Programming using Python

Loops
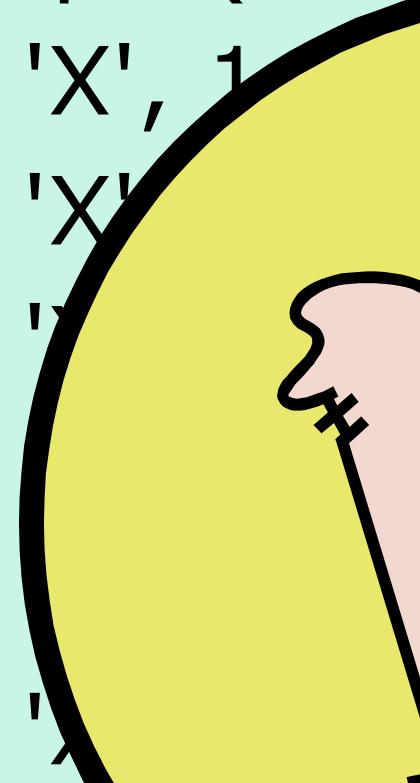
Printing Multiplication Table

|				
2	X	1	=	2
2	X	2	=	4
2	X	3	=	6
2	X	4	=	8
2	X	5	=	10
2	X	6	=	12
2	X	7	=	14
2	X	8	=	16
2	X	9	=	18
2	X	10	=	20
