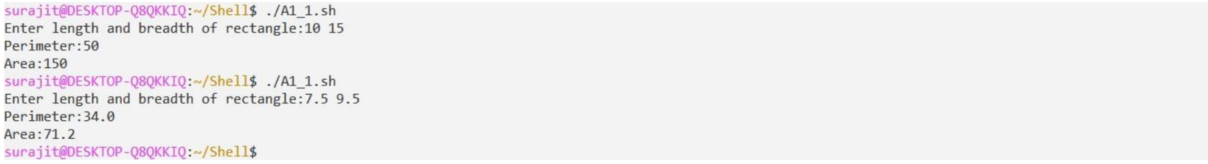
Assignment 1: Problem 1:

Write a shell script which accepts length and breadth of a rectangle and calculates the area and perimeter of the rectangle.

CODE:

```
echo -n "Enter length and breadth of rectangle:"
read l b echo -n "Perimeter:" echo "2*($l+$b)" |
bc echo -n "Area:"
echo "$l*$b" | bc
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_1.sh
Enter length and breadth of rectangle:10 15
Perimeter:50
Area:150
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_1.sh
Enter length and breadth of rectangle:7.5 9.5
Perimeter:34.0
Area:71.2
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

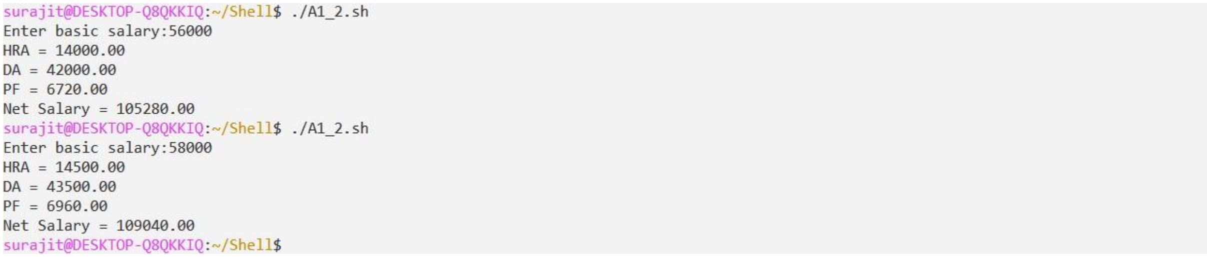
Problem 2:

Write a shell script which accepts basic salary of an employee, and calculates net salary and displays the salary slip.

CODE:

```
echo -n "Enter basic salary:"
read bs echo -n "HRA = "
echo "scale=2;$bs * 0.25" |bc
echo -n "DA = "
echo "scale=2;$bs * 0.75" |bc
echo -n "PF = " echo
"scale=2;$bs * 0.12" |bc echo
-n "Net Salary = "
echo "scale=2;$bs + $bs * 0.25 + $bs * 0.75 - $bs * 0.12" |bc
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_2.sh
Enter basic salary:56000
HRA = 14000.00
DA = 42000.00
PF = 6720.00
Net Salary = 105280.00
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_2.sh
Enter basic salary:58000
HRA = 14500.00
DA = 43500.00
PF = 6960.00
Net Salary = 109040.00
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

Problem 3:

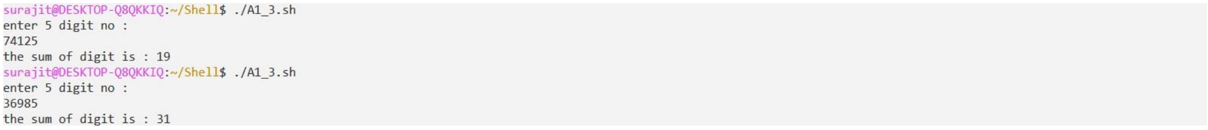
Write a shell script which accepts a five digit number and prints sum of its digits.

CODE:

```
echo " enter 5 digit no : "
read num
sum=0
while [ $num -gt 0 ]
```

```
do mod=$((num % 10)) #It will split each
digits sum=$((sum + mod)) #Add each digit
to sum num=$((num / 10)) #divide num by
10. done
echo " the sum of the digits is : $sum"
```

Output:



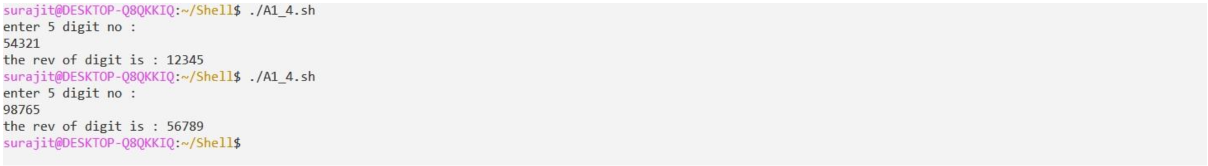
```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_3.sh
enter 5 digit no :
74125
the sum of digit is : 19
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_3.sh
enter 5 digit no :
36985
the sum of digit is : 31
```

Problem 4:

Write a shell script which accepts a five digit number and prints the reverse number. CODE:

```
echo " enter 5 digit no :"
read num
num1=$num sum=0
while [ $num -gt 0 ] do
sum=$(expr $sum \* 10)
k=$(expr $num % 10)
sum=$(expr $sum + $k)
num=$(expr $num / 10) done
echo "The rev of digit is $sum"
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_4.sh
enter 5 digit no :
54321
the rev of digit is : 12345
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_4.sh
enter 5 digit no :
98765
the rev of digit is : 56789
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

Problem 5:

The /etc/passwd file stores user account information. It contains one entry per line for each user (user account) of the system.

Each line contains seven fields which are separated by a colon (:) symbol. The fields are: (i) Username (ii) Password

(iii) User Id

(iv) Group Id

(v) User Id Info

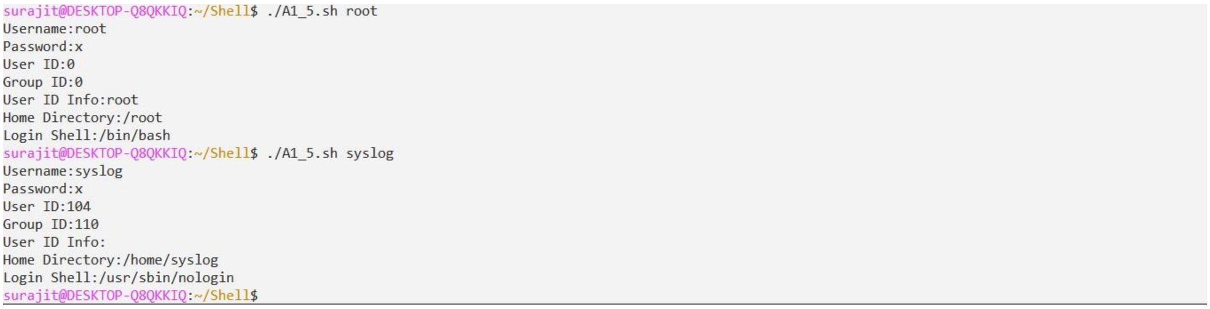
(vi) Home Directory

(vii) Login Shell

Write a shell script which accepts a user login name and displays detail information about the users as available from the file /etc/passwd. CODE:

```
field1=`cat /etc/passwd | grep $1 | cut -d: -f1`
echo -n "Username:" echo
$field1
field2=`cat /etc/passwd | grep $1 | cut -d: -f2`
```

