

Practical-1

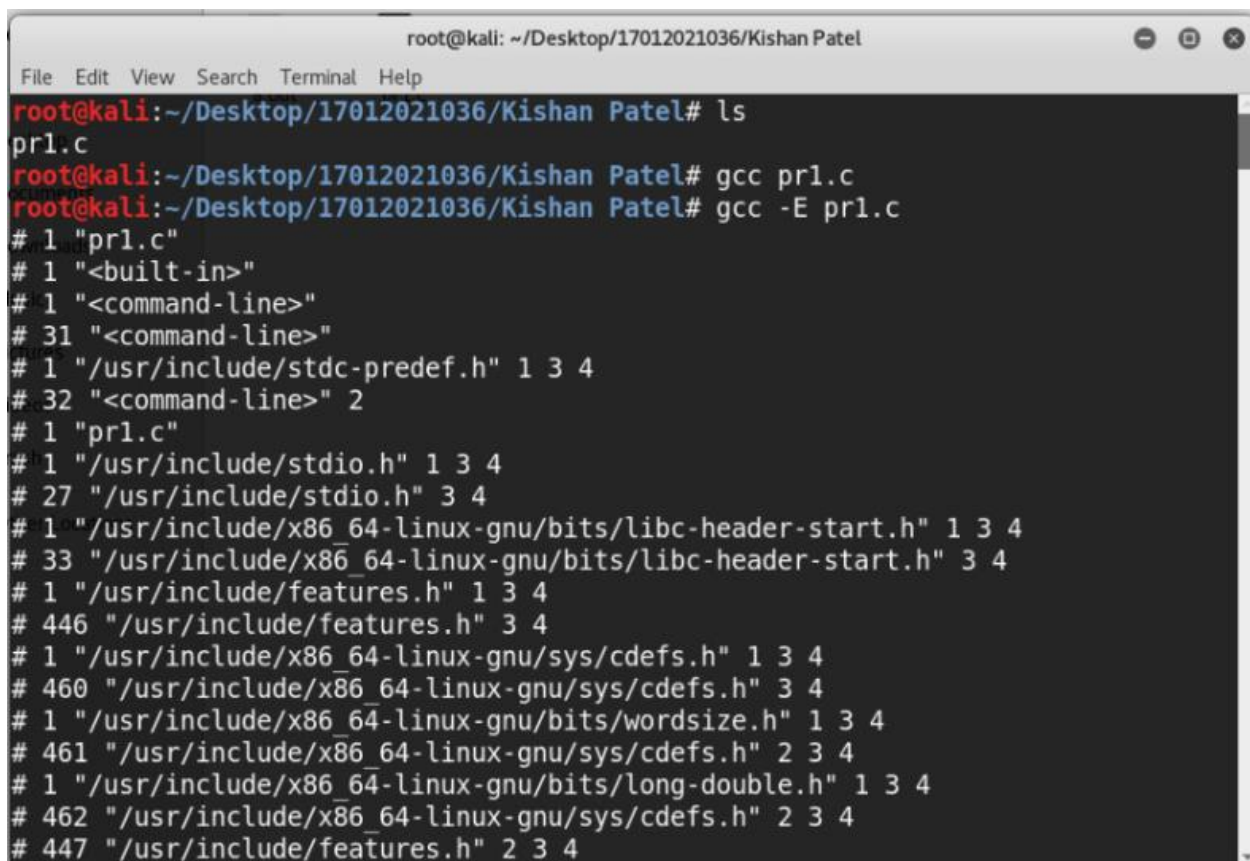
AIM : Study about each modules of compilation process with program.

