N 38 B

# PRACTICAL FILE

## COMPUTER SCIENCE


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# #Program 1:

```
'''
Program defining functions for addition, subtraction and verifying whether the user input is
odd or even with no parameters.
'''

def add():
    x=int(input("Enter x:"))
    y=int(input("Enter y:"))
    z=x+y
    print(x,"+",y,"=",z)

def sub():
    x=int(input("Enter x:"))
    y=int(input("Enter y:"))
    z=x-y
    print(x,"-",y,"=",z)

def evenodd():
    x=int(input("Enter x:"))
    if x%2==0:
        print(x,"is an even number.")
    else:
        print(x,"is an odd number.")

c="y"
while c=="y" or c=="yes" :
    print("enter 1 for addition")
    print("enter 2 for subtraction")
    print("enter 3 for evenodd")
    f=int(input("Enter your function choice: "))
    print ("Your choice is: ",f)
    if f==1:
        add()
    elif f==2:
        sub()
    elif f==3:
        evenodd()
    else:
        print("invalid input")
    c=input("Would you like to continue? ")
```

# Output 1:

```
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 1
Your choice is:  1
Enter x:4
Enter y:5
4 + 5 = 9
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 2
Your choice is:  2
Enter x:7
Enter y:5
7 - 5 = 2
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 3
Your choice is:  3
Enter x:9
9 is an odd number.
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 3
Your choice is:  3
Enter x:14
14 is an even number.
Would you like to continue? n
```

# #Program 2:

```
'''
Program defining functions for addition, subtraction and verifying whether the user input is
odd or even with parameters (and arguments).
'''

def add(x:int,y:int):
    z=x+y
    print(x,"+",y,"=",z)

def sub(x:int,y:int):
    z=x-y
    print(x,"-",y,"=",z)

def evenodd(x:int):
    if x%2==0:
        print(x,"is an even number.")
    else:
        print(x,"is an odd number.")

c="y"
while c=="y" or c=="yes" :
    print("enter 1 for addition")
    print("enter 2 for subtraction")
    print("enter 3 for evenodd")
    f=int(input("Enter your function choice: "))
    print ("Your choice is: ",f)
    n1=int(input("Enter n1:"))
    n2=int(input("Enter n2:"))
    if f==1:
        add(n1,n2)
    elif f==2:
        sub(n1,n2)
    elif f==3:
        evenodd(n1)
        evenodd(n2)
    else:
        print("invalid input")
    c=input("Would you like to continue? ")
```

# Output 1:

```
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 1
Your choice is:  1
Enter n1:5
Enter n2:10
5 + 10 = 15
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 2
Your choice is:  2
Enter n1:15
Enter n2:10
15 - 10 = 5
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 3
Your choice is:  3
Enter n1:15
Enter n2:20
15 is an odd number.
20 is an even number.
Would you like to continue? n
```

# #Program 3:

```
'''
Program defining functions for addition, subtraction and verifying whether the user input is
odd or even with parameters (and arguments) and return.
'''

def add(x:int,y:int):
    z=x+y
    return z

def sub(x:int,y:int):
    z=x-y
    return z

def evenodd(x:int):
    if x%2==0:
        return 1
    else:
        return 3

c="y"
while c=="y" or c=="yes" :
    print("enter 1 for addition")
    print("enter 2 for subtraction")
    print("enter 3 for evenodd")
    f=int(input("Enter your function choice: "))
    print ("Your choice is: ",f)
    n1=int(input("Enter n1:"))
    n2=int(input("Enter n2:"))
    if f==1:
        a=add(n1,n2)
        print(n1,"+",n2,"=",a)
    elif f==2:
        a=sub(n1,n2)
        print(n1,"-",n2,"=",a)
    elif f==3:
        a=evenodd(n1)
        b=evenodd(n2)
        if a==1:
            print(n1,"is an even number.")
        else:
            print(n1,"is an odd number.")
        if b==1:
            print(n2,"is an even number.")
        else:
            print(n2,"is an odd number.")
    else:
        print("invalid input")
    c=input("Would you like to continue? ")
```

