

COL1000: Introduction to Programming

Nuts & Bolts of Python – Loops (and more loops)

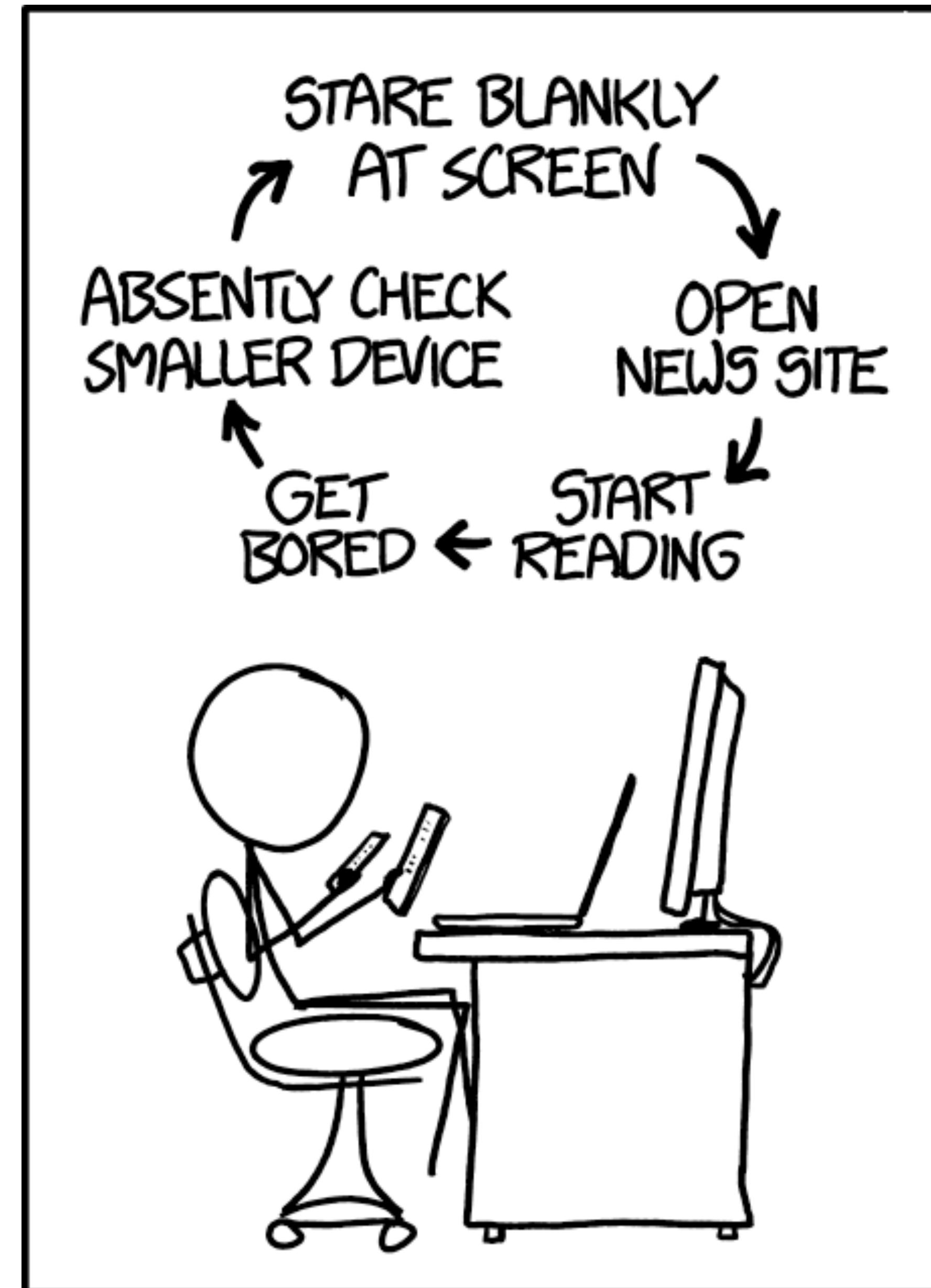
Subodh Sharma | Lec 6 | Aug 13



Reminders!

- Do NOT share passwords!
- Check <https://moodlenew.iitd.ac.in/> General-> Course Homepage -> Schedule
 - Under Lecture Code —> SVS find the `lec5.py` and play with it!
- **Help sessions in CSC lab from 5-6 pm on all working days! (Use only if you need it)**

LOOPS:



Loops: The necessity! (Recap)

```
num_x = int(input('How many times should I print the letter  
x? '))  
to_print = ''  
if num_x == 1:  
    to_print = 'x'  
elif num_x == 2:  
    to_print = 'xx'  
elif num_x == 3:  
    to_print = 'xxx'  
#...  
print(to_print)
```

- **The Trick:** If you want to accomplish the same thing many times, use iteration, a.k.a. loops!

```
num_x = int( input('How many times should I \\  
print the letter X?'))  
to_print = ''  
  
# Specification: concatenate X to to_print num_x times  
print(to_print)
```

Loops: While

- **Semantics:**
 - Iterate so long as the condition is true
 - Execute the body **sequentially**
 - Control returns back to condition evaluation
 - Exit the loop when condition becomes false
 - Perfect setting: when you don't know how many times you need to repeat something

Syntax

```
while (<C>):  
    <loop-body>  
    else: # optional
```

...

```
while(True):  
    print("...")
```

Don't do this!



Loops: While

- **Live coding** – begin with postcondition and walk back
- Postcondition:
 - $\text{len}(\text{to_print}) == \text{num_x}$
 - Where to assert this postcondition?
 - After the loop or before or within the loop?

```
num_x = int( input('How many times should I \
print the letter X?'))  
  
to_print = ''  
  
# Specification: concatenate X to to_print num_x times  
print(to_print)
```

Loops with Conditions: Program Development

- **Live coding** – begin with postcondition and walk back

```
"""
```

- For an input list of integers, print all the even entries

```
"""
```

```
strLst = input("Enter numbers separated by space:").split()
```