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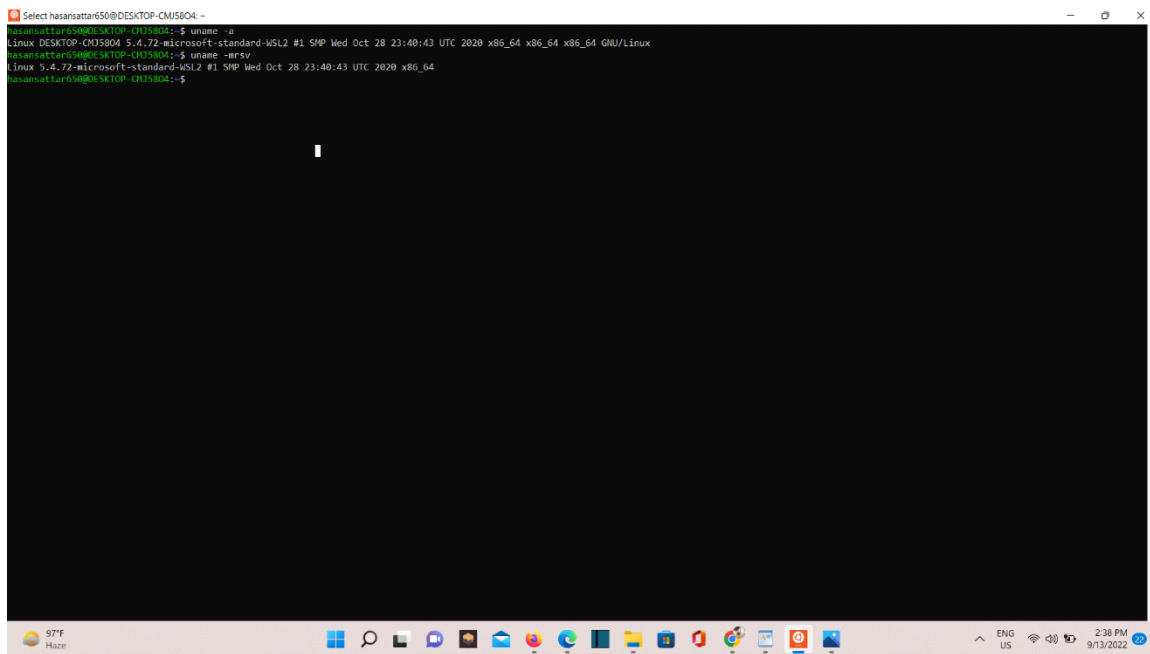
Submitted to: Dr. Bilal Khan

National University of Computer and Emerging Sciences

OPERATING SYSTEM

Q-1 (a)

Find out the Linux kernel version of your system using the command on the terminal. You are required to paste the screenshot in the answer?