# Output 3:

```
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 1
Your choice is:  1
Enter n1:5
Enter n2:7
5 + 7 = 12
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 2
Your choice is:  2
Enter n1:8
Enter n2:10
8 - 10 = -2
Would you like to continue? y
enter 1 for addition
enter 2 for subtraction
enter 3 for evenodd
Enter your function choice: 3
Your choice is:  3
Enter n1:10
Enter n2:15
10 is an even number.
15 is an odd number.
Would you like to continue? n
```

# #Program 4:

```
'''
Program to define a function to generate a Fibonacci series of
the user input length.
'''

def fib():
    x=0
    y=1
    a=int(input("Enter the length of the series: "))
    print(x)
    print(y)
    for n in range(3,a+1):
        z=x+y
        print(z)
        x=y
        y=z
fib()
```

# Output 4:

```
Enter the length of the series: 10
0
1
1
2
3
5
8
13
21
34
```

# #Program 5:

```
'''
Program to verify whether a 3 digit number is an Armstrong number or not.
'''

def armno(x:int,y:int,z:int):
    x3=x**3
    y3=y**3
    z3=z**3
    s=x3+y3+z3
    if s==int(n) :
        print("Yes,",int(n),"is an Armstrong number.")
    else:
        print("No,",int(n),"is not an Armstrong number.")

n=str(input("Enter the 3 digit number to be verified: "))

a=int(n[0])
b=int(n[1])
c=int(n[2])

armno (a,b,c)
```

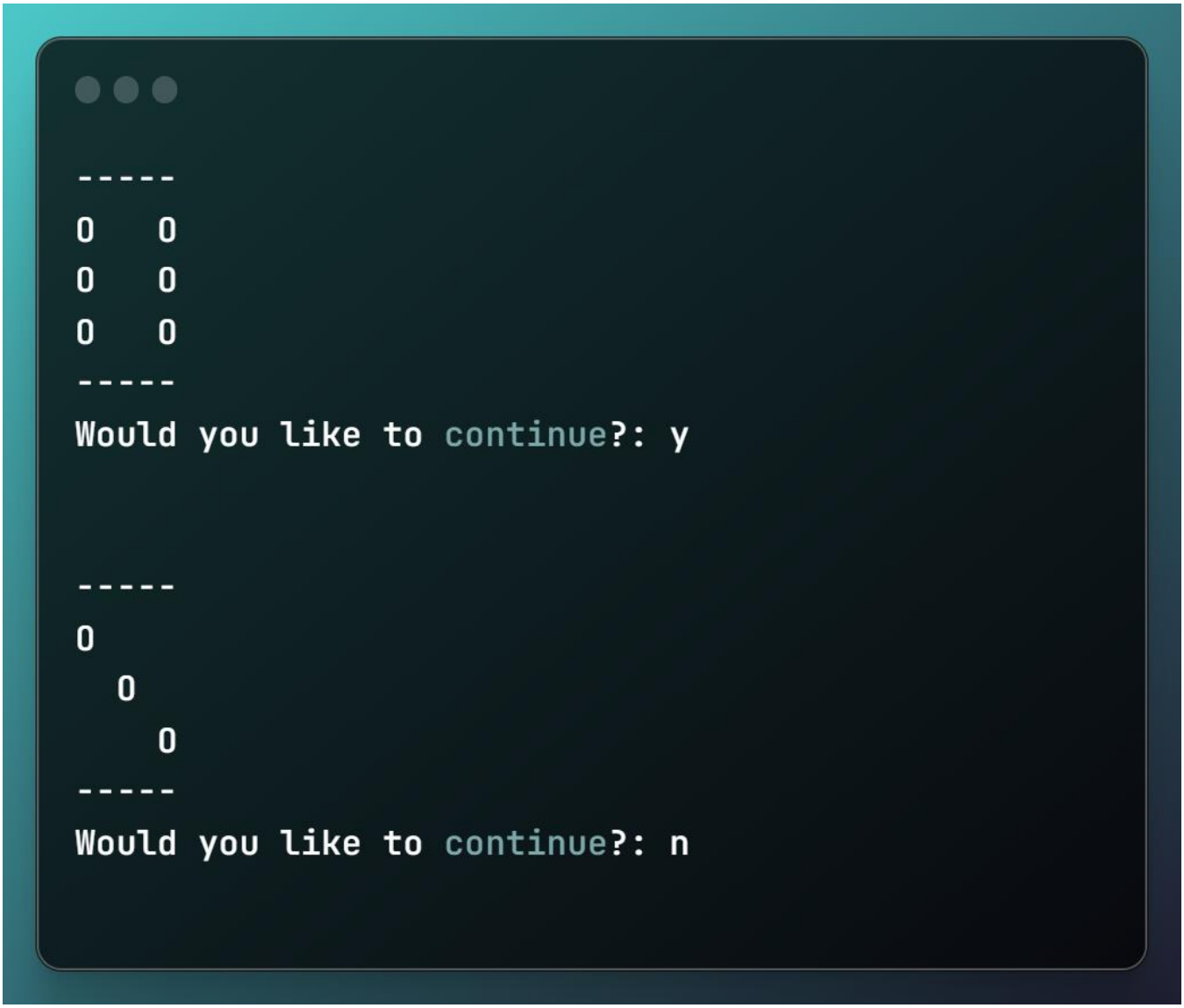
# Output 5:

```
Enter the 3 digit number to be verified: 153
Yes, 153 is an Armstrong number.
-----------------------------------------
Enter the 3 digit number to be verified: 234
No, 234 is not an Armstrong number.
```

