Q.Happy number

In [4]:
```
n=int(input("Enter number:"))
temp=n
while n!=1 and n!=4:
    print(n)
    sum=0
    s=str(n)
    for i in s:
        sum+=int(i)**2
    n=sum
if n==1:
    print(temp,"is Happy number")
else:
    print(temp,"is not a Happy number")
```

```
Enter number:41
41
17
50
25
29
85
89
145
42
20
41 is not a Happy number
```

In [7]:
```
n=int(input("Enter number"))
x=n
while n!=1 and n!=4:
    print(n)
    sum=0
    temp=n
    while temp>0:
        digit=temp%10
        sum+=digit**2
        temp//=10
    n=sum
if sum==1:
    print(x,"is Happy number")
else:
    print(x,"is not a Happy number")
```

```
Enter number13
13
10
13 is Happy number
```

Q.Calculate salary

input: grade level,city class

Grade levels.....Basic Pag.....Other allowances

A.....60000.....8000

B.....50000.....7000

C.....40000.....6000

D.....30000.....5000

E.....10000.....4000

F.....10000.....3000

Gross pay =Basic pay + HRA + DA +other allowances + TA - Professional Tax - EPF

- HRA

city

class-1 0.3 of basic pay class-2 0.2 of basic pay class-3 0.1 of basic pay

- Professional Tax-200Rs./month
- DA 0.5 times of basic pay
- EPF 0.11 times of basic pay
- TA 900 Rs./month

Amount.....Tax Rate

upto Rs.2,50,000.....0%

2,50,001 to 5,00,000.....5% above 2,50,000

5,00,001 to 7,50,000.....10% above 5,00,000 + 12500

7,50,001 to 10,00,000.....15% above 7,50,000 + 37500

10,00,001 to 12,50,000.....20% above 10,00,000 + 75000

12,50,001 to 15,00,000.....25% above 12,50,000 + 1,25,000

Above 15,00,000.....30% above 15,00,000 + 1,87,500

In [1]:
```
grade=input("Enter your grade:")
cityClass=int(input("Enter your class:"))
Professional_tax=200
TA=900

if(grade in 'aA'):
    basic_pay=60000
    Other_allowance=8000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
    elif(cityClasss==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
```

```
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

elif(grade in 'bB'):
    basic_pay=50000
    Other_allowance=7000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
    elif(cityClass==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

elif(grade in 'cC'):
    basic_pay=40000
    Other_allowance=6000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
    elif(cityClass==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

elif(grade in 'dD'):
    basic_pay=30000
    Other_allowance=5000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
    elif(cityClasss==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

elif(grade in 'eE'):
    basic_pay=20000
    Other_allowance=4000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
```

```
    elif(cityClass==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

elif(grade in 'fF'):
    basic_pay=10000
    Other_allowance=3000
    DA=basic_pay*0.5
    EPF=basic_pay*0.11
    if(cityClass==1):
        HRA=basic_pay*0.3
    elif(cityClass==2):
        HRA=basic_pay*0.2
    elif(cityClass==3):
        HRA=basic_pay*0.1
    Salary=basic_pay+HRA+DA+Other_allowance+TA-Professional_tax-EPF
    print("Monthly Salary:",Salary)
    annual_salary=Salary*12
    print("Annual Salary:",annual_salary)

if(annual_salary<=250000):
    print("No tax to be paid")
elif(annual_salary>250001 and annual_salary<50000):
    tax=0.05*annual_salary
    annual_salary-=tax
    print(tax)
elif(annual_salary> 1250001 and annual_salary<1500000):
    tax= 0.25*annual_salary+125000
    annual_salary-=tax
    print(tax)
    print(annual_salary)
# if annual_salary <= 250000:
#     print("No need to pay income tax")
# elif annual_salary > 250000 and annual_salary <= 500000:
#     salary = annual_salary * 0.05
#     print("Your Payable Income Tax : ",salary + 12500)
# elif annual_salary > 500000 and annual_salary <= 7500000:
#     salary = annual_salary * 0.10
#     print("Your Payable Income Tax : ",salary + )
# elif annual_salary > 750000 and annual_salary <= 1000000:
#     salary = annual_salary * 0.3
#     print("Your Payable Income Tax : ",salary)
# elif annual_salary > 1000000 and annual_salary <= 1250000:
#     salary = annual_salary * 0.5
#     print("Your Payable Income Tax : ",salary)
# elif annual_salary > 1250000 and annual_salary <= 1500000:
#     salary = annual_salary * 0.75
#     print("Your Payable Income Tax : ",salary)
# else:
#     salary = annual_salary * 1.05
#     print("Your Payable Income Tax : ",salary)
```

```
Enter your grade:a
Enter your class:1
Monthly Salary: 110100.0
```

```
Annual Salary: 1321200.0
455300.0
865900.0
```

9 Marker Like Question

Grade Levels => A, B, C, D, E, F

Basic Pay => 60k, 50k, 40k, 30k, 20k, 10k

Other => 8k, 7k, 6k, 5k, 4k, 3k

Gross Pay = Basic Pay + HRA + DA + other + TA - Professional Tax - EPF

HRA => class 1 = 0.3 of basic pay

=> class 2 = 0.2 of basic pay

=> class 3 = 0.1 of basic pay

Professional Tax => 200 Rs/month

DA => 0.5 times of Basic Pay

EPF => 0.11 times of Basic Pay

TA => 900 Rs/month

In [ ]:
```python
grade_levels = input("Enter your grade level (A to F): ")
city = int(input("Enter your city (class 1 to class 3) : "))

class1 = 0.3
class2 = 0.2
class3 = 0.1
professional_tax = 200
TA = 900
annual_salary = 0

if grade_levels in "aA":
    if city == 1:
        DA = 0.5 * 60000
        EPF = 0.11 * 60000
        gross_pay = 60000 + (60000 * 0.3) + (DA) + 8000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 60000
        EPF = 0.11 * 60000
        gross_pay = 60000 + (60000 * 0.2) + (DA) + 8000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 60000
```

```
        EPF = 0.11 * 60000
        gross_pay = 60000 + (60000 * 0.1) + (DA) + 8000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    else:
        print("Inavlid City !")
elif grade_levels in "bB":
    if city == 1:
        DA = 0.5 * 50000
        EPF = 0.11 * 50000
        gross_pay = 50000 + (50000 * 0.3) + (DA) + 7000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 50000
        EPF = 0.11 * 50000
        gross_pay = 50000 + (50000 * 0.2) + (DA) + 7000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 50000
        EPF = 0.11 * 50000
        gross_pay = 50000 + (50000 * 0.1) + (DA) + 7000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    else:
        print("Inavlid City !")
elif grade_levels in "cC":
    if city == 1:
        DA = 0.5 * 40000
        EPF = 0.11 * 40000
        gross_pay = 40000 + (40000 * 0.3) + (DA) + 6000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 40000
        EPF = 0.11 * 40000
        gross_pay = 40000 + (40000 * 0.2) + (DA) + 6000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 40000
        EPF = 0.11 * 40000
        gross_pay = 40000 + (40000 * 0.1) + (DA) + 6000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        print("Your Annual Salary : ",gross_pay * 12)
    else:
        print("Inavlid City !")
elif grade_levels in "dD":
    if city == 1:
        DA = 0.5 * 30000
        EPF = 0.11 * 30000
        gross_pay = 30000 + (30000 * 0.3) + (DA) + 5000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
```

```
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 30000
        EPF = 0.11 * 30000
        gross_pay = 30000 + (30000 * 0.2) + (DA) + 5000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 30000
        EPF = 0.11 * 30000
        gross_pay = 30000 + (30000 * 0.1) + (DA) + 5000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    else:
        print("Inavlid City !")
elif grade_levels in "eE":
    if city == 1:
        DA = 0.5 * 20000
        EPF = 0.11 * 20000
        gross_pay = 20000 + (20000 * 0.3) + (DA) + 4000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 20000
        EPF = 0.11 * 20000
        gross_pay = 20000 + (20000 * 0.2) + (DA) + 4000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 20000
        EPF = 0.11 * 20000
        gross_pay = 20000 + (20000 * 0.1) + (DA) + 4000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    else:
        print("Inavlid City !")
elif grade_levels in "fF":
    if city == 1:
        DA = 0.5 * 10000
        EPF = 0.11 * 10000
        gross_pay = 10000 + (10000 * 0.3) + (DA) + 3000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 2:
        DA = 0.5 * 10000
        EPF = 0.11 * 10000
        gross_pay = 10000 + (10000 * 0.2) + (DA) + 3000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    elif city == 3:
        DA = 0.5 * 10000
        EPF = 0.11 * 10000
```

```
        gross_pay = 10000 + (10000 * 0.1) + (DA) + 3000 + TA - professional_tax - EPF
        print("Your Monthly Salary : ",gross_pay)
        annual_salary = gross_pay * 12
        print("Your Annual Salary : ",annual_salary)
    else:
        print("Inavlid City !")
else:
    print("Invalid grade level, please enter between A to F")

# if annual_salary <= 250000:
#     print("No need to pay income tax")
# elif annual_salary > 250000 and annual_salary <= 500000:
#     salary = annual_salary * 0.05
#     print("Your Payable Income Tax : ",salary + 12500)
# elif annual_salary > 500000 and annual_salary <= 7500000:
#     salary = annual_salary * 0.10
#     print("Your Payable Income Tax : ",salary + )
# elif annual_salary > 750000 and annual_salary <= 1000000:
#     salary = annual_salary * 0.3
#     print("Your Payable Income Tax : ",salary)
# elif annual_salary > 1000000 and annual_salary <= 1250000:
#     salary = annual_salary * 0.5
#     print("Your Payable Income Tax : ",salary)
# elif annual_salary > 1250000 and annual_salary <= 1500000:
#     salary = annual_salary * 0.75
#     print("Your Payable Income Tax : ",salary)
# else:
#     salary = annual_salary * 1.05
#     print("Your Payable Income Tax : ",salary)
```

Patterns

Q1

/*/

/**/

/***/

/**/

In [1]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print("*",end=" ")
    print()
```

```
Enter no. of rows : 5
*
* *
* * *
* * * *
* * * * *
```

In [2]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows + 1):
```

```
    for j in range(1,i + 1):
        print(i,end=" ")
    print()
```

```
Enter no. of rows : 5
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

In [3]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print(j,end=" ")
    print()
```

```
Enter no. of rows : 5
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

In [4]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print(chr(64+i),end=" ")
    print()
```

```
Enter no. of rows : 5
A
B B
C C C
D D D D
E E E E E
```

In [5]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print(chr(64+j),end=" ")
    print()
```

```
Enter no. of rows : 5
A
A B
A B C
A B C D
A B C D E
```

In [6]:
```
rows = int(input("Enter no. of rows : "))
k = 65
for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print(chr(k),end=" ")
        k += 1
    print()
```

```
Enter no. of rows : 5
A
B C
```

```
D E F
G H I J
K L M N O
```

In [7]:
```
rows = int(input("Enter no. of rows : "))
k = 97
for i in range(1,rows + 1):
    for j in range(1,i + 1):
        print(chr(k),end=" ")
        k += 1
    print()
```

```
Enter no. of rows : 5
a
b c
d e f
g h i j
k l m n o
```

In [8]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(1,i+1):
        if (i % 2 == 0):
            print(0,end=" ")
        else:
            print(1,end=" ")
    print()
```

```
Enter no. of rows : 5
1
0 0
1 1 1
0 0 0 0
1 1 1 1 1
```

In [9]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(1,i+1):
        print((i+j-1) % 2,end=" ")
    print()
```

```
Enter no. of rows : 5
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

In [10]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(1,i+1):
        if(i % 2 == 0):
            print("#",end = " ")
        else:
            print("*", end = " ")
    print()
```

```
Enter no. of rows : 5
*
# #
```

```
* * *
# # # #
* * * * *
```

In [11]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(i,rows+1):
        print("*",end = " ")
    print()
```

```
Enter no. of rows : 5
* * * * *
* * * *
* * *
* *
*
```

In [12]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(i,rows+1):
        print(i,end = " ")
    print()
```

```
Enter no. of rows : 5
1 1 1 1 1
2 2 2 2
3 3 3
4 4
5
```

In [13]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(i,rows+1):
        print(j,end = " ")
    print()
```

```
Enter no. of rows : 5
1 2 3 4 5
2 3 4 5
3 4 5
4 5
5
```

In [14]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(i,rows+1):
        print(rows+1-j,end = " ")
    print()
```

```
Enter no. of rows : 5
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```

In [15]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
```

```
    for j in range(rows,i-1,-1):
        print(j,end = " ")
    print()
```

```
Enter no. of rows : 5
5 4 3 2 1
5 4 3 2
5 4 3
5 4
5
```

In [16]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(1,(rows-i)+2):
        print(j,end = " ")
    print()
```

```
Enter no. of rows : 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

In [17]:
```
rows = int(input("Enter no. of rows : "))
#Sir's Logic
for i in range(1,rows+1):
    for j in range(i,rows + 1):
        print(j-i+1,end = " ")
    print()
```

```
Enter no. of rows : 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

In [18]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(i,rows+1):
        print(" ",end=" ")
    for k in range(1,i+1):
        print("*",end = " ")
    print()
```

```
Enter no. of rows : 5
        *
       * *
      * * *
     * * * *
    * * * * *
```

In [19]:
```
rows = int(input("Enter no. of rows : "))

for i in range(1,rows+1):
    for j in range(rows+1,i,-1):
        print(" ",end=" ")
    for k in range(1,i):
         print("*",end = " ")
    print()
```

```
Enter no. of rows : 5
        *
      * *
    * * *
  * * * *
```

In [ ]: