

Name :-

Purval Madhukar Bhude

Roll No. S20230010193

Subject :- CA

Assignment no. 1

1)Writing program for Hello world program

```
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/Sem 2/Computer Arch/assignment 1$ cat CA4.c
#include <stdio.h>

int main(){
    printf("Hello World!!!");
}
```

2) Compile the code converting CA4.c to CA4.out

```
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$  
9  
cc -E CA4.c -o CA4.i  
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$ gcc -S CA4.i -o CA4.s  
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$ gcc -c CA4.s -o CA4.o  
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$ gcc CA4.o -o CA4.out  
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$ ls  
CA4.c CA4.i CA4.o CA4.out CA4.s
```

- Preprocessing (CA4.i)

```
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/sem 2/Computer Arch/assignment 1$ cat CA4.i  
# 0 "CA4.c"  
# 0 "<built-in>"  
# 0 "<command-line>"  
# 1 "/usr/include/stdc-predef.h" 1 3 4  
# 0 "<command-line>" 2  
# 1 "CA4.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  
# 392 "/usr/include/features.h" 3 4  
# 1 "/usr/include/features-time64.h" 1 3 4  
# 20 "/usr/include/features-time64.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/bits/wordsize.h" 1 3 4  
# 21 "/usr/include/features-time64.h" 2 3 4  
# 1 "/usr/include/x86_64-linux-gnu/bits/timesize.h" 1 3 4  
# 19 "/usr/include/x86_64-linux-gnu/bits/timesize.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/bits/wordsize.h" 1 3 4  
# 20 "/usr/include/x86_64-linux-gnu/bits/timesize.h" 2 3 4  
# 22 "/usr/include/features-time64.h" 2 3 4  
# 393 "/usr/include/features.h" 2 3 4  
# 486 "/usr/include/features.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 1 3 4  
# 559 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/bits/wordsize.h" 1 3 4  
# 560 "/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  
# 561 "/usr/include/x86_64-linux-gnu/sys/cdefs.h" 2 3 4  
# 487 "/usr/include/features.h" 2 3 4  
# 510 "/usr/include/features.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/gnu/stubs.h" 1 3 4  
# 10 "/usr/include/x86_64-linux-gnu/gnu/stubs.h" 3 4  
# 1 "/usr/include/x86_64-linux-gnu/gnu/stubs-64.h" 1 3 4  
# 11 "/usr/include/x86_64-linux-gnu/gnu/stubs.h" 2 3 4  
# 511 "/usr/include/features.h" 2 3 4  
# 34 "/usr/include/x86_64-linux-gnu/bits/libc-header-start.h" 2 3 4  
# 28 "/usr/include/stdio.h" 2 3 4
```

And many more code in this file

- Compilation (CA4.s)

```
crillioniare@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/Sem 2/Computer Arch/assignment 1$ cat CA4.s
.file "CA4.c"
.text
.section .rodata

.LC0:
.string "Hello World!!!"
.text
.globl main
.type main, @function

main:
.LFB0:
.cfi_startproc
endbr64
pushq %rbp
.cfi_def_cfa_offset 16
.cfi_offset 6, -16
movq %rsp, %rbp
.cfi_def_cfa_register 6
leaq .LC0(%rip), %rax
movq %rax, %rdi
movl $0, %eax
call printf@PLT
movl $0, %eax
popq %rbp
.cfi_def_cfa 7, 8
ret
.cfi_endproc

.LFE0:
.size main, .-main
.ident "GCC: (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0"
.section .note.GNU-stack,"",@progbits
.section .note.gnu.property,"a"
.align 8
.long 1f - 0f
.long 4f - 1f
.long 5

0:
.string "GNU"

1:
.align 8
.long 0xc0000002
.long 3f - 2f

2:
.long 0x3

3:
.align 8

4:
```

- Assembly (CA4.o)

```
root@kali:~/LAPTOP-VU5Z48H:/mnt/c/Users/ASIGNMENTS/sem 2/Computer Arch/assignment 1$ cat CA4.o
UUHHHHHHHHHello World!!!GCC: (Ubuntu 11.4.0-1ubuntu1-22.04) 11.4.0GNUzRx

ZHEC
##
CA4.cmainprintf
+++++++ .symtab.strtab.shstrtab.rela.text.data.bss.rodata.comment.note.gnu-stack.note.gnu.property.rela.eh_frame @#0
sccl90r,B*Rj*je@
++
```

- Linking (CA4.out)

[illegible]

3)Executing the file

```
trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/Sem 2/Computer Arch/assignment 1$ ./CA4.out
Hello World!!!trillionaire@LAPTOP-VUSF240R:/mnt/c/IIITS ASSIGNMENTS/Sem 2/Computer Arch/assignment 1$
```