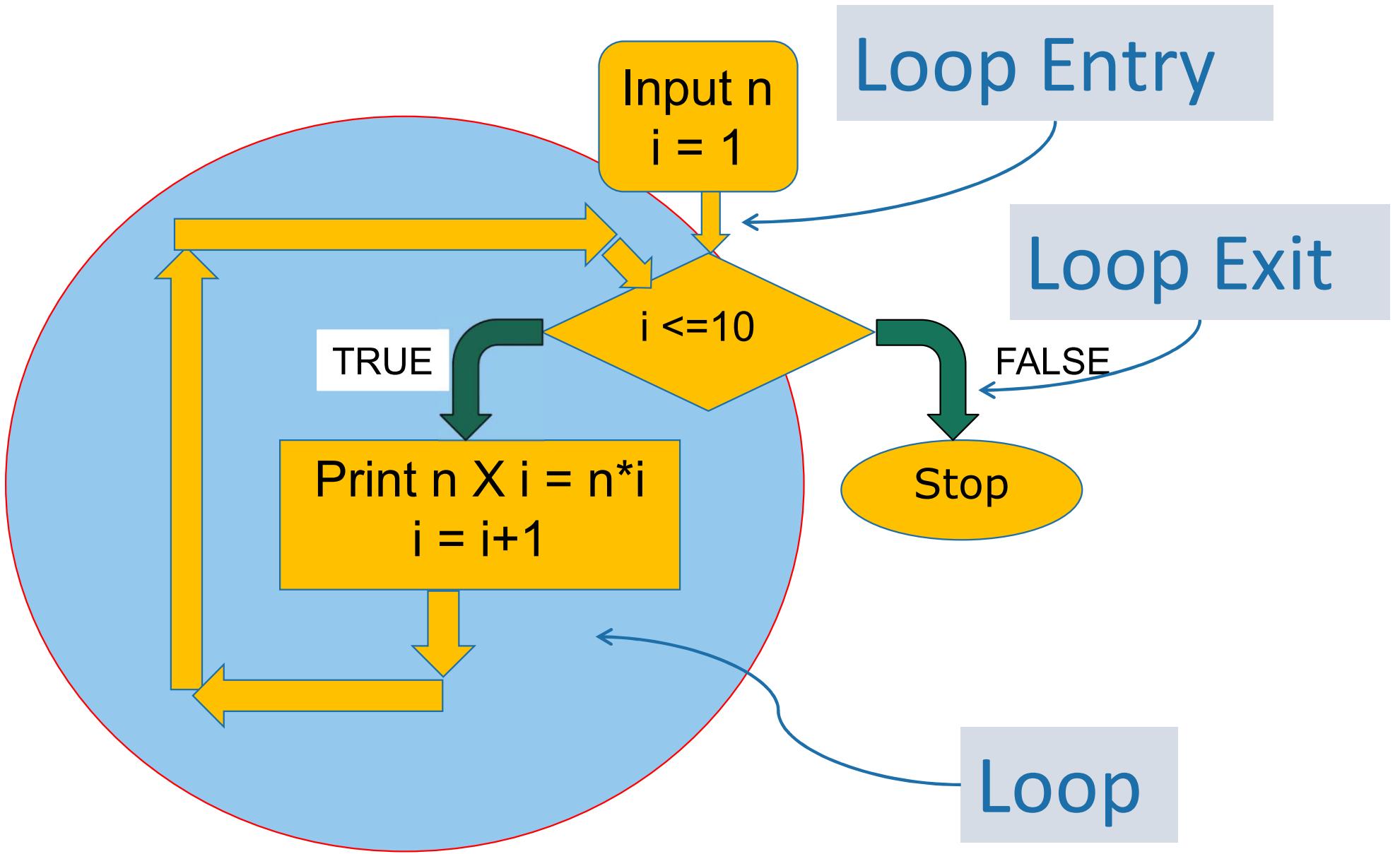
Program…

```
n = int(input('Enter
print (n, 'X', 1
print (n, 'X'
print (n,
print (n,
print (n,
print (n,
....
```
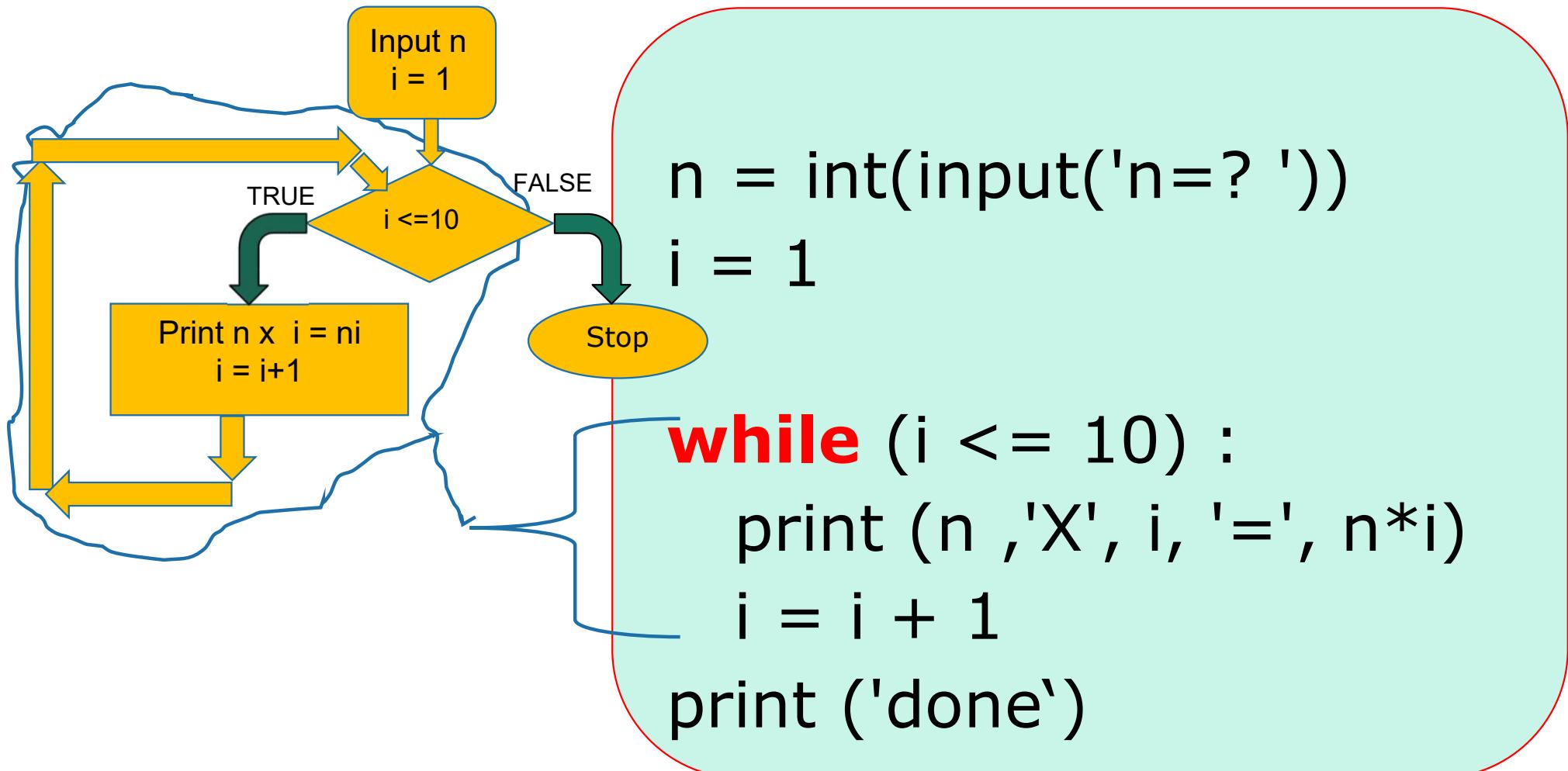
Too much repetition! Can I avoid it?

