

Foundations of Software Science (ソフトウェア基礎科学) /

Foundations of Computer Software (ソフトウェア基礎)

Preliminary Quiz (Anonymous)

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Answer "true" or "false" for each of the following logical formulas. Here, \mathbb{N} is the set of all non-negative integers (including zero), \forall means "all", \exists means "exists", \Rightarrow "implies (if ... then ...)", \wedge "and", \vee "(inclusive) or", and \neg means "not". The precedence of logical symbols is \neg , \wedge , \vee , \Rightarrow , \forall and \exists in this order (left is higher, right is lower).

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|---|-------|
| 1. $\exists x \in \mathbb{N}. (x > 1) \wedge (x < 2)$ | False |
| 2. $\forall x \in \mathbb{N}. \neg(x > 1) \vee \neg(x < 2)$ | True |
| 3. $\forall x \in \mathbb{N}. \exists y \in \mathbb{N}. x < y$ | True |
| 4. $\exists y \in \mathbb{N}. \forall x \in \mathbb{N}. x < y$ | False |
| 5. $\exists y \in \mathbb{N}. \forall x \in \mathbb{N}. x \geq y$ | True |
| 6. $\forall x \in \mathbb{N}. \exists y \in \mathbb{N}. x > y$ | False |
| 7. $\forall x \in \mathbb{N}. \exists y \in \mathbb{N}. (x \neq 0) \Rightarrow (x > y)$ | True |
| 8. $\exists y \in \mathbb{N}. \forall x \in \mathbb{N}. (x \neq 0) \Rightarrow (x > y)$ | True |
| 9. $\neg \exists x \in \mathbb{N}. \forall y \in \mathbb{N}. x > y$ | True |
| 10. $\forall x \in \mathbb{N}. \neg \forall y \in \mathbb{N}. x \leq y$ | False |

Answer also the following questions with "Yes" or "No".

- Would you be able to (more or less) understand the class if it is conducted in Japanese?
- Is your laboratory (more or less) related to mathematical logic or theoretical computer science?