laboratory (303105350)

6th SEMESTER (3rd YEAR)

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

Laboratory Manual

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY
PARUL INSTITUTE OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

STUDENT DETAILS

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SUBJECT	:	COMPILER DESIGN LABORATORY
SUBJECT CODE	:	303105350
SEMESTER	:	6TH

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BACHELOR OF TECHNOLOGY

CERTIFICATE

This is to certify that MR THAKAR AARYA RUSHIKESH with Enrollment no. 2303031050636 has Successfully completed his/her Laboratory Experiments in the Compiler Design (203105350) from the Department of Computer Science and Engineering during the academic year 2025-2026.

Date of Submission: ....

Staff In charge: .... **Head of Department: ....**

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10	Implement following programs using Lex. a. Write a Lex program to print out all numbers from the given file. b. Write a Lex program to printout all HTML tags in file. c. Write a Lex program which adds line numbers to the given file and display the same onto the standard output.						

Practical - 1

Aim:- Project Definition and objective of the specified module and perform requirement engineering process.

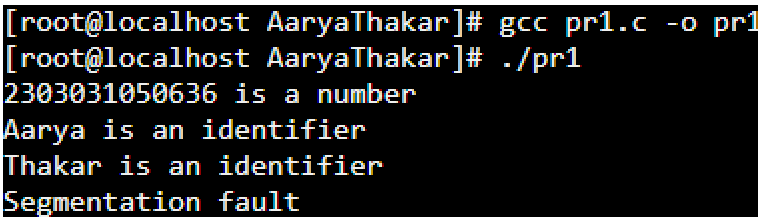
main.c

```
#include <stdio.h>
#include <ctype.h>
#include <string.h>
#include <stdlib.h>

void keyw(char *p);

int i = 0, id = 0, kw = 0, num = 0, op = 0, sp = 0, ar = 0, count = 0, new_line = 0;

char keys[32][10] = {
    "auto","break","case","char","const","continue","default","do",
    "double","else","enum","extern","float","for","goto","if","int",
    "long","register","return","short","signed","sizeof","static",
    "struct","switch","typedef","union","unsigned","void","volatile","while"
};

int main()
{
    char ch, str[25];
    char seps[20] = " \t\n,;(){}[]#\"<>";
    char oper[] = "!%^&*-+=~|.<>/?";
    int j;

    FILE *f1 = fopen("sample1.txt", "r");
    if (f1 == NULL)
    {
        printf("File not found\n");
        exit(0);
    }

    while ((ch = fgetc(f1)) != EOF)
    {
        for (j = 0; j <= 14; j++)
        {
            if (ch == oper[j])
            {
                printf("%c is an operator\n", ch);
                op++;
                count++;

                str[i] = '\0';
                keyw(str);
            }
        }
        if (ch == '\n')
            new_line++;
        for (j = 0; j <= 14; j++)
        {
            if (i == -1)
                break;

            if (ch == seps[j])
            {
                if (ch == '#')
                {
                    while (ch != '>')
                    {
                        printf("%c", ch);
                        ch = fgetc(f1);
                    }
                    printf("%c is a header file\n", ch);

                    i = -1;
                    break;
                }
                if (ch == '"')
                {
                    do {
                        ch = fgetc(f1);
                        printf("%c", ch);
                    } while (ch != '"');

                    printf("\b is an argument\n");
                    ar++;
                    count++;
                    i = -1;
                    break;
                }
                if (ch == ',' || ch == ';' || ch == '(' || ch == ')' ||
                    ch == '{' || ch == '}' || ch == '[' || ch == ']')
                {
                    printf("%c is a Separator\n", ch);
                    sp++;
                    count++;
                }

                str[i] = '\0';
                keyw(str);
            }
        }
        if (i != -1)
        {
            str[i] = ch;
            i++;
        }
        else
            i = 0;
    }
    printf("\nKeywords: %d", kw);
    printf("\nIdentifiers: %d", id);
    printf("\nOperators: %d", op);
    printf("\nNumbers: %d", num);
    printf("\nSeparators: %d", sp);
    printf("\nArguments: %d", ar);
    printf("\nTotal Tokens: %d", count);
    printf("\nNumber of Lines: %d\n", new_line);

    return 0;
}
void keyw(char *p)
{
    int k, flag = 0;
    for (k = 0; k <= 31; k++)
    {
        if (strcmp(keys[k], p) == 0)
        {
            printf("%s is a keyword\n", p);
            kw++;
            count++;
            flag = 1;
            break;
        }
    }

    if (flag == 0)
    {
        if (isdigit(p[0]))
        {
            printf("%s is a number\n", p);
            num++;
            count++;
        }
        else
        {
            if (p[0] != '\0')
            {
                printf("%s is an identifier\n", p);
                id++;
                count++;
            }
        }
    }

    i = -1;
}
```

