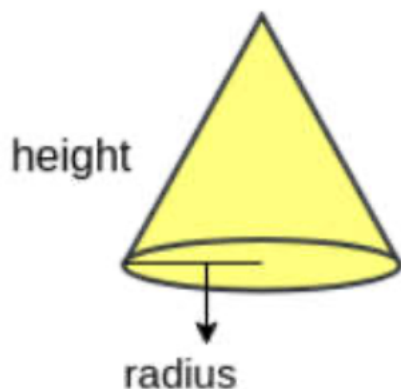


PROBLEM SHEET

05/11/2020

ACTIVITY 1

Write a python program to find the volume of a cone.



ALGORITHM:

STEP 1 . Start

STEP 2 . Import math to use the value of pie .

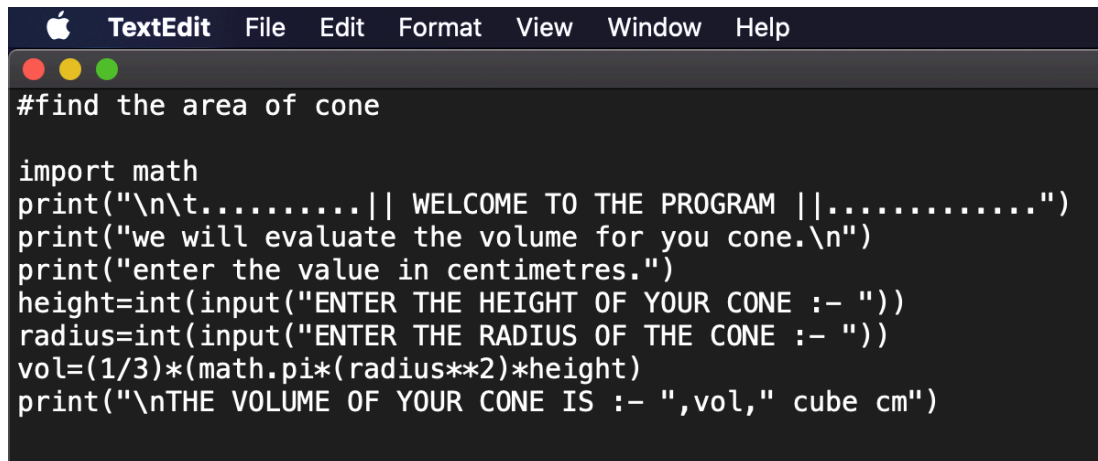
STEP 3 . Read height and radius as the height and radius of the cone respectively from user.

STEP 4 . Evaluate $vol = (1/3) \pi * (radius^2) * height$
($vol = (1/3) * (math.pi * (radius**2) * height)$) as volume of cone

STEP 5 . Print the vol as volume of the cone.

STEP 6 . stop

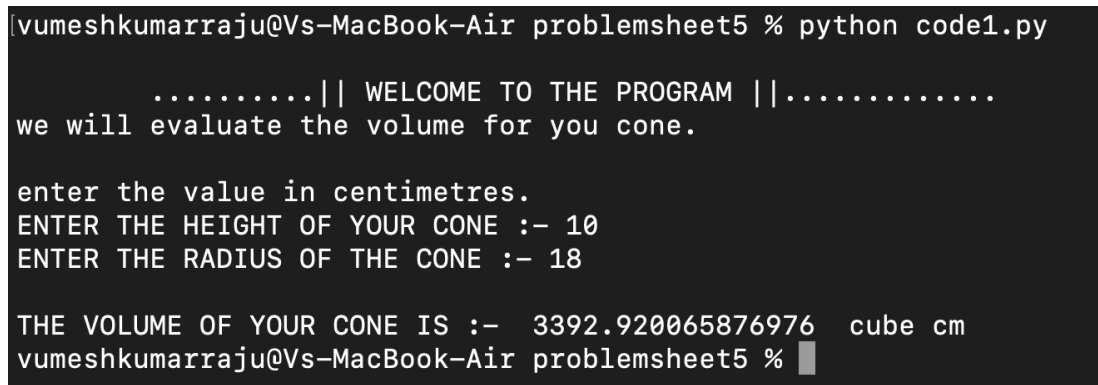
PROGRAM:

A screenshot of a TextEdit window on a Mac. The window has a title bar with the Apple logo and the text 'TextEdit'. Below the title bar are three colored window control buttons (red, yellow, green). The menu bar shows 'File', 'Edit', 'Format', 'View', 'Window', and 'Help'. The main text area contains a Python script to calculate the volume of a cone. The script starts with a comment '#find the area of cone', imports the 'math' module, and prints a welcome message. It then prompts the user to enter the height and radius of the cone, calculates the volume using the formula $V = \frac{1}{3} \pi r^2 h$, and prints the result in cube centimeters.

```
#find the area of cone

import math
print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will evaluate the volume for you cone.\n")
print("enter the value in centimetres.")
height=int(input("ENTER THE HEIGHT OF YOUR CONE :- "))
radius=int(input("ENTER THE RADIUS OF THE CONE :- "))
vol=(1/3)*(math.pi*(radius**2)*height)
print("\nTHE VOLUME OF YOUR CONE IS :- ",vol," cube cm")
```

OUTPUT:

A screenshot of a terminal window. The prompt is '[vumeshkumarraju@Vs-MacBook-Air problemsheet5 %]'. The user has run the command 'python code1.py'. The output of the program is displayed, showing the welcome message, the prompt to enter values, the user's input of height 10 and radius 18, and the final calculated volume of 3392.920065876976 cube cm. The terminal prompt is at the end of the last line of output.

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code1.py

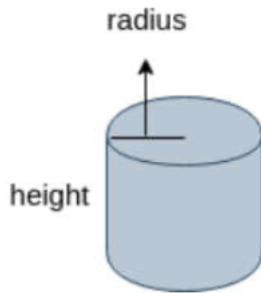
.....|| WELCOME TO THE PROGRAM ||.....
we will evaluate the volume for you cone.

enter the value in centimetres.
ENTER THE HEIGHT OF YOUR CONE :- 10
ENTER THE RADIUS OF THE CONE :- 18

THE VOLUME OF YOUR CONE IS :- 3392.920065876976 cube cm
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 %]
```

ACTIVITY 2

Write a python program to find the volume of a cylinder.



ALGORITHM:

STEP 1 . Start

STEP 2 . Import math to use the value of π .

STEP 3 . Read height and radius as the height and radius of the cylinder respectively from user.

STEP 4 . Evaluate $vol = \pi * (radius^2) * height$
($vol = \text{math.pi} * (radius^{**2}) * height$) as volume of cylinder

STEP 5 . Print the vol as volume of the cylinder.

STEP 6 . stop

PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#volume of cylinder

import math
print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will evaluate the volume for you cylinder.\n")
print("enter the values of height and radius in centimetres.")
height=int(input("ENTER THE HEIGHT OF YOUR CYLINDER :- "))
radius=int(input("ENTER THE RADIUS OF BASE OF THE CYLINDER :- "))
vol=math.pi*(radius**2)*height
print("\nTHE VOLUME OF YOUR CYLINDER IS :- ",vol," cube cm")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code2.py

.....|| WELCOME TO THE PROGRAM ||.....
we will evaluate the volume for you cylinder.

enter the values of height and radius in centimetres.
ENTER THE HEIGHT OF YOUR CYLINDER :- 10
ENTER THE RADIUS OF BASE OF THE CYLINDER :- 20

THE VOLUME OF YOUR CYLINDER IS :- 12566.370614359173 cube cm
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 3

Write a python program to convert Celsius into Fahrenheit.

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read c_temp as the temperature in Celsius .*

STEP 3 . *Evaluate $f_temp=((c_temp*9)/5)+32$ as the temperature in Fahrenheit.*

STEP 4 . *Print f_temp as the converted temperature in Fahrenheit.*

STEP 5 . *stop*

PROGRAM:

```
#convert Celsius into fahrenheit

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will convert the celcius to fahrenheit.\n")
print("enter the temprature in CELCIUS.")
c_temp=float(input("ENTER THE TEMPRATURE IN DEGREE CELCIUS :- "))
f_temp=((c_temp*9)/5)+32
print("TEMPRATURE IN FAHRENHEIT :- ",f_temp)
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code3.py

.....|| WELCOME TO THE PROGRAM ||.....
we will convert the celcius to fahrenheit.

enter the temprature in CELCIUS.
ENTER THE TEMPRATURE IN DEGREE CELCIUS :- 32
TEMPRATURE IN FAHRENHEIT :- 89.6
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 4

Write a python program to find the simple interest

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read p , r , t as the principal amount, rate of interest, time from user.*

STEP 3 . *Evaluate $si = p*r*t/100$ as the simple interest.*

STEP 4 . *Print si as the simple interest.*

STEP 5 . *Stop*

PROGRAM:

```
#finding the simple interest

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will find the simple interest.\n")
p=float(input("PLEASE ENTER THE PRINCIPAL AMOUNT :- "))
r=float(input("PLEASE ENTER THE RATE OF INTEREST :- "))
t=float(input("PLEASE ENTER THE TIME PERIOD (IN YEARS) :- "))
si=p*r*t/100
print("THE SIMPLE INTEREST IS :- ",si," /- ")
```

OUTPUT:

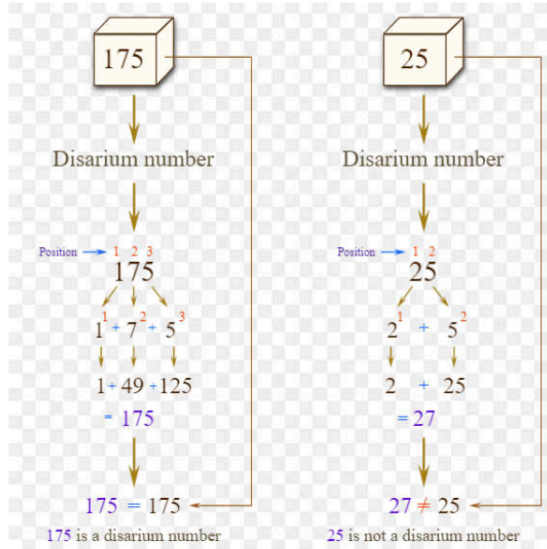
```
vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code4.py

.....|| WELCOME TO THE PROGRAM ||.....
we will find the simple interest.

PLEASE ENTER THE PRINCIPAL AMOUNT :- 520000
PLEASE ENTER THE RATE OF INTEREST :- 12
PLEASE ENTER THE TIME PERIOD (IN YEARS) :- 7
THE SIMPLE INTEREST IS :- 436800.0 /-
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 5

Write a python program to check whether number is disarium number.



ALGORITHM:

STEP 1 . Start

STEP 2 . Read num as the integer to be checked.

STEP 3 . Initialize count=0, sum=0, num1=num, num_check=num

STEP 4 . Count the number of digits in num

(1) While num not equals to 0 (num!=0)

(a) Update count = count+1

(b) num1=integer part of num/10

STEP 5 . for the value of i between count to 0

(1) evaluate dig = num%10 (remainder when num is divided by 10).

(2) Update sum=sum+digⁱ (sum=sum+dig**i)

(3) num=integer part of num/10

(4) i = i-1

STEP 6 . check if sum equals to num_check (sum==num_check) then
print number is a disarium number

else print the number is not a disarium number.

STEP 7 . Stop

PROGRAM:

```
#to check weather a number is disarium or not

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will check weather your entered number is disarium or not.")
num=int(input("ENTER AN INTEGER = "))
count=0
sum=0
num1=num
num_check=num
while num1!=0:
    count+=1
    num1=int(num1/10)
for i in range(count,0,-1):
    dig=num%10
    sum=sum+dig**i
    num=int(num/10)
print("the sum of the digits to the pwoer to their places = ",sum)
if sum==num_check:
    print(num_check," is a disarium number.")
else:
    print(num_check," is not a disarium number.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code5.py
.....|| WELCOME TO THE PROGRAM ||.....
we will check weather your entered number is disarium or not.
ENTER AN INTEGER = 175
the sum of the digits to the pwoer to their places = 175
175 is a disarium number.
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code5.py
.....|| WELCOME TO THE PROGRAM ||.....
we will check weather your entered number is disarium or not.
ENTER AN INTEGER = 224
the sum of the digits to the pwoer to their places = 70
224 is not a disarium number.
vumeshkumarraju@Vs-MacBook-Air problemsheet5 % █
```


ACTIVITY 6

Write a python program to print all the disarium number between a given range.

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read a and b as the starting range and ending range respectively.*

STEP 3 . *For the value of x between a to b+1*

(1) *Initialize num=x, count=0, sum=0, num1=num*

(2) *Count the number of digits in num*

While num not equals to 0 (num!=0)

(a) Update count = count+1

(b) num1=integer part of num/10

(3) *for the value of i between count to 0*

a. evaluate dig = num%10 (remainder when num is divided by 10).

*b. Update sum=sum+digⁱ (sum=sum+dig**i)*

c. num=integer part of num/10

d. i = i-1

(4) *if sum==x then print x end with space.*

STEP 4 . *Stop*

PROGRAM:

```
TextEdit File Edit Format View Window Help
code6.py
#to show all the disarium number in a given range

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will print all the disarium numbers in your entered range.")
a=int(input("enter the starting range = "))
b=int(input("enter the ending range = "))
print("THE DISARIUM NUMBERS BETWEEN ",a," AND ",b,end=" ARE :-")
for x in range(a,b+1):
    num=x
    count=0
    sum=0
    num1=num
    while num1!=0:
        count+=1
        num1=int(num1/10)
    for i in range(count,0,-1):
        dig=num%10
        sum=sum+dig**i
        num=int(num/10)
    if(sum==x):
        print(x,end=" ")
```

OUTPUT:

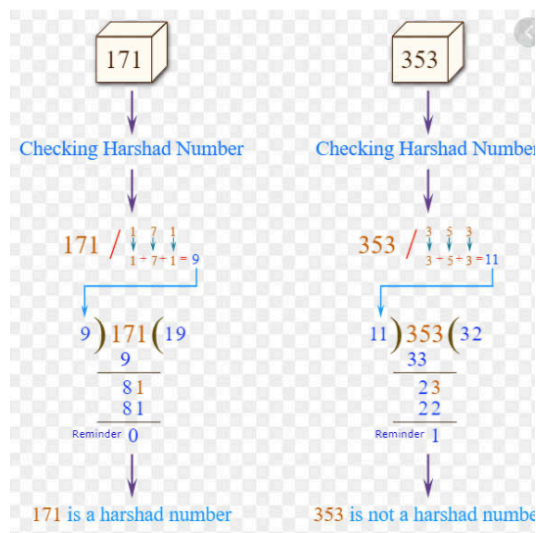
```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code6.py

.....|| WELCOME TO THE PROGRAM ||.....
we will print all the disarium numbers in your entered range.
enter the starting range = 1
enter the ending range = 180
THE DISARIUM NUMBERS BETWEEN 1 AND 180 ARE :-1 2 3 4 5 6 7 8 9 89 135 175 %
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 7

Write a python program to check weather a number is harshad number.

A number is said to be harshad number if it is divisible by the sum of the digit.



ALGORITHM:

STEP 1 . Start

STEP 2 . Read num a the integer to be checked.

STEP 3 . Initialize num_copy=num, sum=0

STEP 4 . While num not equals to zero (num!=0)

a) Evaluate dig=num%10(remainder when num divided by 10)

b) Update sum=sum+dig

c) Update num=integer part of num/10(num=int(num/10))

STEP 5 . If num_copy%sum==0(remainder is 0 when num_copy is divided by sum) print num_copy is a harshad number

Else print num_copy is not a harshad number.

STEP 6 . Stop

PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#to check weather a nu,mber is harshad number or not

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will check wether your entered number is harshad or not.\n")
num=int(input("ENTER AN INTEGER = "))
num_copy=num
sum=0
while num!=0:
    dig=num%10
    sum=sum+dig
    num=int(num/10)
if num_copy%sum==0:
    print(num_copy," IS A HARSHAD NUMBER.")
else:
    print(num_copy," IS NOT A HARSHAD NUMBER.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code7.py

.....|| WELCOME TO THE PROGRAM ||.....
we will check wether your entered number is harshad or not.

ENTER AN INTEGER = 171
171 IS A HARSHAD NUMBER.
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code7.py

.....|| WELCOME TO THE PROGRAM ||.....
we will check wether your entered number is harshad or not.

ENTER AN INTEGER = 5673
5673 IS NOT A HARSHAD NUMBER.
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 8

Write a python program to check weather a number is pronic number.

- A number is said to be pronic number if it is a product of two consecutive numbers.

Example Pronic numbers:

$$6 = 2 \times 3$$

$$72 = 8 \times 9$$

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read num as the number to be checked.*

STEP 3 . *Initialize $k=0, \text{fact}=1, i=1$*

STEP 4 . *While $\text{fact} \leq \text{num}$*

(a) if fact is equal to num ($\text{fact} == \text{num}$)

- *print i , symbol '*', $i+1$, symbol " = " and fact.*
- *print num is a pronic number.*
- *$k=2$*

(b) update $i=i+1$

STEP 5 . *if k equals to 0 ($k==0$) print num is not a pronic number.*

STEP 6 . *Stop*

PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#to check weather a bumber is pronic or not.

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will chck wether your entered number is pronic or not.\n")
num=int(input("ENTER AN INTEGER = "))
k=0
i=1
fact=1
while fact<=num:
    fact=i*(i+1)
    if fact==num:
        print(i,'*',i+1," = ",fact)
        print(num," IS A PRONIC NUMBER.")
        k=2
    i+=1
if k==0:
    print(num," IS NOT A PRONIC NUMBER.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code8.py

.....|| WELCOME TO THE PROGRAM ||.....
we will chck wether your entered number is pronic or not.

ENTER AN INTEGER = 132
11 * 12 = 132
132 IS A PRONIC NUMBER.
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code8.py

.....|| WELCOME TO THE PROGRAM ||.....
we will chck wether your entered number is pronic or not.

ENTER AN INTEGER = 67
67 IS NOT A PRONIC NUMBER.
vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```

ACTIVITY 9

Write a python program to print following pattern.

```
5432*
543*1
54*21
5*321
*4321
```

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read line as the number of lines to be print the pattern*

STEP 3 . *For the value of i in between 1 to line+1*

 (1) *For the value of j in between line to 0*

 (a) *If j equals to i (j==i) print '*' symbol ends with white space*

Else print j end with white space

 (b) *j=j-1 updates after succession of every loop.*

 (2) *print a new line*

 (3) *i=i+1 updates after succession of every loop*

STEP 4 . *stop*

PROGRAM:

```
#printing a pattern using umbers

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will show a pattern as your entered number of lines.\n")
line=int(input("ENTER NUMBER OF LINES = "))
for i in range(1,line+1):
    for j in range(line,0,-1):
        if i==j:
            print('*',end=" ")
        else:
            print(j,end=" ")
    print("\n")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code9.py
```

```
.....|| WELCOME TO THE PROGRAM ||.....
we will show a pattern as your entered number of lines.
```

```
ENTER NUMBER OF LINES = 7
```

```
7 6 5 4 3 2 *
```

```
7 6 5 4 3 * 1
```

```
7 6 5 4 * 2 1
```

```
7 6 5 * 3 2 1
```

```
7 6 * 4 3 2 1
```

```
7 * 5 4 3 2 1
```

```
* 6 5 4 3 2 1
```

```
vumeshkumarraju@Vs-MacBook-Air problemsheet5 % █
```


ACTIVITY 10

Write a python program to print following pattern.

```
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64
9 18 27 36 45 54 63 72 81
10 20 30 40 50 60 70 80 90 100
```

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read line as number of lines to print the pattern.*

STEP 3 . *For the value of i between 1 to line+1*

(1) For the value of j between 1 to i+1

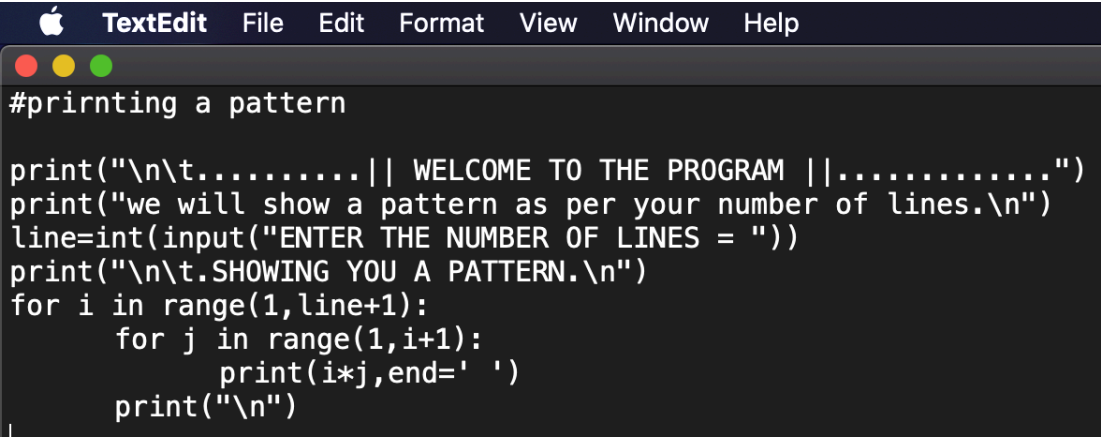
*(a) Print the value of $i*j$ end with a white space.*

(2) Print a new line

(3) $i=i+1$ after every succession of loop.

STEP 4 . *Stop*

PROGRAM:



```
TextEdit  File  Edit  Format  View  Window  Help
#prirnting a pattern

print("\n\t.....|| WELCOME TO THE PROGRAM ||.....")
print("we will show a pattern as per your number of lines.\n")
line=int(input("ENTER THE NUMBER OF LINES = "))
print("\n\t.SHOWING YOU A PATTERN.\n")
for i in range(1,line+1):
    for j in range(1,i+1):
        print(i*j,end=' ')
    print("\n")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet5 % python code10.py

.....|| WELCOME TO THE PROGRAM ||.....
we will show a pattern as per your number of lines.

ENTER THE NUMBER OF LINES = 15

.SHOWING YOU A PATTERN.

1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64
9 18 27 36 45 54 63 72 81
10 20 30 40 50 60 70 80 90 100
11 22 33 44 55 66 77 88 99 110 121
12 24 36 48 60 72 84 96 108 120 132 144
13 26 39 52 65 78 91 104 117 130 143 156 169
14 28 42 56 70 84 98 112 126 140 154 168 182 196
15 30 45 60 75 90 105 120 135 150 165 180 195 210 225

vumeshkumarraju@Vs-MacBook-Air problemsheet5 %
```