# #Program 6:

```
'''
Program to generate a random number between 1 to 6 (including 1 and 6) using the random module
(dice simulator).
'''

import random

x = "y"

while x=="y" or x=="yes" :
    n = random.randint(1,6)

    if n==1:
        print("-----")
        print("     ")
        print("  O  ")
        print("     ")
        print("-----")

    elif n==2:
        print("-----")
        print("O    ")
        print("     ")
        print("    O")
        print("-----")

    elif n==3:
        print("-----")
        print("O    ")
        print("  O  ")
        print("    O")
        print("-----")

    elif n==4:
        print("-----")
        print("O   O")
        print("     ")
        print("O   O")
        print("-----")

    elif n==5:
        print("-----")
        print("O   O")
        print("  O  ")
        print("O   O")
        print("-----")

    elif n==6:
        print("-----")
        print("O   O")
        print("O   O")
        print("O   O")
        print("-----")

    x = input("Would you like to continue?: ")
    print("\n")
```

# Output 6:


-----
O O
O O
O O
-----
Would you like to continue?: y
-----
O
O
O
-----
Would you like to continue?: n

# #Program 7:

```
'''
Program to count the no. of "Me" or "My" words present in a
file story.txt. If the story.txt contents are as follows:
My first book
was Me and
My Family. It
gave Me
a chance to be
Known to the
world.
--------------
The output should read :
Total no. of Me and My=  4
'''

def countMeMy():
    num=0
    f=open("story.txt","r")
    n=f.read()
    m=n.split()
    for x in m:
        if x == "Me" or x == "My" :
            num=num+1
    f.close()
    print("Total no. of Me and My= ", num)

countMeMy()
```