Sample1.txt

2303031050636 Aarya Thakar

Output:



```
[root@localhost AaryaThakar]# gcc pr1.c -o pr1
[root@localhost AaryaThakar]# ./pr1
2303031050636 is a number
Aarya is an identifier
Thakar is an identifier
Segmentation fault
```

Practical - 2

Aim:- Program to count digits, vowels and symbols in C.

main.c

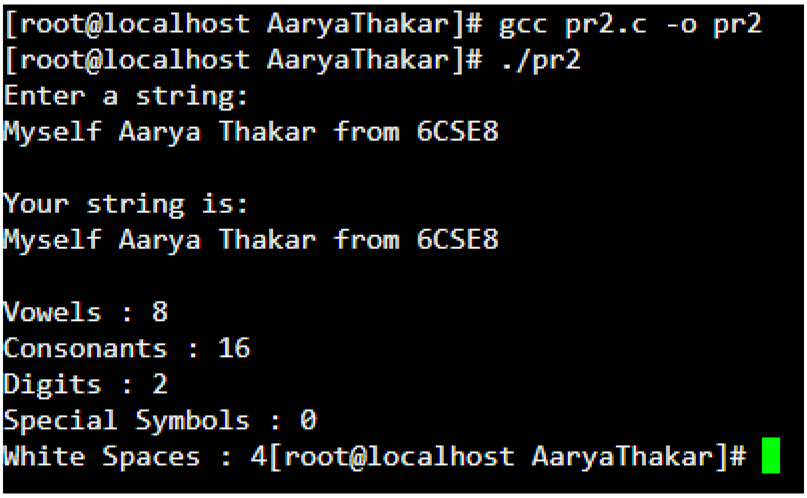
```
#include <stdio.h>
#include <string.h>

int main()
{
   char str[100];
   int i;
   int vowels = 0, consonant = 0, digit = 0, symbols = 0, spaces = 0;

   printf("Enter a string:\n");
   fgets(str, sizeof(str), stdin);

   printf("\nYour string is:\n");
   printf("%s", str);

   for (i = 0; str[i] != '\0'; i++)
   {
      if (str[i] == 'a' || str[i] == 'A' ||
         str[i] == 'e' || str[i] == 'E' ||
         str[i] == 'i' || str[i] == 'I' ||
         str[i] == 'o' || str[i] == 'O' ||
         str[i] == 'u' || str[i] == 'U')
      {
         vowels++;
      }
      else if ((str[i] >= 'a' && str[i] <= 'z') ||
              (str[i] >= 'A' && str[i] <= 'Z'))
      {
         consonant++;
      }
      else if (str[i] >= '0' && str[i] <= '9')
      {
         digit++;
      }
      else if (str[i] == ' ')
      {
         spaces++;
      }
      else if (str[i] != '\n')   // ignore newline from fgets
      {
         symbols++;
      }
   }

   printf("\nVowels : %d", vowels);
   printf("\nConsonants : %d", consonant);
   printf("\nDigits : %d", digit);
```

```
    printf("\nSpecial Symbols : %d", symbols);
    printf("\nWhite Spaces : %d", spaces);

    return 0;
}
```

input.txt

MySelf Aarya Thakar from 6CSE8

Output:



```
[root@localhost AaryaThakar]# gcc pr2.c -o pr2
[root@localhost AaryaThakar]# ./pr2
Enter a string:
Myself Aarya Thakar from 6CSE8

Your string is:
Myself Aarya Thakar from 6CSE8

Vowels : 8
Consonants : 16
Digits : 2
Special Symbols : 0
White Spaces : 4[root@localhost AaryaThakar]#
```