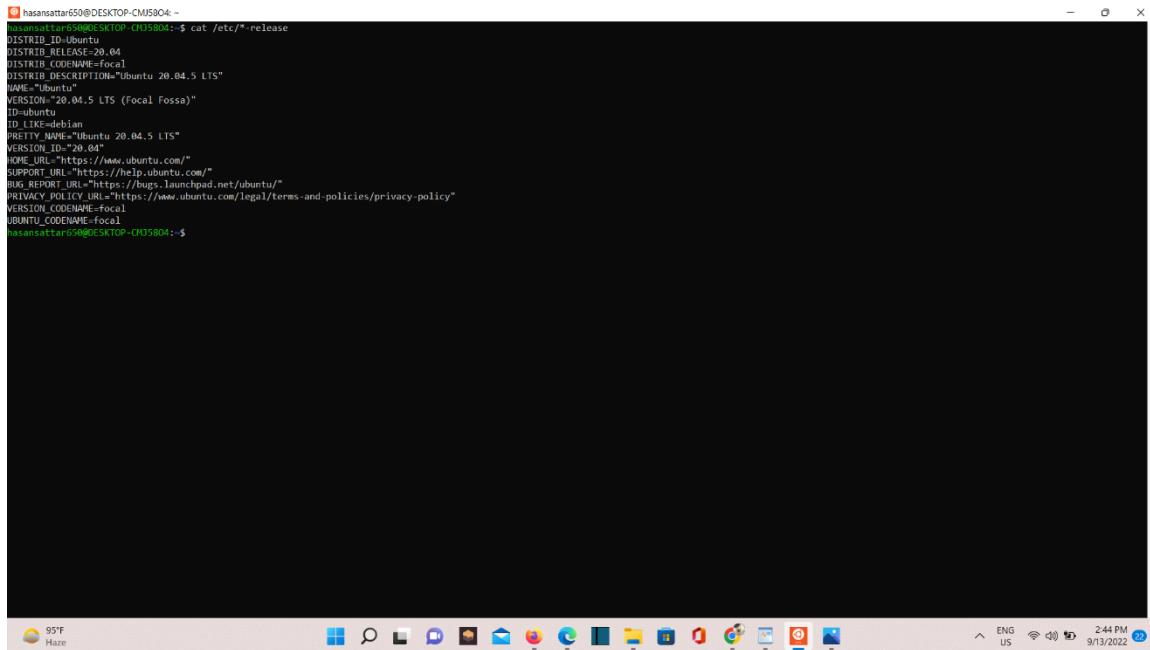


```
Select hasansatta650@DESKTOP-CM15804 -  
hasansattar650@DESKTOP-CM15804:~$ uname -r  
Linux DESKTOP-CM15804 5.4.72-microsoft-standard-WSL2 #1 SMP Wed Oct 28 23:40:43 UTC 2020 x86_64 x86_64 GNU/Linux  
hasansattar650@DESKTOP-CM15804:~$ uname -arsv  
Linux 5.4.72-microsoft-standard-WSL2 #1 SMP Wed Oct 28 23:40:43 UTC 2020 x86_64  
hasansattar650@DESKTOP-CM15804:~$
```

The screenshot shows a Windows 10 desktop environment with a terminal window open. The terminal window title is "Select hasansatta650@DESKTOP-CM15804 -". The terminal content shows the user hasansattar650@DESKTOP-CM15804:~\$ running the command 'uname -r', which returns 'Linux DESKTOP-CM15804 5.4.72-microsoft-standard-WSL2 #1 SMP Wed Oct 28 23:40:43 UTC 2020 x86_64 x86_64 GNU/Linux'. The user then runs 'uname -arsv', which returns 'Linux 5.4.72-microsoft-standard-WSL2 #1 SMP Wed Oct 28 23:40:43 UTC 2020 x86_64'. The terminal window is maximized, and the Windows taskbar is visible at the bottom with the date 9/13/2022 and time 2:38 PM.

Q-1 (b)

Find out the distribution name and version of your operating system using the command on the terminal. You are required to paste the screenshot in the answer ?

A screenshot of a Linux terminal window. The window title is 'hasanattar650@DESKTOP-CM5804 -'. The prompt is 'hasanattar650@DESKTOP-CM5804:~\$'. The command entered is 'cat /etc/*-release'. The output is as follows:

```
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=20.04
DISTRIB_CODENAME=focal
DISTRIB_DESCRIPTION="Ubuntu 20.04.5 LTS"
NAME="Ubuntu"
VERSION="20.04.5 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.5 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=focal
UBUNTU_CODENAME=focal
hasanattar650@DESKTOP-CM5804:~$
```

The terminal window is set against a black background with green text. The desktop environment is visible at the bottom, showing a taskbar with various application icons and a system tray with weather, language, and time information.

Q-2

For this question you are required to use standard c library to perform I/O operations.