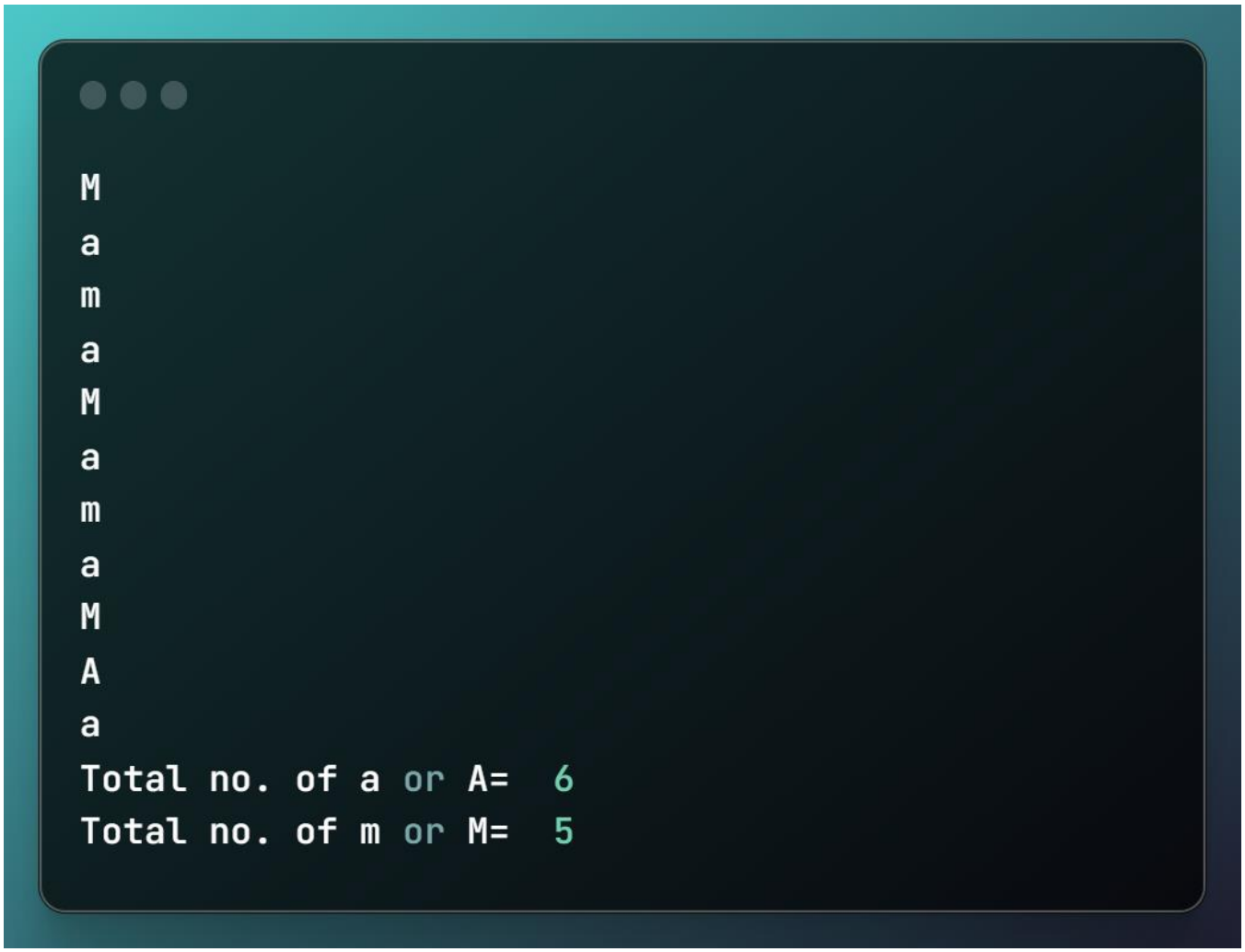
# Output 7:

```
Total no. of Me and My=  5
```

# #Program 8:

```
'''
Program which reads each character in a text file story.txt and displays and counts the
occurence of each A or a and M or m. If the story.txt contents are as follows:
My first book
Was me and
My family. It
Gave Me
A chance to be
Known to the
World.
'''

def amcount():
    l=0
    m=0
    f=open("story.txt",'r')
    n=f.read()
    for x in n:
        if x=="a" or x=="A" :
            print(x)
            l = l+1
        elif x=="m" or x=="M" :
            print(x)
            m = m+1
    f.close()
    print("Total no. of a or A= ",l)
    print("Total no. of m or M= ",m)

amcount()
```

# Output 8:



# #Program 9:

```
'''
Program to implement a stack.
'''
def stacks():
    l=[]
    c="y"
    while c=="y":
        print("1.Push")
        print("2.Pop")
        print("3.Display")
        f=int(input("Enter your function choice: "))
        if f==1:
            s=input("Enter element to be pushed:")
            l.append(s)
        elif f==2:
            if l==[]:
                print("Stack is empty")
            else:
                print("Removed item is: ",l.pop())
        elif f==3:
            for x in l:
                print(x)
        else:
            print("Invalid input")
        c=input("Would you like to continue? ")

stacks()
```

# Output 9:

```
1.Push
2.Pop
3.Display
Enter your function choice: 1
Enter element to be pushed:1
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 1
Enter element to be pushed:2
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 1
Enter element to be pushed:2
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 3
1
2
2
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 2
Removed item is:  2
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 3
1
2
Would you like to continue? y
1.Push
2.Pop
3.Display
Enter your function choice: 4
Invalid input
Would you like to continue? n
```

# #Program 10:

```
'''
Program to count the no. of vowels present in a file
story.txt. If the story.txt contents are as follows:
My first book
was Me and
My Family. It
gave Me
a chance to be
Known to the
world.
--------------
The output should read :
Total no. of Vowels =  21
'''

def countv():
    num=0
    f=open("story.txt","r")
    n=f.read()
    for x in n.lower() :
        if x in ['a','e','i','o','u']:
            num=num+1
    f.close()
    print("Total no. of Vowels = ", num)

countv()
```

# Output 10:

```
Total no. of Vowels =  21
```

# #Program 11:

```
'''
Programme to read, write and append a text file.
'''

def fread():
    print("1.Only read")
    print("2.Read and write")
    c2=int(input("Enter your choice: "))
    if c2==1:
         f=open('story.txt','r')
         r=f.read()
         print(r)
         f.close()
    elif c2==2:
         f=open('story.txt','r+')
         r=f.read()
         print(r)
         f.seek(0)
         i=input("Enter what you would like to write:")
         f.write(i)
         f.close()
    else:
        print("Invalid input")

def fwrite():
    print("1.Only write")
    print("2.Write and read")
    c2=int(input("Enter your choice: "))
    if c2==1:
         f=open('story.txt','w')
         i=input("Enter what you would like to write: ")
         w=f.write(i)
         f.close()
    elif c2==2:
         f=open('story.txt','w+')
         i=input("Enter what you would like to write: ")
         f.write(i)
         f.seek(0)
         r=f.read()
         print(r)
         f.close()
    else:
        print("Invalid input")
```

```
def fappend():
    print("1.Only append")
    print("2.Append and read")
    c2=int(input("Enter your choice: "))
    if c2==1:
         f=open('story.txt','a')
         i=input("Enter what you would like to append: ")
         f.write(i)
         f.close()
    elif c2==2:
         f=open('story.txt','a+')
         i=input("Enter what you would like to append: ")
         a=f.write(i)
         f.seek(0)
         r=f.read()
         print(r)
         f.close()
    else:
        print("Invalid input")

def menu():
    c="y"
    while c=="y":
        print("1.Read")
        print("2.Write")
        print("3.Append")
        c1=int(input("Enter your choice: "))
        if c1==1:
            fread()
        elif c1==2:
            fwrite()
        elif c1==3:
            fappend()
        else:
            print("Invalid input")
        c=input("Would you like to continue? ")

menu()
```

# Output 11:

```
1.Read
2.Write
3.Append
Enter your choice: 1
1.Only read
2.Read and write
Enter your choice: 1
My first book
Was me and
My family. It
Gave Me
A chance to be
Known to the
World.
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 1
1.Only read
2.Read and write
Enter your choice: 2
My first book
Was me and
My family. It
Gave Me
A chance to be
Known to the
World.
Enter what you would like to write:testing_r+
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 1
1.Only read
2.Read and write
Enter your choice: 1
testing_r+ook
Was me and
My family. It
Gave Me
A chance to be
Known to the
World.
```

```
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 2
1.Only write
2.Write and read
Enter your choice: 1
Enter what you would like to write: testing_w
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 1
1.Only read
2.Read and write
Enter your choice: 1
testing_w
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 2
1.Only write
2.Write and read
Enter your choice: 2
Enter what you would like to write: testing_w+
testing_w+
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 3
1.Only append
2.Append and read
Enter your choice: 1
Enter what you would like to append: testing_a
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 1
1.Only read
2.Read and write
Enter your choice: 1
testing_w+testing_a
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 3
1.Only append
2.Append and read
Enter your choice: 2
Enter what you would like to append: testing_a+
testing_w+testing_atesting_a+
Would you like to continue? n
```