Printing Multiplication Table

Printing Multiplication Table

Flowchart:

- Input n / i = 1
- i <=10
 - TRUE → Print n x i = ni / i = i+1
  - FALSE → Stop

```python
n = int(input('n=? '))
i = 1

while (i <= 10) :
    print (n ,'X', i, '=', n*i)
    i = i + 1
print ('done')
```
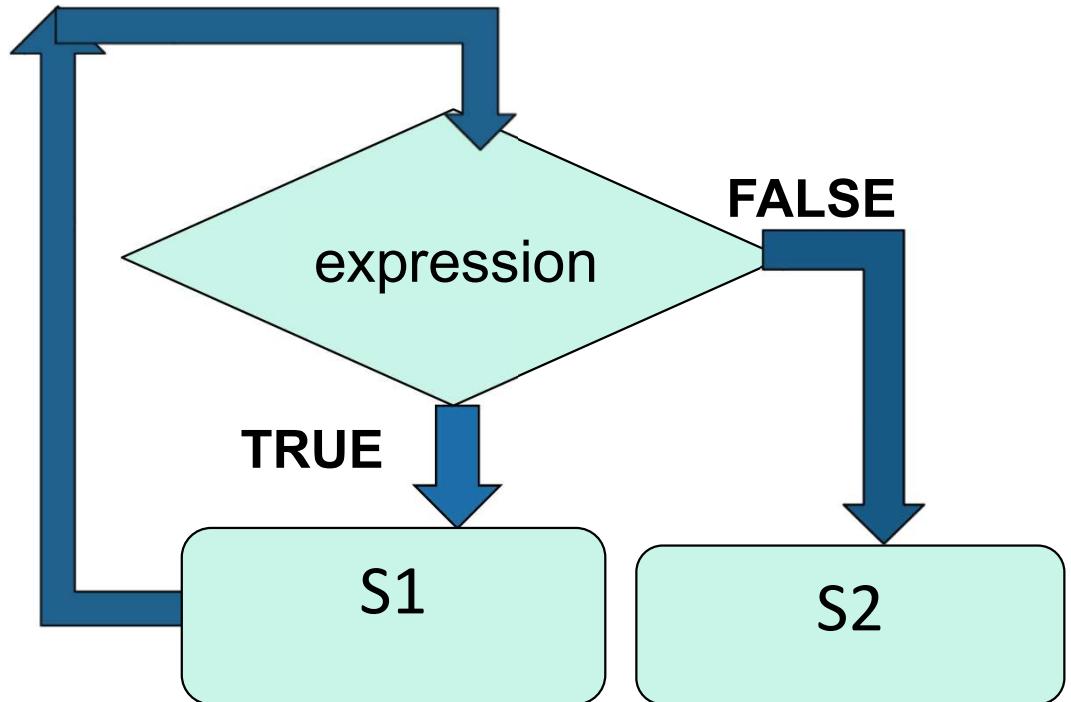
While Statement

> **while** (expression):
>   S1
> S2

1. Evaluate expression

2. If TRUE then
   a)   execute statement1
   b)   goto step 1.

3. If FALSE then execute statement2.

For Loop

- Print the sum of the reciprocals of the first 100 natural numbers.

```python
rsum=0.0# the reciprocal sum

# the for loop
for i in range(1,101):
    rsum = rsum + 1.0/i
print ('sum is', rsum)
```

For loop in Python

- General form

```
for variable in sequence:
    stmt
```

range

- range(s, e, d)
  - generates the list:

  $$[s, s+d, s+2*d, ..., s+k*d]$$

  where $s+k*d < e <= s+(k+1)*d$

- range(s, e) is equivalent to range(s, e, 1)

- range(e) is equivalent to range(0, e)

Exercise: What if d is negative? Use python interpreter to find out.

Quiz

- What will be the output of the following program

```
# print all odd numbers < 10
i = 1
while i <= 10:
    if i%2==0: # even
        continue
    print (i, end=' ')
    i = i+1
```

Continue and Update Expr

- Make sure continue does not bypass update-expression for while loops

```python
# print all odd numbers < 10
i = 1
while i <= 10:
    if i%2==0:   # even
        continue
    print (i, end=' ')
    i = i+1
```

i is not incremented when even number encountered. Infinite loop!!