File name : Pra1.c

```
#include<stdio.h>
Void main()
{
Int a=5;
Int b=1,c;
C=a+b;
Printf("%d",c);
}
```

1.Preprocessor:

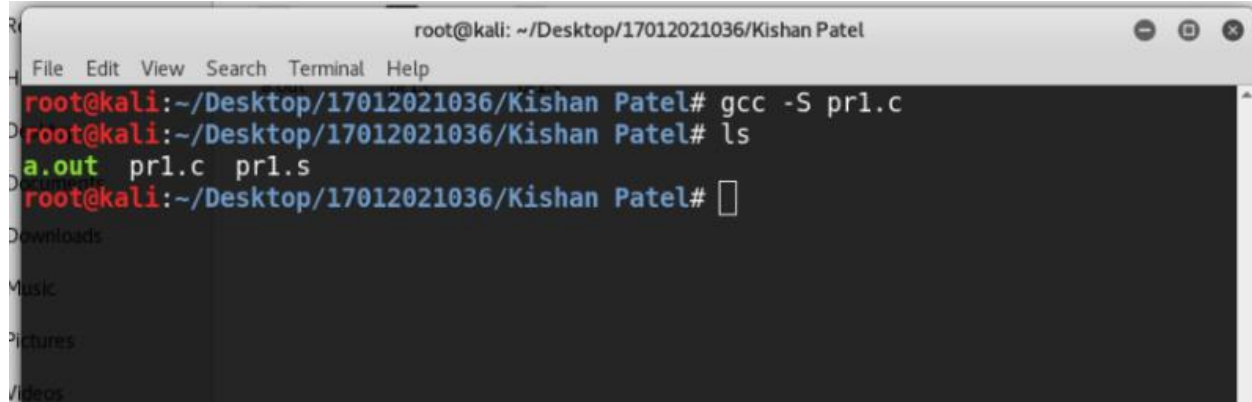
- gcc -E cfile.c
- In this step all #function are removes and instead of it a line of code of # function is included



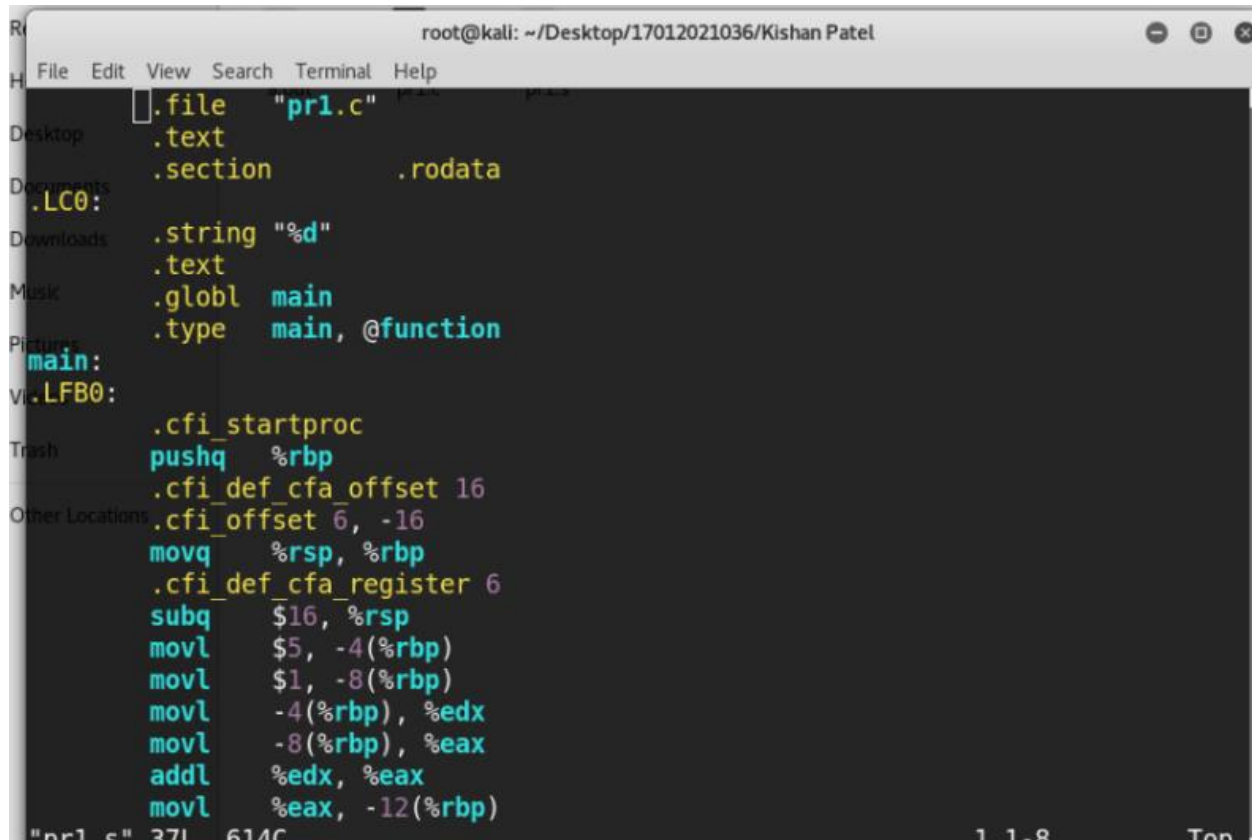
```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
root@kali:~/Desktop/17012021036/Kishan Patel# ls
pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# gcc pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -E pr1.c
# 1 "pr1.c"
# 1 "<built-in>"
# 1 "<command-line>"
# 31 "<command-line>"
# 1 "/usr/include/stdc-predef.h" 1 3 4
# 32 "<command-line>" 2
# 1 "pr1.c"
# 1 "/usr/include/stdio.h" 1 3 4
# 27 "/usr/include/stdio.h" 3 4
# 1 "/usr/include/x86_64-linux-gnu/bits/libc-header-start.h" 1 3 4
# 33 "/usr/include/x86_64-linux-gnu/bits/libc-header-start.h" 3 4
# 1 "/usr/include/features.h" 1 3 4
# 446 "/usr/include/features.h" 3 4
# 1 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 1 3 4
# 460 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 3 4
# 1 "/usr/include/x86_64-linux-gnu/bits/wordsize.h" 1 3 4
# 461 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 2 3 4
# 1 "/usr/include/x86_64-linux-gnu/bits/long-double.h" 1 3 4
# 462 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 2 3 4
# 447 "/usr/include/features.h" 2 3 4
```