(a)

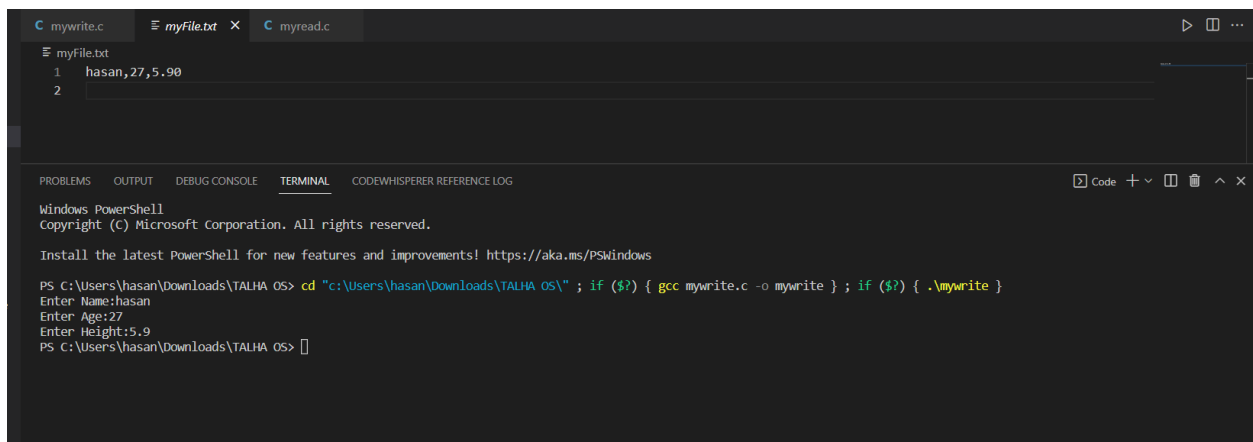
Write a C program (named: mywrite.c) which will open a new text file (myFile.txt) in the write mode. Using the c standard library API, your program should take the following information from the user in the terminal window: Name, Age (type integer), Height (in Feet, type float). Next, it should write the above information to the myFile.txt ?

```
#include <stdio.h>

void main()
{
    char Name[50];
    int Age;
    float Height;

    FILE* FileHandler = fopen( "myFile.txt", "w" );
    if (FileHandler == NULL)
    {
        printf("Not Found .\n");
        return;
    }
}
```

```
printf("Enter Name:");  
  
scanf("%s", &Name);  
  
printf("Enter Age:");  
  
scanf("%d", &Age);  
  
printf("Enter Height:");  
  
scanf("%f", &Height);  
  
fprintf(FileHandler,"%s,%d,%.2f\n", Name, Age, Height);  
  
fclose(FileHandler) ;  
  
}
```



The screenshot shows a Visual Studio Code editor with three tabs: `mywrite.c`, `myFile.txt`, and `myread.c`. The `myFile.txt` tab is active, displaying the following content:

```
1 hasan,27,5.90  
2
```

Below the editor, the `TERMINAL` panel is open, showing a Windows PowerShell session. The output of the program is as follows:

```
Windows PowerShell  
Copyright (c) Microsoft Corporation. All rights reserved.  
  
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows  
  
PS C:\Users\hasan\Downloads\TALHA OS> cd "C:\Users\hasan\Downloads\TALHA OS" ; if ($?) { gcc mywrite.c -o mywrite } ; if ($?) { .\mywrite }  
Enter Name:hasan  
Enter Age:27  
Enter Height:5.9  
PS C:\Users\hasan\Downloads\TALHA OS>
```

(b)

Write another C program (myread.c) which will open an already existing file (myFile.txt obtained from the above program) in read mode. Using the c standard library API, your program will read the information in the myFile.txt and print it to the terminal window ?

```
#include <stdio.h>

void main()
{
    FILE* FileHandler = fopen( "myFile.txt", "r" );
    if( FileHandler == NULL )
    {
        printf("Not Found.\n");
        return;
    }

    char ch;

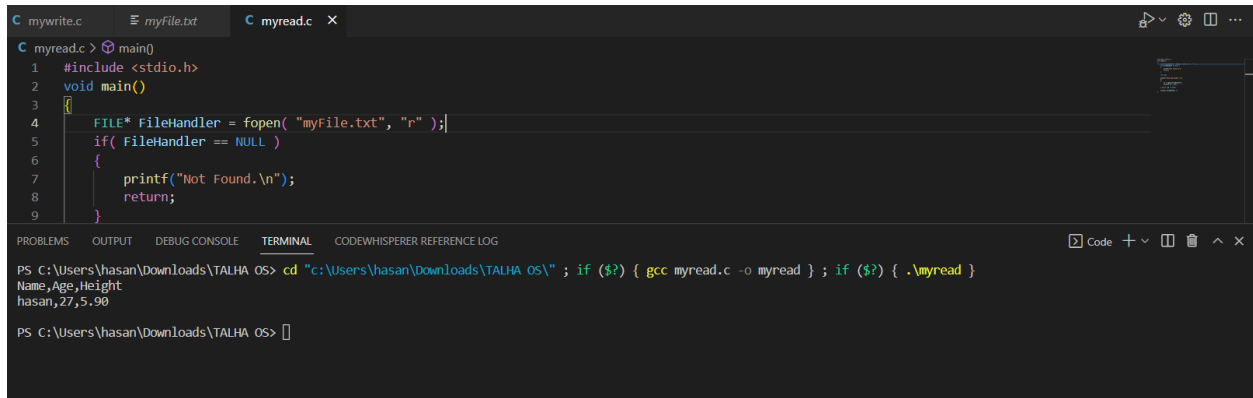
    printf("Name, Age, Height \n");
    do
    {
        ch = fgetc(FileHandler);
        printf("%c", ch);
```

```

    } while (ch != EOF);

    fclose( FileHandler );
}

```



The screenshot shows a Visual Studio Code editor with three tabs: `mywrite.c`, `myFile.txt`, and `myread.c`. The `myread.c` tab is active, displaying the following C code:

```

1  #include <stdio.h>
2  void main()
3  {
4      FILE* FileHandler = fopen( "myFile.txt", "r" );
5      if( FileHandler == NULL )
6      {
7          printf("Not Found.\n");
8          return;
9      }

```

Below the code editor is a terminal window. The terminal shows the command to compile and run the program:

```

PS C:\Users\hasan\Downloads\TALHA OS> cd "c:\Users\hasan\Downloads\TALHA OS\" ; if ($?) { gcc myread.c -o myread } ; if ($?) { .\myread }
Name,Age,Height
hasan,27,5.90
PS C:\Users\hasan\Downloads\TALHA OS>

```

Q-3

What does POSIX stand for? Write a short (up to 10 lines) description on POSIX?

POSIX stand for Portable Operating System Interface. It is a portable operating system based on the UNIX operating system. This standard specified by IEEE computer society. It describes both user-level and system level application programming interfaces along with a CMD (command line interface). **POSIX** is used to make application portability easier. POSIX is considering a subset of UNIX and is used to cover different Unix-like environments for many other operating systems. POSIX at the beginning hold different environments, such as Eunice for Virtual Machines, POSIX Personality, and NT from Windows OS. **POSIX** is portable between different

variants of UNIX. In general terms, we can call POSIX as an operating system of UNIX.

Q-4

Various Operating systems use various structures such as Monolithic, Layered or Microkernel. Give at least five examples of operating systems for each of the structure.?

Various Operating systems use various structures such as Monolithic, Layered or Microkernel.

Monolithic Kernel:

- 1) *Linux*
- 2) *Microsoft Windows (95, 98)*
- 3) *Solaris*
- 4) *HP-UX*
- 5) *DOS*

Layered or microkernel:

- 1) *Symbian*
- 2) *Mac OS X*
- 3) *PikeOS*
- 4) *Minix and Coyotos.*
- 5) *L4Linux*