```
echo -n "Password:" echo
$field2
field3=`cat /etc/passwd | grep $1 | cut -d: -f3`
echo -n "User ID:" echo $field3
field4=`cat /etc/passwd | grep $1 | cut -d: -f4`
echo -n "Group ID:" echo $field4
field5=`cat /etc/passwd | grep $1 | cut -d: -f5`
echo -n "User ID Info:" echo $field5
field6=`cat /etc/passwd | grep $1 | cut -d: -f6`
echo -n "Home Directory:" echo
$field6
field7=`cat /etc/passwd | grep $1 | cut -d: -f7`
echo -n "Login Shell:" echo $field7 Output:
```



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_5.sh root
Username:root
Password:x
User ID:0
Group ID:0
User ID Info:root
Home Directory:/root
Login Shell:/bin/bash
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A1_5.sh syslog
Username:syslog
Password:x
User ID:104
Group ID:110
User ID Info:
Home Directory:/home/syslog
Login Shell:/usr/sbin/nologin
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

Assignment 2:

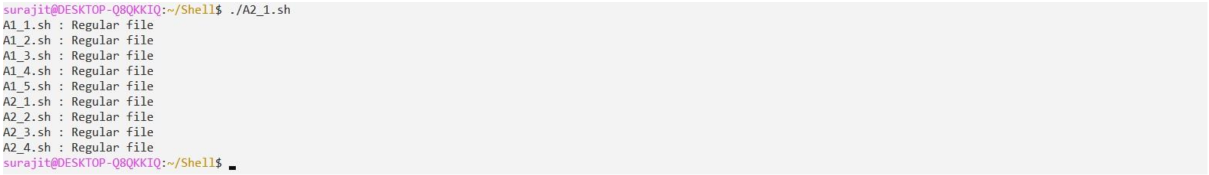
Problem 1:

Write a shell script which, for all files in present directory displays whether it is a regular file or a directory.

CODE:

```
for file in * do
#CONDITION FOR REGULAR FILE CHECKING if
[ -f $file ]
then
echo "$file : Regular file"
#CONDITION FOR DIRECTORY CHECKING
elif [ -d $file ] then
echo "$file : Directory" fi
done
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A2_1.sh
A1_1.sh : Regular file
A1_2.sh : Regular file
A1_3.sh : Regular file
A1_4.sh : Regular file
A1_5.sh : Regular file
A2_1.sh : Regular file
A2_2.sh : Regular file
A2_3.sh : Regular file
A2_4.sh : Regular file
surajit@DESKTOP-Q8QKKIQ:~/Shell$ 
```

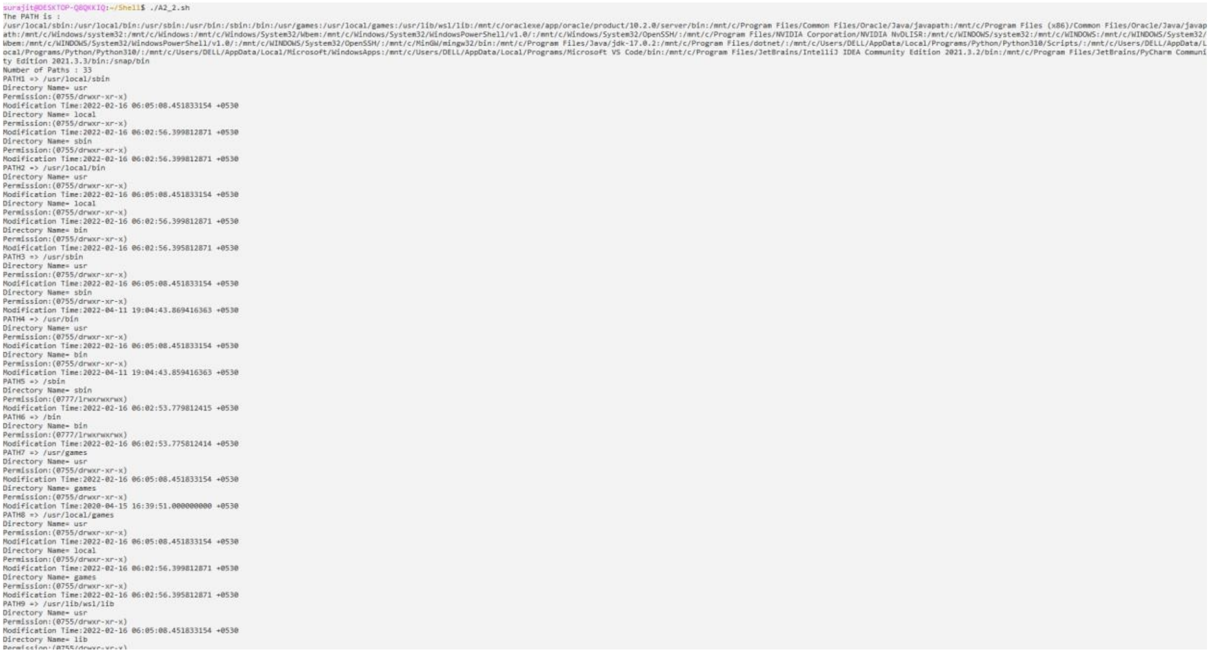
Problem 2:

The PATH variable is an environment variable that contains an ordered list of paths that Linux will search for executables when running a command. Write a shell script to display all the directories in the PATH variable in a simple way, i.e., one line per directory. In addition, display information about each directory, such as the permissions and the modification times.

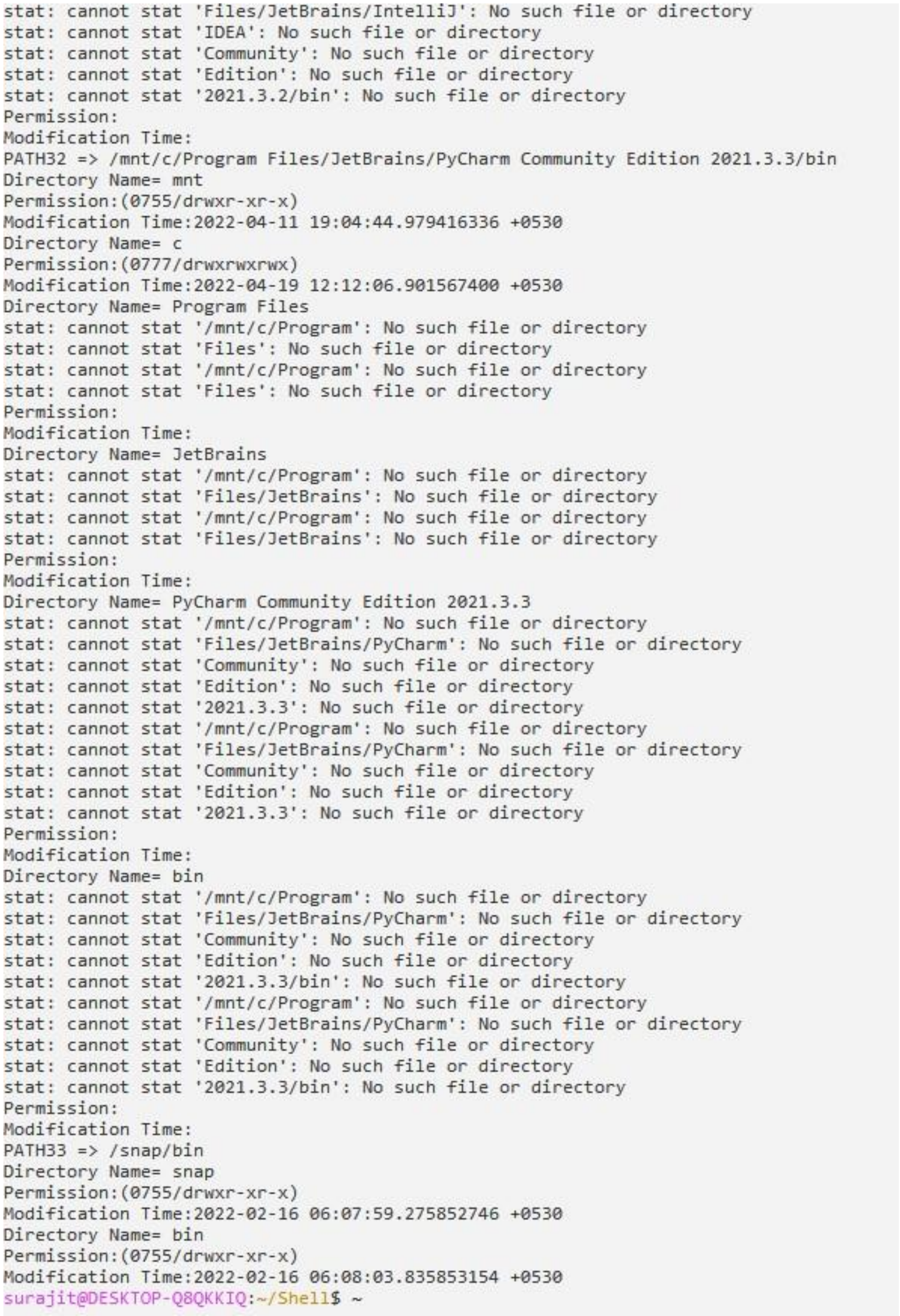
CODE:

```
echo "The PATH is : " echo
"$PATH"
#command to count number of lines in PATH #tr
command replaces ":" by "\n" no_line=`echo
"$PATH" | tr ":" "\n" | wc -l` echo "Number of
Paths : $no_line"
#access each path
i=1 #cd
/
while [ $i -le $no_line ]
do
curr_path=`echo "$PATH" | cut -d":" -f$i` echo
"PATH$i => $curr_path"
#command to coundno of lines after replaceing "\| by "\n"
val=`echo "$curr_path" | tr "/" "\n" | wc -l`
j=2 str=""
#loop to acces subdirectories while
[ $j -le $val ]
do
dir=`echo "$curr_path" | cut -d "/" -f $j` echo
"Directory Name= $dir"
#string appending to access the required path str+="/"
str+=$dir permission=`stat $str | grep "Access" | head -n 1 |
cut -d" " -f2` modification_time=`stat $str | grep "Modify" | cut
-d" " -f2-4`
echo        "Permission:$permission"        echo
"Modification   Time:$modification_time"   let
j=j+1 done
let i=i+1 done
```

Output :



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A2_2.sh
The PATH is :
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/lib/wsl/lib:/mnt/c/oraclexe/app/oracle/product/10.2.0/server/bin:/mnt/c/Program Files/Common Files/Oracle/Java/javapath:/mnt/c/Program Files (x86)/Common Files/Oracle/Java/javap
ath:/mnt/c/Windows/system32:/mnt/c/Windows:/mnt/c/Windows/System32/Wbem:/mnt/c/Windows/System32/WindowsPowerShell/v1.0/:/mnt/c/Windows/System32/OpenSSH/:/mnt/c/Program Files/NVIDIA Corporation/NVIDIA NvDLISR:/mnt/c/WINDOWS/system32:/mnt/c/WINDOWS:/mnt/c/WINDOWS/System32/
Wbem:/mnt/c/WINDOWS/System32/WindowsPowerShell/v1.0/:/mnt/c/WINDOWS/System32/OpenSSH/:/mnt/c/MinGW/mingw32/bin:/mnt/c/Program Files/Java/jdk-17.0.2:/mnt/c/Program Files/dotnet/:/mnt/c/Users/DELL/AppData/Local/Programs/Python/Python310/Scripts/:/mnt/c/Users/DELL/AppData/L
ocal/Programs/Python/Python310/:/mnt/c/Users/DELL/AppData/Local/Microsoft/WindowsApps:/mnt/c/Users/DELL/AppData/Local/Programs/Microsoft VS Code/bin:/mnt/c/Program Files/JetBrains/IntelliJ IDEA Community Edition 2021.3.2/bin:/mnt/c/Program Files/JetBrains/PyCharm Communi
ty Edition 2021.3.3/bin:/snap/bin
Number of Paths : 33
PATH1 => /usr/local/sbin
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= local
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.399812871 +0530
Directory Name= sbin
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.399812871 +0530
PATH2 => /usr/local/bin
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= local
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.399812871 +0530
Directory Name= bin
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.395812871 +0530
PATH3 => /usr/sbin
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= sbin
Permission:(0755/drwxr-xr-x)
Modification Time:2022-04-11 19:04:43.869416363 +0530
PATH4 => /usr/bin
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= bin
Permission:(0755/drwxr-xr-x)
Modification Time:2022-04-11 19:04:43.859416363 +0530
PATH5 => /sbin
Directory Name= sbin
Permission:(0777/lrwxrwxrwx)
Modification Time:2022-02-16 06:02:53.779812415 +0530
PATH6 => /bin
Directory Name= bin
Permission:(0777/lrwxrwxrwx)
Modification Time:2022-02-16 06:02:53.775812414 +0530
PATH7 => /usr/games
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= games
Permission:(0755/drwxr-xr-x)
Modification Time:2020-04-15 16:39:51.000000000 +0530
PATH8 => /usr/local/games
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= local
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.399812871 +0530
Directory Name= games
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:02:56.395812871 +0530
PATH9 => /usr/lib/wsl/lib
Directory Name= usr
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:05:08.451833154 +0530
Directory Name= lib
Permission:(0755/drwxr-xr-x)
```



```
stat: cannot stat 'Files/JetBrains/IntelliJ': No such file or directory
stat: cannot stat 'IDEA': No such file or directory
stat: cannot stat 'Community': No such file or directory
stat: cannot stat 'Edition': No such file or directory
stat: cannot stat '2021.3.2/bin': No such file or directory
Permission:
Modification Time:
PATH32 => /mnt/c/Program Files/JetBrains/PyCharm Community Edition 2021.3.3/bin
Directory Name= mnt
Permission:(0755/drwxr-xr-x)
Modification Time:2022-04-11 19:04:44.979416336 +0530
Directory Name= c
Permission:(0777/drwxrwxrwx)
Modification Time:2022-04-19 12:12:06.901567400 +0530
Directory Name= Program Files
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files': No such file or directory
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files': No such file or directory
Permission:
Modification Time:
Directory Name= JetBrains
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains': No such file or directory
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains': No such file or directory
Permission:
Modification Time:
Directory Name= PyCharm Community Edition 2021.3.3
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains/PyCharm': No such file or directory
stat: cannot stat 'Community': No such file or directory
stat: cannot stat 'Edition': No such file or directory
stat: cannot stat '2021.3.3': No such file or directory
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains/PyCharm': No such file or directory
stat: cannot stat 'Community': No such file or directory
stat: cannot stat 'Edition': No such file or directory
stat: cannot stat '2021.3.3': No such file or directory
Permission:
Modification Time:
Directory Name= bin
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains/PyCharm': No such file or directory
stat: cannot stat 'Community': No such file or directory
stat: cannot stat 'Edition': No such file or directory
stat: cannot stat '2021.3.3/bin': No such file or directory
stat: cannot stat '/mnt/c/Program': No such file or directory
stat: cannot stat 'Files/JetBrains/PyCharm': No such file or directory
stat: cannot stat 'Community': No such file or directory
stat: cannot stat 'Edition': No such file or directory
stat: cannot stat '2021.3.3/bin': No such file or directory
Permission:
Modification Time:
PATH33 => /snap/bin
Directory Name= snap
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:07:59.275852746 +0530
Directory Name= bin
Permission:(0755/drwxr-xr-x)
Modification Time:2022-02-16 06:08:03.835853154 +0530
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ~
```

