Data-driven low-code programming system

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Intro

Low-code programming systems provide a graphical user interface (GUI), through which users can create software elements. Software development using low-code programming systems is increasingly popular and traditional low-code development systems that provide user interface creation functionality primarily provide the *UI-to-data* approach, where developers create user interface elements before populating them with data. However, the data-to-UI approach, where the development process begins with concrete data that drives the creation of corresponding UI elements, remains unexplored as a primary development method. We present the InterfaceSmith prototype programming system, which implements *data-to-UI* as the primary development method for creating web applications' UI elements. The system aims to aid developers in modifying the interface through context menus and generates applications following the Elm architecture. Our evaluation through benchmarks, including a TO-DO list application and tasks from the 7GUIs benchmark suite, demonstrates the system's effectiveness in reducing the amount of code developers need to write while maintaining the ability to implement custom web application functionality.

Motivation

The primary motivation for this research is to allow the creation of single-page web applications following the Elm architecture, also known as Model-View-Update, based on concrete data uploaded to the system. The aim is to allow incremental creation of UI elements based on the uploaded data's type and structure.

Goals

1. Explore the
2. Create a working **prototype programming system** implementing the data-driven approach.
3. Benchmark the prototype application on the following tasks:
   - A simple **TO-DO list** application inspired by the *TodoMVC* becnhmark.
   - **Counter** task from the *7GUIs* becnhmark.
   - **Temperature converter** task from the *7GUIs* becnhmark.

Solution approach

Experiments

Summary

Supervisor

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Repository

https://github.com/JerrySvarc/InterfaceSmith

Thesis

https://jerrysvarc.github.io/bachelor-thesis/thesis.pdf