Nested control structures

```
for iterating_var in sequence:
        for iterating_var in sequence:
                statements(s)
        statements(s)
```

```
if test expression:
        Body of if
elif test expression:
        Body of elif
else:
      Body of else
```

```
while expression:
        while expression:
                statement(s)
        statement(s)
```

Nested if: to check number is zero, positive or negative

```
num = float(input("Enter a number: "))
if num >= 0:
    if num == 0:
        print("Zero")
    else:
        print("Positive number")
else:
    print("Negative number")
```

Finding biggest of three numbers

```
a=10
b=20
c=30
if(a>b):
     if(a>c):
        print("a is big")
     else:
        print("c is big")
elif(b>c):
        print("b is big")
else:
        print("c is big");
```

Finding biggest of three numbers using nested if

(observe the indentation)

Example for nested if

```
gender=input('enter you gender [m/f]')
if gender=='m':
    age=int(input('enter your age: '))
    if age>21:
        print('eligible for marriage')
    else:
        print('not eligible for marriage')
elif gender=='f':
    age=int(input('enter your age: '))
    if age>18:
        print('eligible for marriage')
    else:
        print('not eligible for marriage')
```

Nested for statement

```
for iterating_var in sequence:
    for iterating_var in sequence:
        statements(s)
    statements(s)
```

```
for j in range(1,11):
    print("hello")
```

```
for i in range(1,10+1):
    print(i)
    for j in range(1,10+1):
        print(j,end=" ")
    print()
```

```
for i in range(1,11):
    for j in range(1,11):
        print("hello")
```

Write a program to generate multiplication table

1	2	3	4	5	6	7	8	9	10	11	12
		----------???									
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

Multiplication table

```
m=n=10
for i in range(1,m+1):
    for j in range(2,n+1):
        print(i*j,end="\t")
print()
```

```
for j in range(1,11):
    print(2*j,end="  ")
```

```
i=2 3 4
for j in range(1,11):
    print(i*j,end="  ")
```

```
for i in range(1,11):

    for j in range(1,11):

        print(i*j,end="\t")

    print()
```

Print the following pattern

1 = 1

1 + 2 = 3

1 + 2 + 3 = 6

1 + 2 + 3 + 4 = 10

1 + 2 + 3 + 4 + 5 = 15

To print 1 + 2 + 3 + 4 = 10

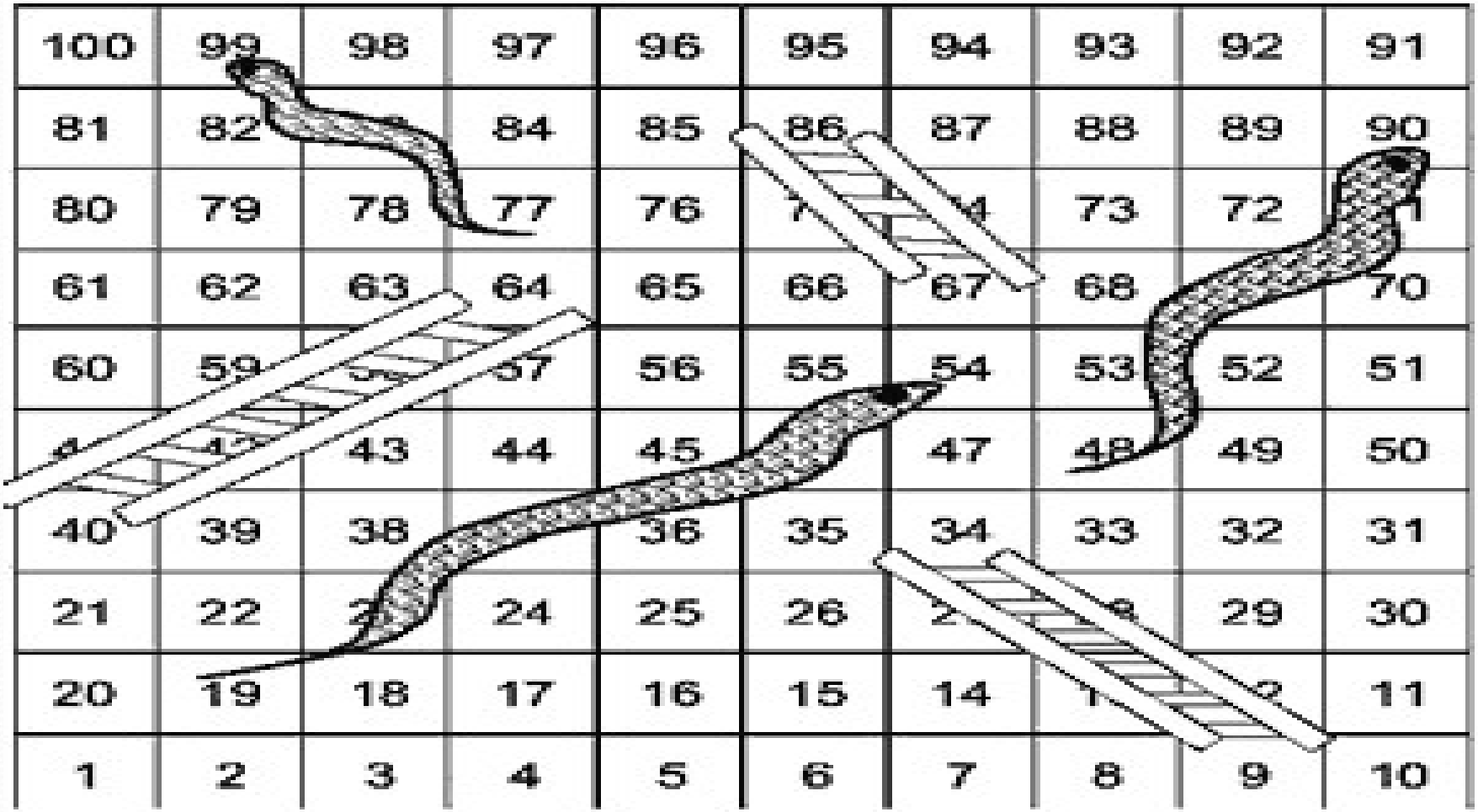
```
n=4
sum=1
print(1,end=" ")
for i in range(2,n+1):
    sum=sum+i
    print('+',i,end=" ")
print("=",sum)
```

```
n=4
sum=0
for i in range(1,n+1):
    sum=sum+i
    print(i,"+",end=" “)
print("=",sum)
```

```
m=5
for n in range(1,m+1):
    sum=1
    print(1,end=" ")
    for i in range(2,n+1):
        sum=sum+i
        print('+',i,end=" ")
    print("=",sum)
```

```
1 = 1
1 + 2 = 3
1 + 2 + 3 = 6
1 + 2 + 3 + 4 = 10
1 + 2 + 3 + 4 + 5 = 15
```

Printing snake ladder



Printing snake ladder

```
100  99  98  97  96  95  94  93  92  91
 81  82  83  84  85  86  87  88  89  90
 80  79  78  77  76  75  74  73  72  71
 61  62  63  64  65  66  67  68  69  70
 60  59  58  57  56  55  54  53  52  51
 41  42  43  44  45  46  47  48  49  50
 40  39  38  37  36  35  34  33  32  31
 21  22  23  24  25  26  27  28  29  30
 20  19  18  17  16  15  14  13  12  11
  1   2   3   4   5   6   7   8   9  10
```

---

snake ladder problem

```
# snake ladder problem
n = 100
for j in range(5) :
    for i in range(n, n - 10, -1):
            print(i, end = " ")
    print()
    n -= 20
    for i in range(n, n + 10) :
            print(i + 1, end = " ")
    print()
```

Generate all 3 digit palindrome numbers.

```
1 0 1
1 1 1
1 2 1
1 3 1
1 4 1
1 5 1
1 6 1
1 7 1
1 8 1
1 9 1
2 0 2
2 1 2
2 2 2
2 3 2
2 4 2
2 5 2
2 6 2
2 7 2
2 8 2
```

Generate all 3 digit palindrome numbers.

```
n = 121
rev = 0
onum=n
while (n) :
        rev = rev * 10 + n % 10
        n //= 10
if(onum==rev):
    print("pali")
else:
    print("not a pal")
```

```
for i in range(1,10):
    for j in range(10):
        print(i, j, i)
```

Pgm to print Fibonacci series up to n

```
      f   s   t
0   1   1   2   3   5   8   13
        f   s   t
```

third=first+second;
assign sec to first
assign third to sec

Pgm to print Fibonacci series up to n

```
n=100
first=0
second=1
third=1
print(first,second,end=" ")
while(third<=n):
        print(third,end=" ")
        third=first+second
        first=second
        second=third
```

Use while wherever we have to

Print the pattern

A

B C D

E F G H I

J K L M N O P

Q R S T U V W X Y

Printing pattern

```
i=65
while(i<90):
        print(chr(i),end=" ")
        if i in (65,68,73,80):print()
        i=i+1
```

```
for i in range(65,91):
    print(chr(i),end=" ")
    if i in (65,68,73,80):print()
```