# #Program 12:

```
'''
Programme to read, write and append a csv file.
'''

import csv

def fread():
    with open('demo_csv.csv', mode="r") as csv_file:
        reader = csv.reader(csv_file)
        for item in reader:
            print(item)

def fwrite():
    column_name = ["Name", "Sex", "Age", "Height (in)", "Weight (lbs)"]
    inm=input("Enter name: ")
    isx=input("Enter sex: ")
    iage=int(input("Enter age: "))
    iht=int(input("Enter height: "))
    iwt=int(input("Enter weight: "))
    data = [ inm, isx, iage, iht, iwt]
    with open('demo_csv.csv', 'w') as f:
        writer = csv.writer(f)
        writer.writerow(column_name)
        writer.writerow(data)

def fappend():
    field_names = ['Name','Sex','Age','Height (in)','Weight (lbs)']
    inm=input("Enter name: ")
    isx=input("Enter sex: ")
    iage=int(input("Enter age: "))
    iht=int(input("Enter height: "))
    iwt=int(input("Enter weight: "))
    dict = {"Name": inm, "Sex":isx,"Age":iage, "Height (in)":iht, "Weight (lbs)": iwt}
    with open('demo_csv.csv', 'a') as csv_file:
        dict_object = csv.DictWriter(csv_file, fieldnames=field_names)
        dict_object.writerow(dict)

def menu():
    c="y"
    while c=="y":
        print("1.Read")
        print("2.Write")
        print("3.Append")
        c1=int(input("Enter your choice: "))
        if c1==1:
            fread()
        elif c1==2:
            fwrite()
        elif c1==3:
            fappend()
        else:
            print("Invalid input")
        c=input("Would you like to continue? ")

menu()
```

*The following csv file demo_csv.csv is used in this programme:*

```
"Name",     "Sex", "Age", "Height (in)", "Weight (lbs)"
"Alex",       "M",   41,       74,      170
"Elly",       "F",   30,       66,      124
"Hank",       "M",   30,       71,      158
"Ivan",       "M",   53,       72,      175
"Page",       "F",   31,       67,      135
```

# Output 12:

```
1.Read
2.Write
3.Append
Enter your choice: 1
['Name', '     "Sex"', ' "Age"', ' "Height (in)"', ' "Weight (lbs)"']
['Alex', '       "M"', '   41', '       74', '      170']
['Elly', '       "F"', '   30', '       66', '      124']
['Hank', '       "M"', '   30', '       71', '      158']
['Ivan', '       "M"', '   53', '       72', '      175']
['Page', '       "F"', '   31', '       67', '      135']
```

```
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 2
Enter name: Gwen
Enter sex: F
Enter age: 26
Enter height: 64
Enter weight: 121
```

