

page 615/11  $R = \{ (x, y) \mid x, y \text{ are bitstrings of length } \geq 3 \text{ that agree in their first three bits} \}$

$S$  - set of all bit-strings of length 3 or more

- $R$  is reflexive, because  $(x, x) \in R$ , i.e. the bitstring agrees with itself in all bits!
- $R$  is symmetric, because if  $(x, y) \in R$  it means that strings  $x$  and  $y$  agree in their first 3 bits. we can easily re-phrase it to: strings  $y$  and  $x$  agree in their first 3 bits, which gives us  $(y, x) \in R$
- $R$  is transitive, because if strings  $x$  and  $y$  agree in their first 3 bits, and strings  $y$  and  $z$  agree in their first 3 bits, then obviously strings  $x$  and  $z$  agree in their first 3 bits.

Therefore relation  $R$  on  $S$  is an equivalence relation