



Assignment of master's thesis

Title:	Math expression evaluator for literal types in TypeScript
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Study program:	Informatics
Branch / specialization:	Web Engineering
Department:	Department of Software Engineering
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Instructions

Template literal types [1], introduced in TypeScript 4.1, expand on string literal types for narrowing down a type to a particular string constant, with the ability to expand into many string literal types.

1. Analyze and describe relevant constructs of the TypeScript type system (concatenation, recursive types, conditional types etc.)
2. Implement a typesafe math expression evaluator with a set of basic operations, using a string literal type both as the input and output of the evaluator.
3. Pick appropriate tools for testing type annotations and ensure the validity of the evaluator with functional tests.
4. Discuss the practical uses of implemented meta types and theoretical and practical shortcomings of the TypeScript type system.
5. Publish the implementation as an open-source TypeScript library, which can be used for meta-programming, including source code and corresponding documentation.

[1] <https://www.typescriptlang.org/docs/handbook/2/template-literal-types.html>