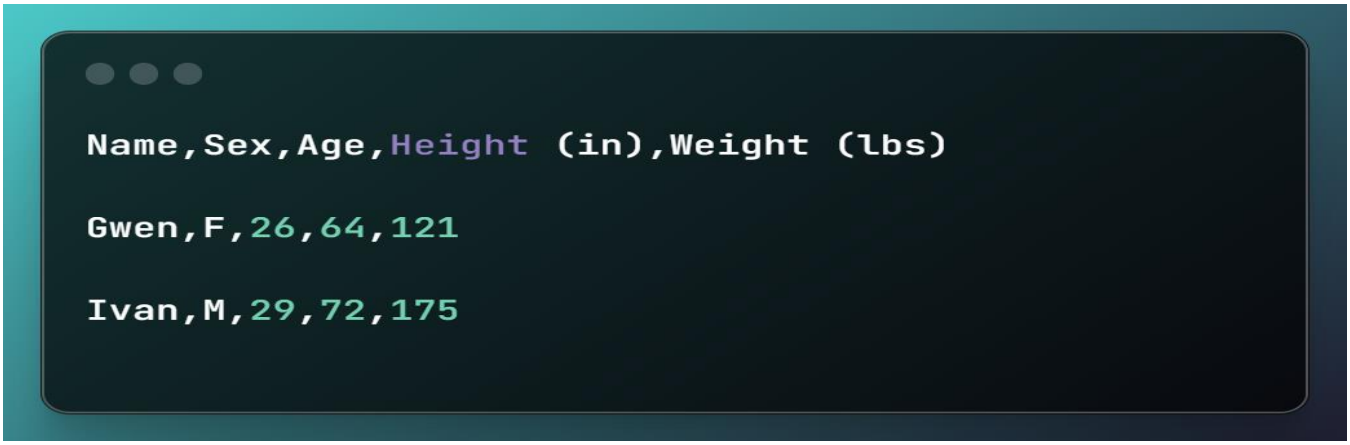
*The csv file now reads:*

```
Name,Sex,Age,Height (in),Weight (lbs)

Gwen,F,26,64,121
```

*The terminal shows:*

```
Would you like to continue? y
1.Read
2.Write
3.Append
Enter your choice: 3
Enter name: Ivan
Enter sex: M
Enter age: 29
Enter height: 72
Enter weight: 175
Would you like to continue? n
```

*The csv file reads:*



```
Name,Sex,Age,Height (in),Weight (lbs)

Gwen,F,26,64,121

Ivan,M,29,72,175
```

# #Program 13:

```
'''
Programme using pickle module- pickle.load and pickle.dump .
'''

import pickle

fd=open('studentdetails.dat','ab')
name=input("Enter the student's name: ")
roll=input("Enter the student's roll no.: ")
marks=input("Enter the student's marks: ")
l=[name, roll, marks]
pickle.dump(l,fd)
fd.close()

fl=open('studentdetails.dat','rb')
pickle.load(fl)
fl.close()
```

# Output 13:

```
Enter the student's name: sc
Enter the student's roll no.: 38
Enter the student's marks: 70
```

# #Program 14:

```
'''
Programme to remove all the lines that contain the character 'a' in a file and
write it to another file.
'''

def read_a():
    global l
    l=[]
    f=open("story.txt","r")
    fl=f.readlines()
    for line in fl:
        for ch in line:
            if ch=='a':
                line=line.replace("\n","")
                l.append(line)
                break
    f.close()

def write_a():
    for i in l:
        f=open("story1.txt","a")
        f.write(i)
        f.close()
        f=open("story1.txt","a")
        f.write("\n")
        f.close()

def remove_a():
    global l1
    l1=[]
    f=open("story.txt","r+")
    global fl
    fl=f.readlines()
    a=0
    for line in fl:
        a=line.find("a")
        if a == -1:
            line=line.replace("\n","")
            l1.append(line)
    for i in l1:
        if i==l1[0]:
            f=open("story.txt","w")
            f.write(i)
            f.close()
            f=open("story.txt","a")
            f.write("\n")
            f.close()
        else:
            f=open("story.txt","a")
            f.write(i)
            f.close()
            f=open("story.txt","a")
            f.write("\n")
            f.close()

read_a()
write_a()
remove_a()
```

*The story.txt file used in this programme is as follows:*

```
My first book
Was me and
My family. It
Gave Me
A chance to be
Known to the
World.
```

# Output 14:

*After running the programme, story.txt read:*

```
My first book
Known to the
World.
```

*While the newly formed story1.txt file read :*

```
Was me and
My family. It
Gave Me
A chance to be
```

# #Program 15: