SQL NULL LOGIC

Comparisons involving nulls are more of a problem. For example, consider the comparison "1<null". It would be wrong to say this is true since we do not know what the null value represents. Its unknown basically.

But it would likewise be wrong to claim this expression is false; if we did "not(1<null) would then be evaluate to true, which again does not make logical sense.

SQL therefore treats as unknown the result of any comparison involving a null value. This creates a third logical value in addition to true and false.

Null Values

It is possible for tuples to have a null value, denoted by null, for some of their attributes
null signifies an unknown value or that a value does not exist.
The result of any arithmetic expression involving null is null
Example: 5 + null returns null
The predicate is null can be used to check for null values.
Example: Find all instructors whose salary is null.

```
select name
from instructor
where salary is null
```

Any comparison with null returns unknown
Returning false could cause problems:
Consider r.A < 10 vs. not (r.A >= 10)

Null Values and Three Valued Logic:

Any comparison with null returns unknown
Example: 5 < null or null <> null or null = null
Three-valued logic using the truth value unknown:
OR: (unknown or true) = true,
(unknown or false) = unknown
(unknown or unknown) = unknown
AND: (true and unknown) = unknown,
(false and unknown) = false,
(unknown and unknown) = unknown
NOT: (not unknown) = unknown
“P is unknown” evaluates to true if predicate P evaluates to unknown
Result of where clause predicate is treated as false if it evaluates to unknown.

Courtesy:
Chapter 3: Introduction to SQL
Database System Concepts, 6Ed
By, Silberschatz, Korth and Sudarshan.