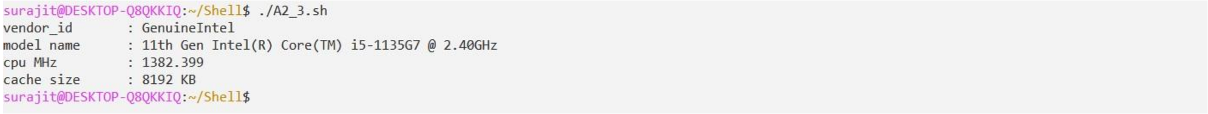
Problem 3:

Write a shell script which displays vendor id, model name, cpu MHz, cache size information about the processor present in your computer.

CODE:

```
#to show vendor id
cat /proc/cpuinfo|grep -m1 'vendor_id'
#to show model name
cat /proc/cpuinfo|grep -m1 'model name'
#to show cpu MHz
cat /proc/cpuinfo|grep -m1 'cpu MHz'
#to show cache size
cat /proc/cpuinfo|grep -m1 'cache size'
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A2_3.sh
vendor_id       : GenuineIntel
model name      : 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz
cpu MHz         : 1382.399
cache size      : 8192 KB
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

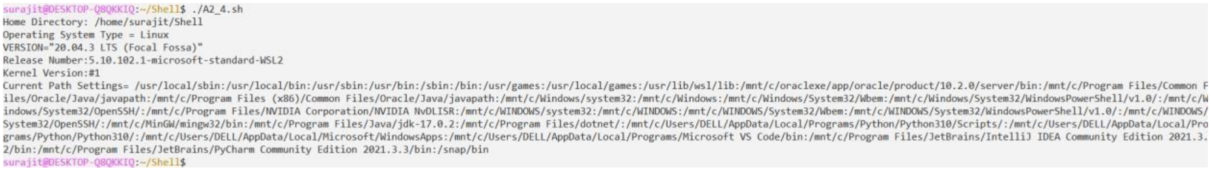
Problem 4:

#Write a shell script to show your home directory, Operating System type, version, release number, kernel version and current path setting.

CODE:

```
#to show home directory echo -n
"Home Directory: `pwd` " echo
#to  show  operating  system  name  echo  -n
"Operating System Type = $(uname)" echo
#to show version
cat /etc/os-release|grep -m1 'VERSION'
#to show release number echo
-n "Release Number:" uname -
r
#to show kernel version echo
-n "Kernel Version:"
var1=`uname -v`
#cut 1st field of command to show only kernel version
echo $var1 | cut -d" " -f1 #to show current path setting
echo "Current Path Settings= $PATH"
```

Output:



