

**COMP 410**  
**Fall 2024**

**Unification in Prolog**

For each of the unification attempts below, state:

- Whether or not the unification succeeds
- If the unification succeeds, state the values of each variable

1.)  $1 = 1$

2.)  $1 = 2$

3.)  $x = 27$

4.)  $1 = x$

5.)  $x = \text{foo}$

6.)  $\text{foo} = \text{bar}$

7.)  $1 = \text{baz}$

8.)  $\text{foo}(1) = \text{foo}(1)$

9.)  $\text{foo}(1) = \text{foo}(2)$

10.)  $\text{foo}(X) = \text{foo}(1)$

11.)  $\text{foo}(1) = \text{foo}(X)$

12.)  $\text{foo}(1) = \text{foo}(1, 2)$

13.)  $\text{foo}(X, Y) = \text{foo}(1)$

14.)  $\text{foo}(X, Y) = \text{foo}(1, 2)$

15.)  $\text{foo}(1, Y) = \text{foo}(X, 2)$

16.)  $\text{foo}(1, 2) = \text{foo}(X, X)$

17.)  $\text{foo}(\text{bar}(X), Y) = \text{foo}(Z, \text{bar})$

18.)  $\text{foo}(\text{bar}(X), \text{foo}(Y)) = \text{foo}(\text{foo}(1), \text{foo}(2))$

19.)  $\text{foo}(\text{bar}(X), \text{foo}(2)) = \text{foo}(\text{bar}(3), \text{foo}(Y))$

20.)  $\text{foo}(\text{bar}(X), X) = \text{foo}(Y, 2)$

21.)  $\text{foo}(1, \text{foo}(2, \text{foo}(3, \text{bar}))) = \text{foo}(1, \text{foo}(2, \text{foo}(\text{bar})))$