

Creating a visual programming language

Mid-evaluation project report

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CS 306 Programming Languages

1 Problem Description

Our aim in this project is to make a visual programming language like Scratch. You can go as deep as you want, however, ensure that you are able to add some of the major functionalities in your programming language.

1.1 Learning objectives

The things that we are gaining from this undertaking are:

1. Semantic checking and analysis
2. Processing visual data to complete a particular atomic operation
3. Understanding the control flow of a program using visual components

2 Solution outline

The deliverables from this project are:

1. Python code which simulates a basic visual programming language
2. Algorithm for processing components

2.1 Flow of the program

We are implementing a basic visual programming language using Python. In Python, to develop the GUI part, we used a module called "PyQt5". This module helps us in creating an application in a separate application window. This module also helps us in implementing events and event listeners.

We are dividing the main canvas window into three portions:

1. **List of blocks:** This is the area where the user will be able to see a list of all available blocks that the user can use.

2. **Main area:** This is the main canvas where the user can arrange the blocks in any specific order, to simulate a basic program.
3. **Output console:** This is the portion where the user can visualize their output asset or text.

2.2 Code

The functionality that has been implemented till now can be found on our [GitHub repository](#).

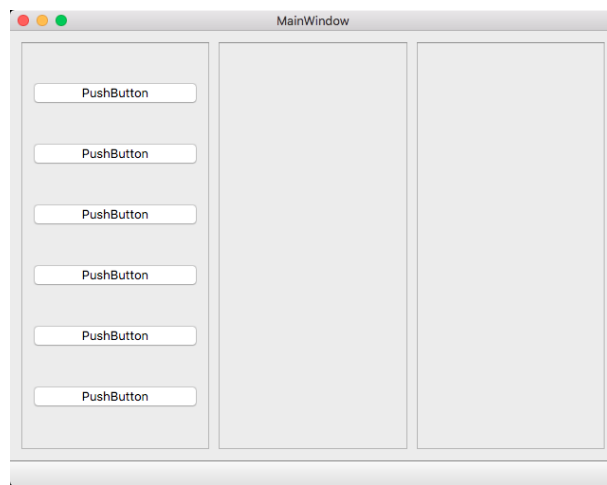


Figure 1: Initial state

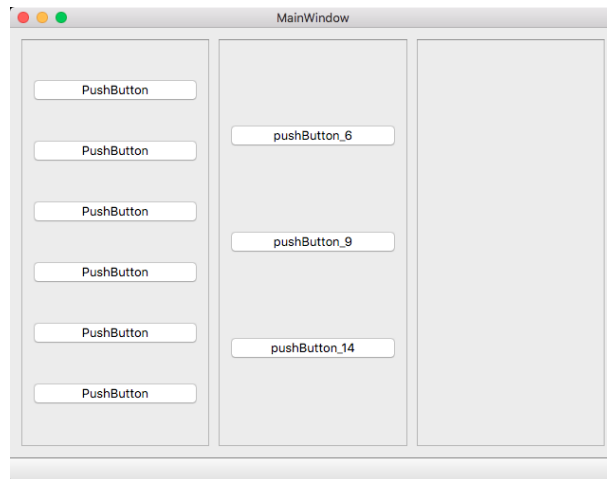


Figure 2: State after clicking the input buttons

3 References

The references mainly consist of YouTube tutorials and guides for implementing features like adding buttons, generating layouts, creating event listeners, etc.

1. <https://www.youtube.com/watch?v=Vde5SH8e1OQ>
2. <https://www.youtube.com/watch?v=tlhFIAymKnQ>