```
surajit@DESKTOP-Q8QKKIQ:~/Shell$ ./A2_4.sh
Home Directory: /home/surajit/Shell
Operating System Type = Linux
VERSION="20.04.3 LTS (Focal Fossa)"
Release Number:5.10.102.1-microsoft-standard-WSL2
Kernel Version:#1
Current Path Settings= /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/lib/wsl/lib:/mnt/c/oraclexe/app/oracle/product/10.2.0/server/bin:/mnt/c/Program Files/Common F
iles/Oracle/Java/javapath:/mnt/c/Program Files (x86)/Common Files/Oracle/Java/javapath:/mnt/c/Windows/system32:/mnt/c/Windows:/mnt/c/Windows/System32/Wbem:/mnt/c/Windows/System32/WindowsPowerShell/v1.0/:/mnt/c/W
indows/System32/OpenSSH/:/mnt/c/Program Files/NVIDIA Corporation/NVIDIA NvDLISR:/mnt/c/WINDOWS/system32:/mnt/c/WINDOWS:/mnt/c/WINDOWS/System32/Wbem:/mnt/c/WINDOWS/System32/WindowsPowerShell/v1.0/:/mnt/c/WINDOWS/
System32/OpenSSH/:/mnt/c/MinGW/mingw32/bin:/mnt/c/Program Files/Java/jdk-17.0.2:/mnt/c/Program Files/dotnet/:/mnt/c/Users/DELL/AppData/Local/Programs/Python/Python310/Scripts/:/mnt/c/Users/DELL/AppData/Local/Pro
grams/Python/Python310/:/mnt/c/Users/DELL/AppData/Local/Microsoft/WindowsApps:/mnt/c/Users/DELL/AppData/Local/Programs/Microsoft VS Code/bin:/mnt/c/Program Files/JetBrains/IntelliJ IDEA Community Edition 2021.3.
2/bin:/mnt/c/Program Files/JetBrains/PyCharm Community Edition 2021.3.3/bin:/snap/bin
surajit@DESKTOP-Q8QKKIQ:~/Shell$
```

Problem 5:

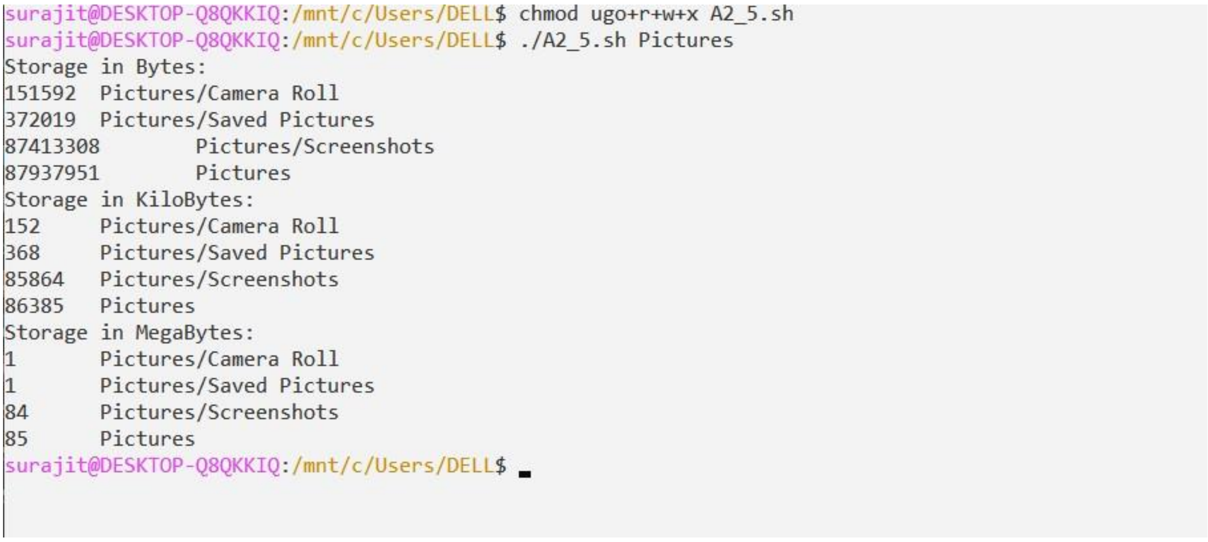
Write a shell script to display a summary of the disk space usage for each directory argument (and any subdirectories), both in terms of bytes, and kilobytes or megabytes (whichever is appropriate).

CODE:

```
if [ $# -lt 1 ]
then
echo "Too Few Arguments..."
exit
```

```
fi
echo "Storage in Bytes:"
for i in $*
do du -b
$i done
echo "Storage in KiloBytes:"
for i in $*
do du -k
$i done
echo "Storage in MegaBytes:"
for i in $* do du -m $i done
```

Output :



```
surajit@DESKTOP-Q8QKKIQ:/mnt/c/Users/DELL$ chmod ugo+r+w+x A2_5.sh
surajit@DESKTOP-Q8QKKIQ:/mnt/c/Users/DELL$ ./A2_5.sh Pictures
Storage in Bytes:
151592  Pictures/Camera Roll
372019  Pictures/Saved Pictures
87413308        Pictures/Screenshots
87937951        Pictures
Storage in KiloBytes:
152     Pictures/Camera Roll
368     Pictures/Saved Pictures
85864   Pictures/Screenshots
86385   Pictures
Storage in MegaBytes:
1       Pictures/Camera Roll
1       Pictures/Saved Pictures
84      Pictures/Screenshots
85      Pictures
surajit@DESKTOP-Q8QKKIQ:/mnt/c/Users/DELL$ 
```