2.Compiler

- gcc -S cfile.c
- Generate pr1.s file



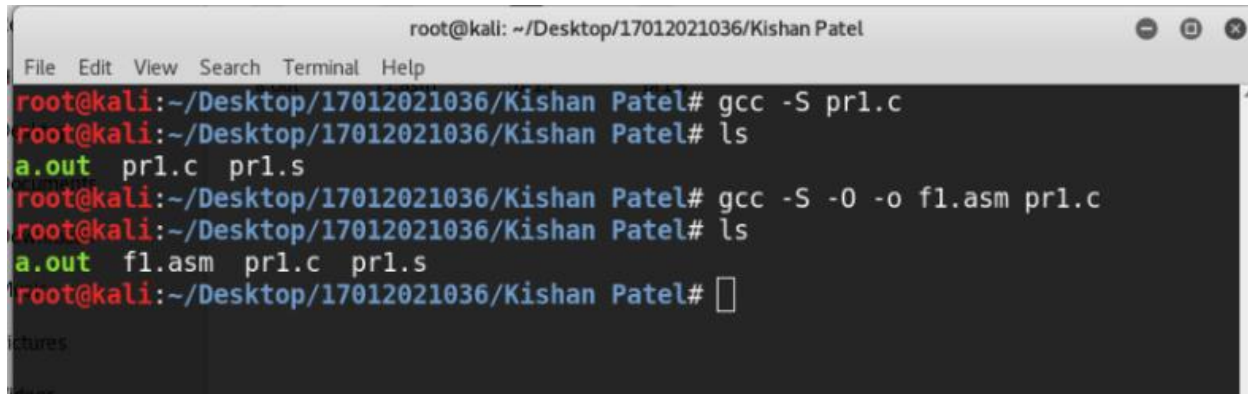
```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -S pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel#
```



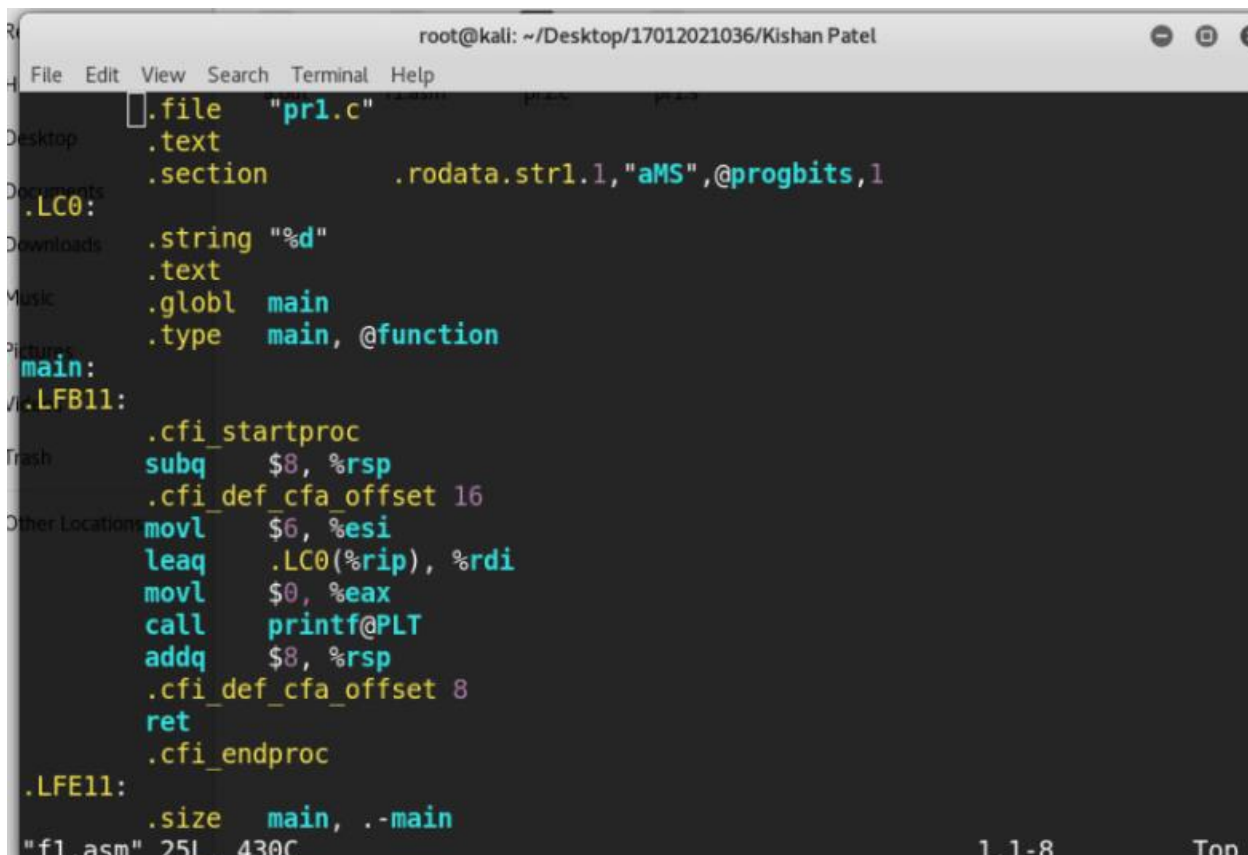
```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
.file "pr1.c"
.text
.section .rodata
.LC0:
.string "%d"
.text
.globl main
.type main, @function
main:
.LFB0:
.cfi_startproc
pushq %rbp
.cfi_def_cfa_offset 16
.cfi_offset 6, -16
movq %rsp, %rbp
.cfi_def_cfa_register 6
subq $16, %rsp
movl $5, -4(%rbp)
movl $1, -8(%rbp)
movl -4(%rbp), %edx
movl -8(%rbp), %eax
addl %edx, %eax
movl %eax, -12(%rbp)
"pr1.s" 371 614C 1 1-8 Top
```

3.Assembler

- Convert code in machine understandable language and generate object file
- Generate f1.asm file
- gcc -S -O -o f1.asm cfile.c



```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -S pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -S -O -o f1.asm pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out f1.asm pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel#
```