Practical - 3

Aim:- Program to check validation of User Name and Password in C.

main.c

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
int main() {
    char username[25], password[20];
    int i, flag;
    FILE *fp, *fp1;
    fp = fopen("user.txt", "r");
    if (fp == NULL) {
        printf("User file not opened\n");
        exit(1);
    }
    fgets(username, 25, fp);
    username[strcspn(username, "\n")] = '\0';  // remove newline
    fclose(fp);
    printf("Your Username is: %s\n", username);
    if (strcmp(username, "AaryaThakar") == 0 ||
        strcmp(username, "ThakarAarya") == 0 ||
        strcmp(username, "AaryaRThakar") == 0 ||
        strcmp(username, "RAaryaThakar") == 0) {
        printf("This Username already exists.\n");
        return 0;
    }
    if (username[0] < 'A' || username[0] > 'Z') {
        printf("First character must be capital.\n");
        return 0;
    }
    for (i = 0; username[i] != '\0'; i++) {
        if (username[i] >= '0' && username[i] <= '9') {
            printf("Digits are not allowed in username.\n");
            return 0;
        }
    }
    for (i = 0; username[i] != '\0'; i++) {
        if (strchr("~!@#$%^&*", username[i])) {
            printf("Special symbols not allowed in username.\n");
            return 0;
        }
    }
    fp1 = fopen("pass.txt", "r");
    if (fp1 == NULL) {
        printf("Password file not opened\n");
        exit(1);
    }
    fgets(password, 20, fp1);
    password[strcspn(password, "\n")] = '\0';
    fclose(fp1);
    printf("Your Password is: %s\n", password);
    if (strlen(password) < 8 || strlen(password) > 15) {
        printf("Password length must be 8 to 15 characters.\n");
        return 0;
    }
    flag = 0;
    for (i = 0; password[i] != '\0'; i++) {
        if (password[i] >= '0' && password[i] <= '9') {
            flag = 1;
            break;
        }
    }
    if (!flag) {
        printf("Password must contain at least one digit.\n");
        return 0;
    }
    flag = 0;
    for (i = 0; password[i] != '\0'; i++) {
        if (strchr("~!@#$%^&*", password[i])) {
            flag = 1;
            break;
        }
    }
    if (!flag) {
        printf("Password must contain at least one special symbol.\n");
        return 0;
    }
    for (i = 0; password[i] != '\0'; i++) {
        if (password[i] == ' ') {
            printf("Password should not contain spaces.\n");
            return 0;
        }
    }
    printf("\nUsername and Password created successfully.");
    return 0;
}
```

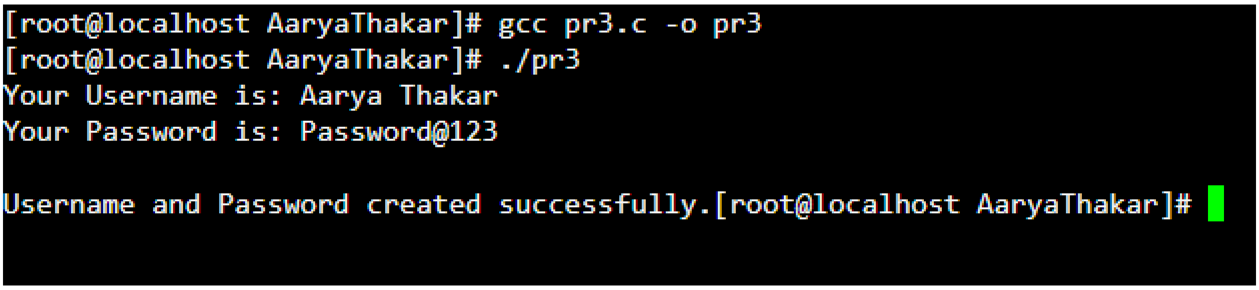
user.txt

Aarya Thakar

pass.txt

Password@123

Output



```
[root@localhost AaryaThakar]# gcc pr3.c -o pr3
[root@localhost AaryaThakar]# ./pr3
Your Username is: Aarya Thakar
Your Password is: Password@123

Username and Password created successfully.[root@localhost AaryaThakar]#
```