SMIT SIKKIM MANIPAL UNIVERSITY

SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY

Engineering Mathematics III

Discrete Mathematics

Lecture 20

Free and Bound Variables

This course is taught to Computer Science Engineering students in SMIT, India during Jun-Dec, 2019.

for(i in Range(n)):

Bound variable to some thing. } → Scope

Print (i)

def isEven(x):

if (x%2 == 0):

Return Even

else:

Return odd.

( )

This

Free variable — Bound variable.

$\exists x$ such that $x \in A$

x - variable

Scope of x is the quantifier "$\exists$"

→ if ($x = 2$) print Yes.

$\forall x$, x is a student

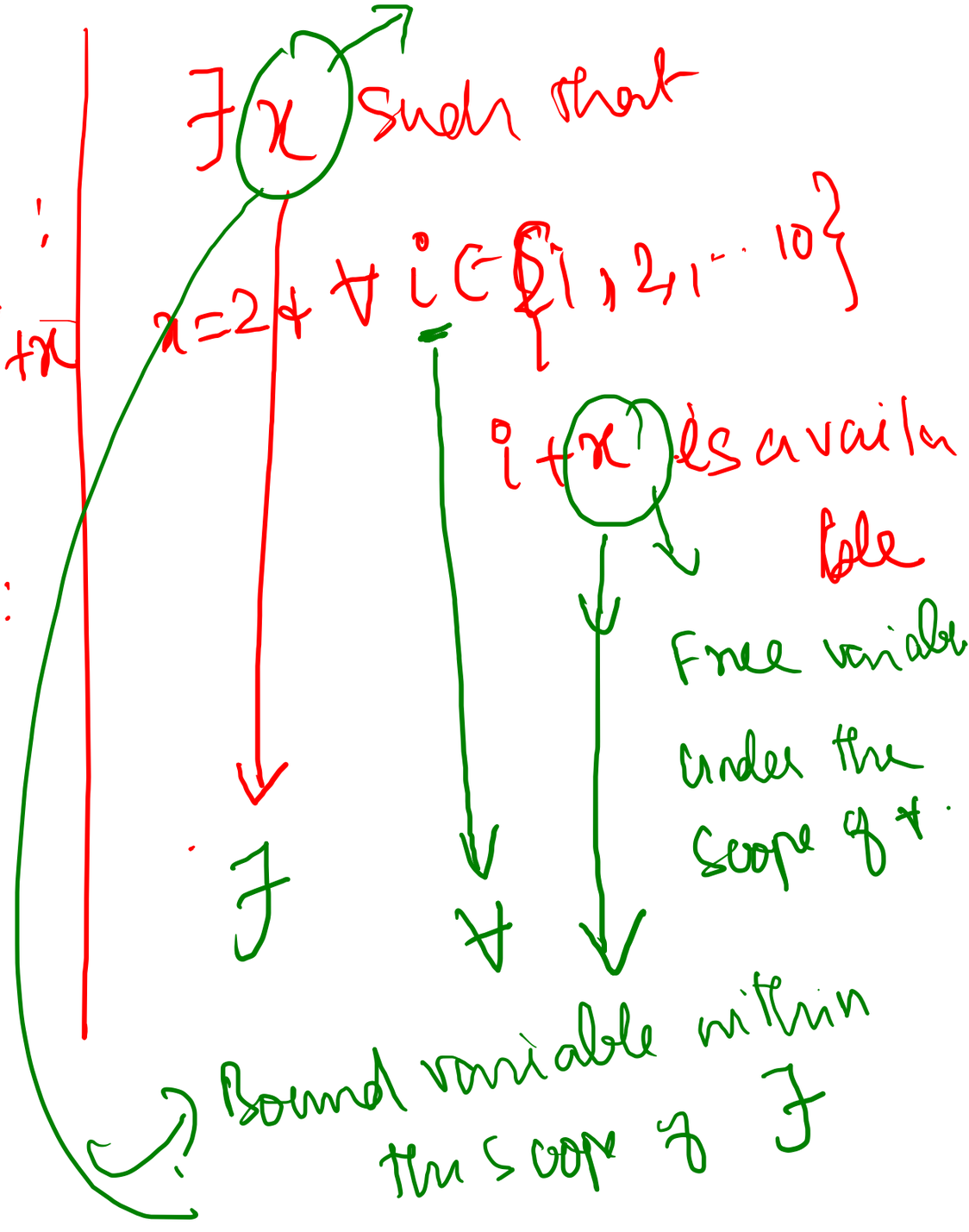
Scope of x is

the quantifies "$\forall$"

for (i in some) {

}

```
if (x = 2):
    for (i in range(10)):
        print i+x
elif (x = 1):
    for (i (in range 10)):
        print i^2
```



2 $M(x)$ $M(x)$: x is a writer

↓

scope of x is $M(x)$.

$\exists x , M(x) \wedge N(x)$

Scope of the quantifies $\exists$ = $M(x) \wedge N(x)$

$M(x) \wedge (\exists x , N(x))$

Scope of x is $M(x)$

scope of $\exists$ = $N(x)$

Scope of x = $N(x)$