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Subject Area	Software and Systems

Supporting Swift 4 Generics in Tifig

```
private_tifig - GenericSubscripts/Sources/Subscripts/main.swift - Tifig
main.swift 12
1
2 protocol TwoDimensionalCollection {
3     associatedtype NestedCollection where Element.Element == Element
4     associatedtype Element
5 }
6
7 class Matrix<T>: TwoDimensionalCollection {
8     typealias NestedCollection = Array<Array<T>>
9     typealias Element = T
10    private var content: NestedCollection {
11        init(_ content: NestedCollection) {
12            self.content = content
13        }
14        subscript(_ index1: Int, _ index2: Int) -> T {
15            return content[index1][index2]
16        }
17    }
18
19    let matrix1 = Matrix([[1,2,3],[4,5,6],[7,8,9]])
20    print(matrix1[1,2])
21
22    let matrix2 = Matrix([[["a"],["b"],["c"],["d"]]])
23    print(matrix2[3,0])
24
```

Using associated types and subscripts in Tifig

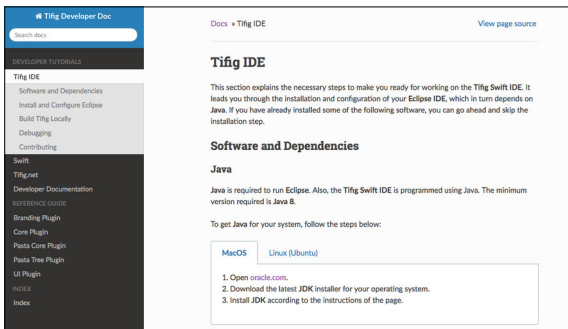
Introduction: Tifig is a Swift IDE based on Eclipse. Since Swift has been open sourced, a compiler for Linux systems became part of the Swift project, allowing the development of Swift applications on platforms other than macOS. Because Xcode is only available on macOS, Tifig aims to be the preferred alternative. With its newest release, many language features and syntax changes were introduced to Swift. This resulted in inconsistencies between the behaviour of the Swift compiler and Tifig. The aim of this thesis was to improve the existing Tifig IDE by:

- Supporting the new enhancements in Swift's generics system.
- Consolidating the existing documentation in a form that promotes continual development.

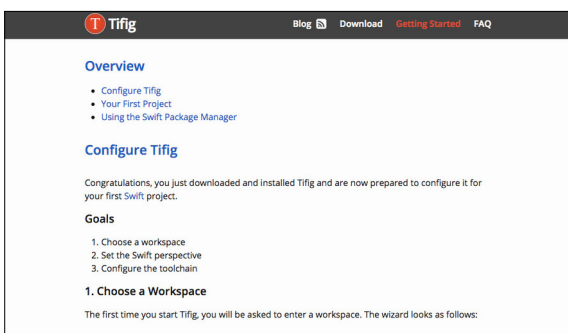
Procedure / Result: To achieve this, Tifig's parser and indexer were extended to support the newly introduced syntax and to ensure correct indexing order and index correctness. Tifig's type checker was modified to enable correct type resolution. To improve the current documentation, a study of multiple large and successful open source projects was conducted.

Result: The results of this thesis encompass:

- The newest alpha release of Tifig
- An extensive documentation for Tifig contributors
- Introductory tutorials for first-time Tifig users
- A short theoretical study on how to improve the performance and resolve current issues of the Swift type checker



Developer documentation including an automatically generated reference guide



Getting started section on www.tifig.net providing tutorials for first-time users