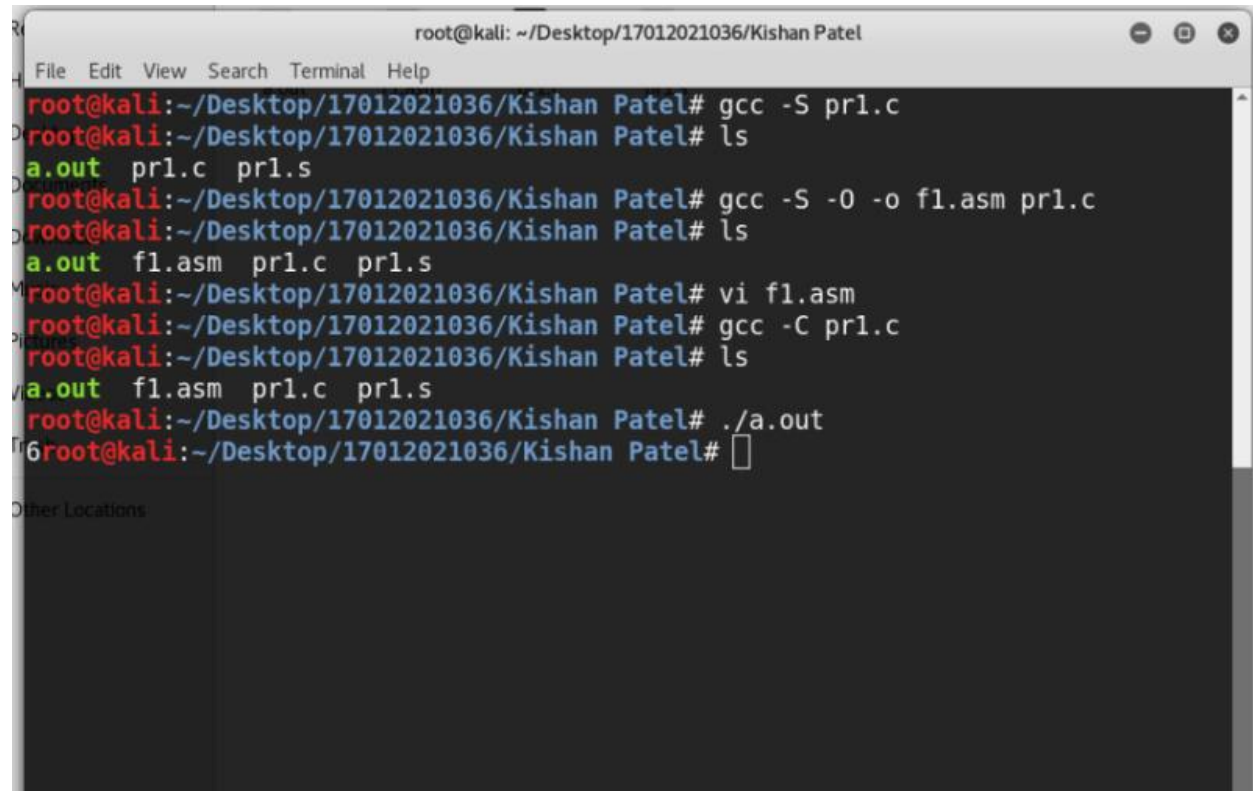


```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
.file "pr1.c"
.text
.section .rodata.str1.1,"aMS",@progbits,1
.LC0:
.string "%d"
.text
.globl main
.type main, @function
main:
.LFB11:
.cfi_startproc
subq $8, %rsp
.cfi_def_cfa_offset 16
movl $6, %esi
leaq .LC0(%rip), %rdi
movl $0, %eax
call printf@PLT
addq $8, %rsp
.cfi_def_cfa_offset 8
ret
.cfi_endproc
.LFE11:
.size main, .-main
"f1.asm" 25L 430C 1 1-8 Top
```

- gcc -C cfile.s

4.Linker/loader

- • Execute program using “a.out” command



```
root@kali: ~/Desktop/17012021036/Kishan Patel
File Edit View Search Terminal Help
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -S pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -S -O -o f1.asm pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out f1.asm pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel# vi f1.asm
root@kali:~/Desktop/17012021036/Kishan Patel# gcc -C pr1.c
root@kali:~/Desktop/17012021036/Kishan Patel# ls
a.out f1.asm pr1.c pr1.s
root@kali:~/Desktop/17012021036/Kishan Patel# ./a.out
root@kali:~/Desktop/17012021036/Kishan Patel#
```