CSE 20 5-7-20

Ex. Sum.py

How does sum3 work?

formula:

$$1 + 2 + 3 + \cdots + n = \frac{n(n+1)}{2}$$

Why?

let $S = 1 + 2 + 3 + \cdots + (n-2) + (n-1) + n$

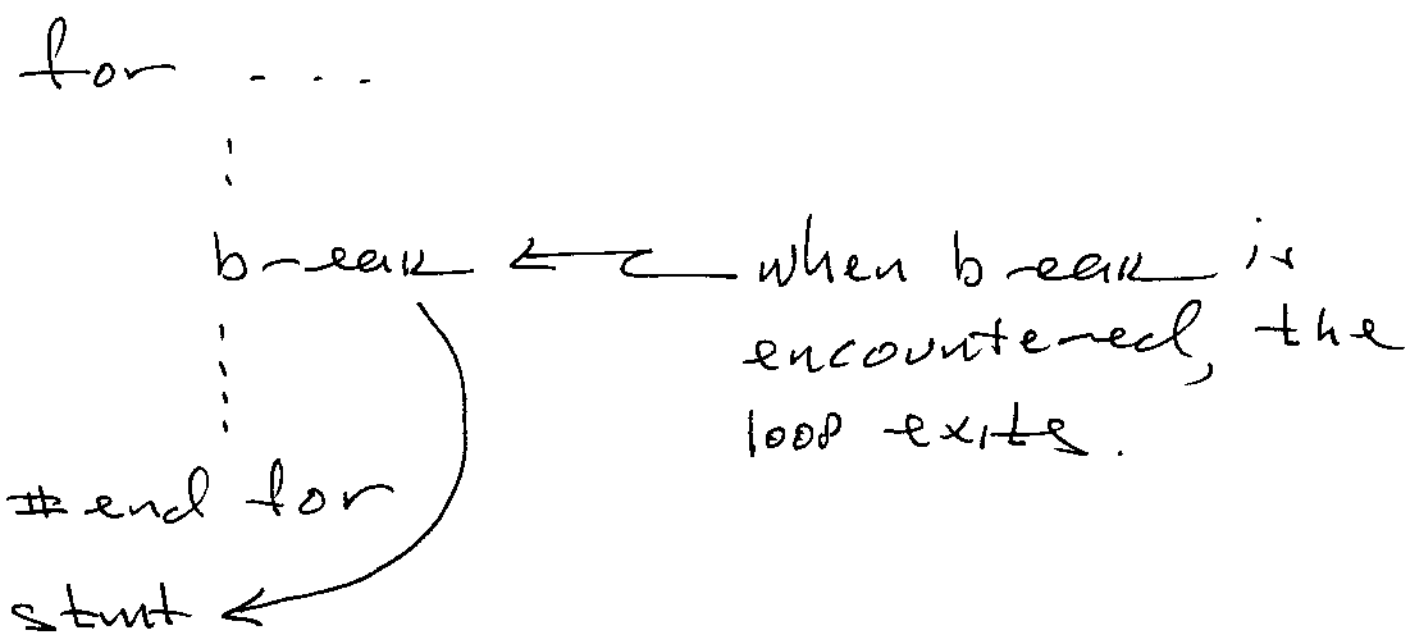
$S = n + (n-1) + (n-2) + \cdots + 3 + 2 + 1$

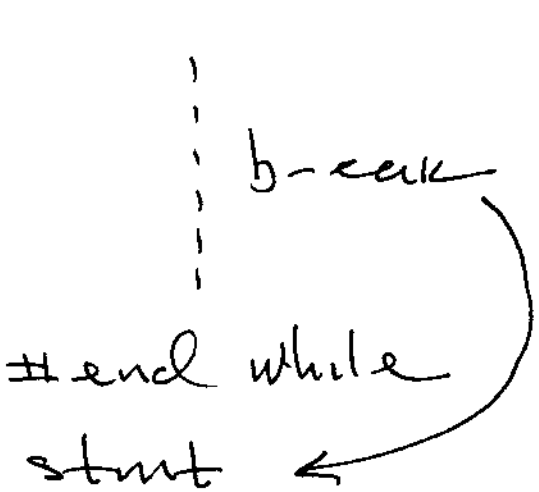
$S + S = (n+1) + (n+1) + (n+1) + \cdots + (n+1) + (n+1) + (n+1)$

$2S = n(n+1)$

$\therefore S = \frac{n(n+1)}{2}$

break statement:





continue statement:

```
for x in ..... :
    :
    :
    continue  --> goes to next
    :  ]          iteration, i.e.
    :             skips
#end for
                  i.e. ends current
                  iteration

while cond :
    :
    continue (skips, jumps)
    :  ]
#end while
```

Ex. Break1.py
Break2.py
Continue.py

Pass:

testing for Primality

isPrime(m, L) ← list of Primes [2, 3, 5, 7, ...]

biggest Prime in list must be $\leq \sqrt{m}$

say $L = [2, 3, 5]$

isPrime(m, [2, 3, 5])

works for m in range:

$2 \leq m \leq 25$

user enters # of Primes : n

start with L = [2]

m = 3

isPrime(m, L) → & True

L.append(m) → L = [2, 3]

m = 4

isPrime(m, L) → False

m = 5

isPrime(m, L) → True

L.append(m) → L = [2, 3, 5]

m = 6

m = 7

⋮

stop when len(L) == n .

L = [2]

m = 3 → T : [2, 3]

m = 4 → F : [2, 3]

m = 5 → T : [2, 3, 5]

m = 6 → F :

m = 7 → T : [2, 3, 5, 7]

m = 8 → F

m = 9 → F

m = 10 → F

m = 11 → T : [2, 3, 5, 7, 11]

m = 12

isPrime(m, L) required

$m \leq (\text{last Prime in } L)^2$

⋮

stop when len(L) is == n

collatz sequence (3n+1)

5, 16, 8, 4, 2, 1

26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

Conjecture: all collatz sequences end at 1.