

COL1000: Introduction to Programming

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

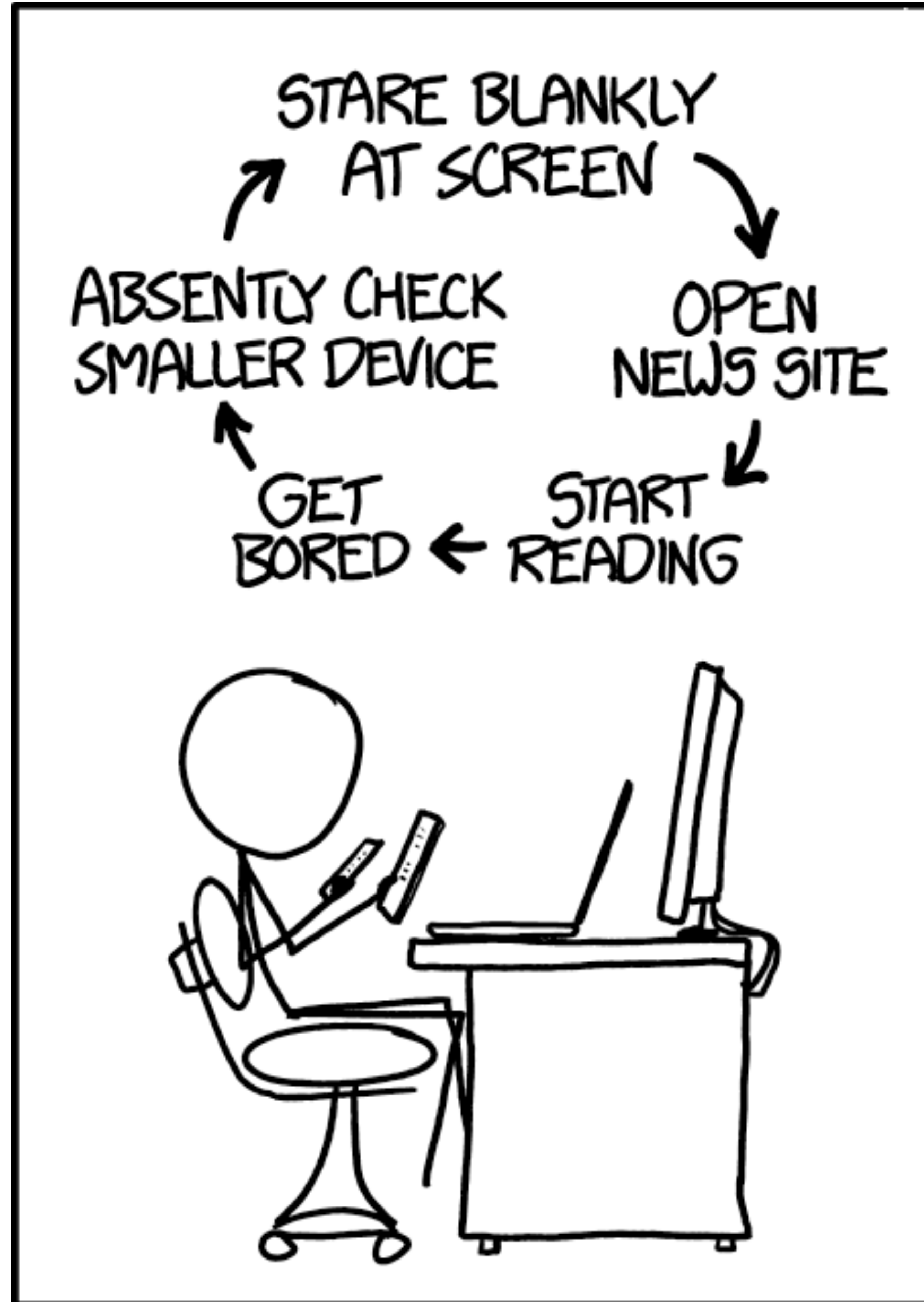
Subodh Sharma | Lec 6 | Aug 13



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:
 - `len(to_print) == 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()
```