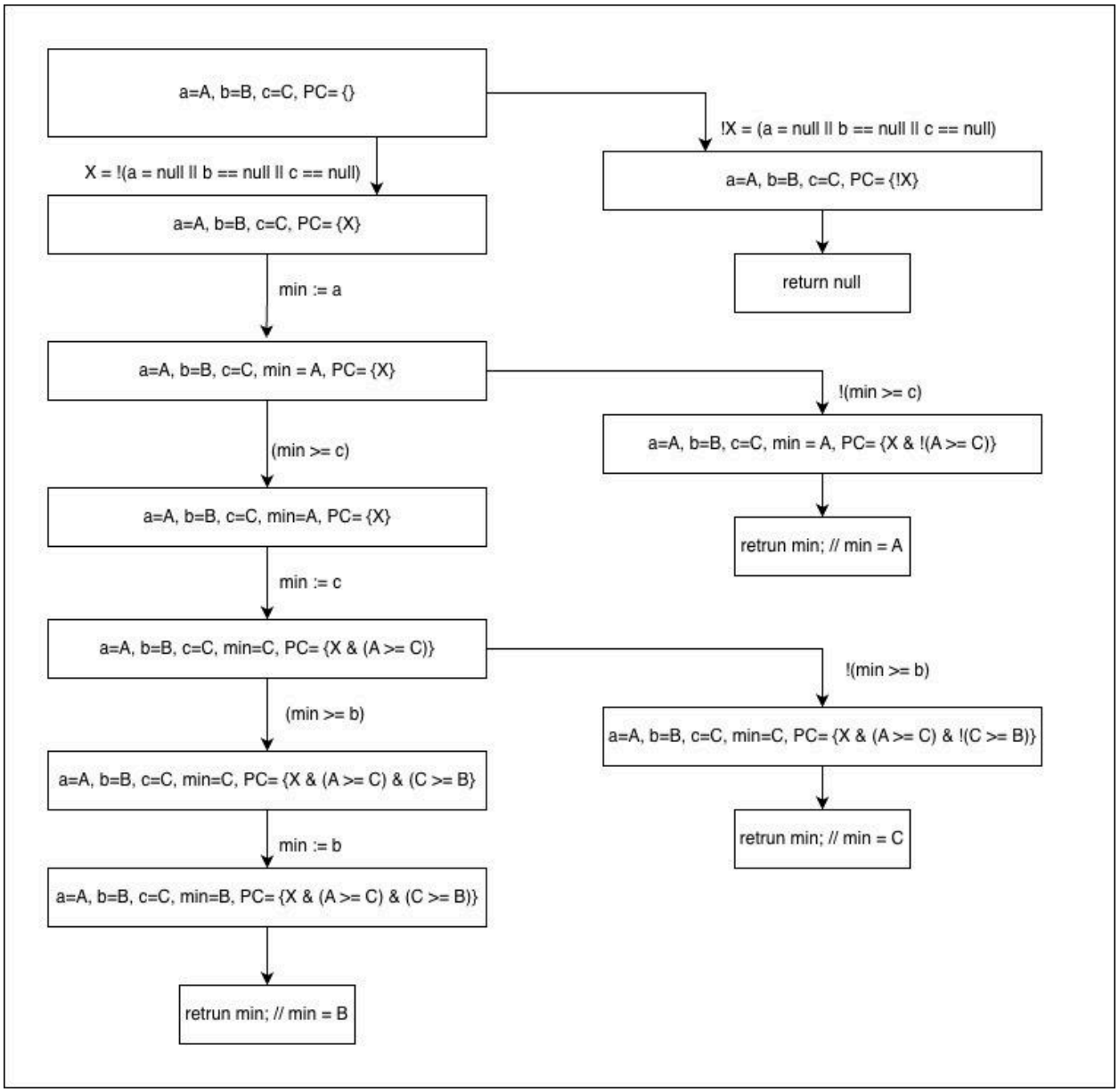
CIS613 - Assignment02 - Ahsan - W26

Symbolic Execution



Leaf Nodes:

1. a=A, b=B, c=C, PC= {!X}; !X = (a = null || b == null || c == null)
   Asserts input contains a null. Returns null.
2. a=A, b=B, c=C, min = A, PC= {X & !(A >= C)}
   Asserts all the inputs are non-null and A is less than C. Returns A.

3. a=A, b=B, c=C, min=C, PC= {X & (A >= C) & !(C >= B)}
   Asserts all the inputs are non-null and C is less than or equal to A and C is less than B. Returns C.
4. a=A, b=B, c=C, min=B, PC= {X & (A >= C) & (C >= B)}
   Asserts all the inputs are non-null and C is less than or equal to A and C is greater than or equal to B. Returns B.

Here, leaf node 2 contains a probable error as B is absent from this comparison.
If we consider a case where A is less than C, but B is the minimum, the code contains an error.

Incorrectness:

Let, A = 2, B = 1, C = 3
From path condition 2:

- Initialize min as 2
- Check if (2 >= 3) -> False.
- Return 2.

But the method should return 1 as the minimum for correctness.