FUNCTORS

Definition: **Functor** is an expression (neither a sentence, nor a term), which combines other expressions (its arguments) into a complex expression.

Examples (underlined expressions are functors):

John loves Mary.

Venice is an exceptional city.

In order to provide a given functor with a full description it is necessary to give three pieces of information:

1. category of expression created by combining functor with its arguments (What is formed?) – sentence-forming, term-forming, functor-forming
2. syntactical categories of arguments (Out of what is formed?) – of sentences, of terms, of functors, of term and sentence etc.
3. number of arguments (How many arguments?) – 1, 2, 3, …

Above information can be encoded as a fraction (K. Ajdukiewicz's categorical grammar). Information 1) is encoded in numerator, information 2) and 3) in denominator.

Examples:

$\frac{s}{s}$ – sentence-forming functor out of one sentence

$\frac{s}{tt}$ – sentence-forming functor out of two terms

$\frac{t}{t}$ – term-forming functor out of one term

$\frac{\frac{t}{t}}{\frac{t}{t}}$ – functor-forming functor out of one functor

It is not true that John loves Mary. $\frac{s}{s}$

John loves Mary. $\frac{s}{tt}$

John loves Mary, but Mary doesn't love John. $\frac{s}{ss}$

high castle $\frac{t}{t}$

very dark knight $\frac{\frac{t}{t}}{\frac{t}{t}}$

TYPES OF FUNCTORS

According to its role in expression:

1. **main functor** - functor F is the main functor of expression E iff expression E can be decomposed without a reminder into F and expressions A_1, …, A_n, which are arguments of F
2. **functor, which is not main**

Examples (underlined functors are main functors of the following expressions):

It is not true that John loves Mary.
John loves Mary.
John loves Mary, but Mary doesn't love John.
high castle
very dark knight

REMARK! Given functor can be a main functor of one expression and not main functor of some other expression.

Regarding the truth conditions of a sentence, sentence-forming functors can be divided into:

1. **extensional functors** – the main functor of a sentence S such that the truth value of S depends only on the truth value of its component sentences, and not on its meanings
2. **intensional functors** - functors which are not extensional

Examples:

Sun is a star and Earth is a star.
„and" is an extensional functor

John believes, that Kate is the most beautiful girl in the World.
„believes, that" is an intensional functor