Homework 3

Software Engineering Principle

Software Engineering Program,

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School of Engineering, KMITL

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Features

Gantt Chart

Used for planning project plan and tasks duration or deadline.

Class Diagram

Used for designing classes in the projects.

Interaction Diagram

Used for designing how classes interact each others in the projects.

Markdown Renderer for the task assignment page

How it works:

- As mentioned earlier, we can use markdown to express the task, $\therefore$ we need a markdown renderer.

Implementation Approach:

- Use QEngineWebView Module in PyQt.

VS-Code Extension (OPTIONAL)

`TODO` extension in VS-Code with better description for the task and with team member(s) assigned to that task.
How it works:

- If you have comment with `TODO` in the front, you can add description of the task in a different entry and also in a markdown file.
- If you want to add a person in charge for that task (OPTIONAL), you can use `@TEMP`, where `TEMP` can be either role or team member names.
- After saved, you can access the `TODO` description as you hover and click to inspect task in the comment.

Implementation Approach:

- Scan through the file looking for comment with `TODO` in the front then keep the entry into the DB.
- We can edit the `TODO` description inside a external markdown file.

Page included in this homework

- **Task Assignment Page**: Page to edit `TODO` for task assignments with markdown supported for better view. User can choose whether to edit in the manual mode or external text editor and save file because it can also fetch from real `.md` files in the real program.

Code:

TaskAssignmentPageCode.py

```python
import sys
from PySide6.QtWidgets import *
from PySide6.QtCore import *
from PySide6.QtWebEngineWidgets import *
import markdown as md

from TaskAssignmentPageUI import Ui_Form

class TaskAssignmentPage(QWidget):
    def __init__(self) -> None:
        QWidget.__init__(self, None)
        self.ui = Ui_Form()
        self.ui.setupUi(self)
        self.sync_preview = QWebEngineView()
        self.manual_preview = QWebEngineView()
        self.ui.web_engine_hbox.addWidget(self.sync_preview,1)
        self.ui.preview_vbox_manual.addWidget(self.manual_preview,
        ↪  1)
        self.current_mode_text = "Manual"
        self.text = "Type Here..."
        self.ui.editor.setPlaceholderText(self.text)
        self.ui.toggle_btn.clicked.connect(self.toggle_mode)
        self.ui.manual_convert_btn.clicked.connect(self.convert)
        self.ui.sync_convert_btn.clicked.connect(self.convert)
        self.ui.current_mode_label.setText(f"Mode:
        ↪  {self.current_mode_text}")
        self.ui.manual_save_btn.clicked.connect(self.save)
        self.ui.sync_save_btn.clicked.connect(self.save)
        self.ui.manual_load_btn.clicked.connect(self.load)
        self.ui.sync_load_btn.clicked.connect(self.load)

    def toggle_mode(self) -> None:
        if self.current_mode_text == "Sync":
            self.current_mode_text = "Manual"
            self.ui.mode_tab.setCurrentIndex(0)
            self.ui.current_mode_label.setText(f"Mode:
            ↪  {self.current_mode_text}")
        else:
            self.current_mode_text = "Sync"
            self.ui.mode_tab.setCurrentIndex(1)
            self.ui.current_mode_label.setText(f"Mode:
               ↪  {self.current_mode_text}")

    def convert(self) -> None:
        self.text = self.ui.editor.toPlainText()
        self.sync_preview.setHtml(md.markdown(self.text))
        self.manual_preview.setHtml(md.markdown(self.text))


    def load(self) -> None:
        file_path, _ = QFileDialog.getOpenFileName(self,
            "Select a Markdown File",
            "",
            "Markdown Files (*.md)"
        )
        print(file_path)
        if not file_path:
            return None
        try:
            with open(file_path, "r+") as file:
                self.text = file.read()
                print(self.text)
                self.ui.editor.setPlainText(self.text)
        except Exception as e:
            d = QDialog(None)
            vbox = QVBoxLayout()
            label = QLabel()
            label.setText(str(e))
            vbox.addWidget(label)
            d.setLayout(vbox)


    def save(self) -> None:
        file_path, _ = QFileDialog.getSaveFileName(self,
                "Select a Markdown File",
                "",
                "Markdown Files (*.md)"
            )
```

```python
        if not file_path:
            return None
        try:
            with open(file_path, "w+") as file:
                file.write(self.text)
        except Exception as e:
            d = QDialog(None)
            vbox = QVBoxLayout()
            label = QLabel()
            label.setText(str(e))
            vbox.addWidget(label)
            d.setLayout(vbox)


def main() -> None:
    app = QApplication(sys.argv)
    w = TaskAssignmentPage()
    w.show()
    sys.exit(app.exec())

if __name__ == "__main__":
    main()
```

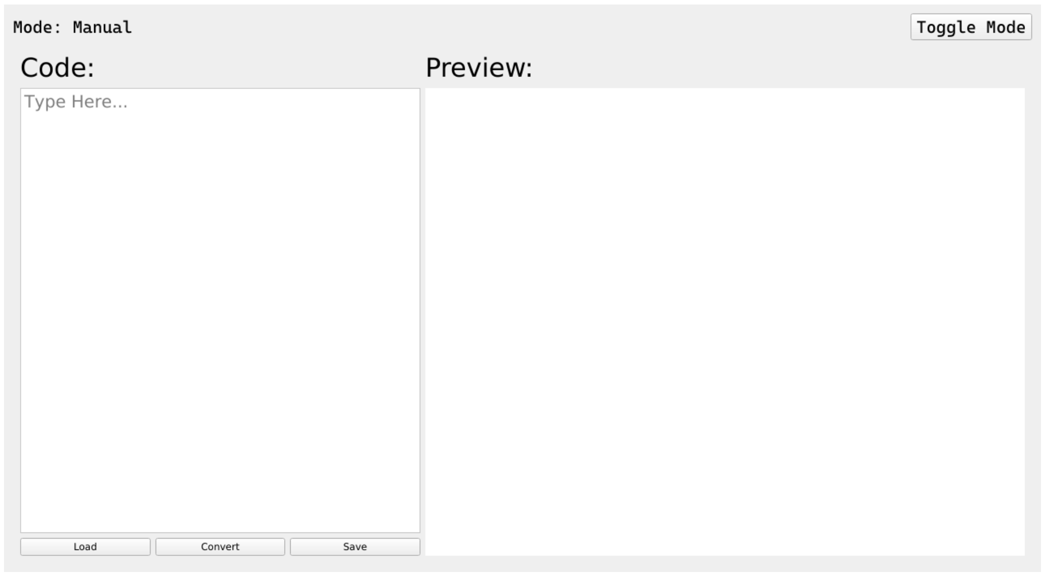
TaskAssignmentPageUI.py

```
# -*- coding: utf-8 -*-

##################################################################
  ↪  ##############
## Form generated from reading UI file 'TaskAssignmentPage.ui'
##
## Created by: Qt User Interface Compiler version 6.10.1
##
## WARNING! All changes made in this file will be lost when
  ↪  recompiling UI file!
##################################################################
  ↪  ##############

from PySide6.QtCore import (QCoreApplication, QDate, QDateTime,
  ↪  QLocale,
    QMetaObject, QObject, QPoint, QRect,
    QSize, QTime, QUrl, Qt)
from PySide6.QtGui import (QBrush, QColor, QConicalGradient,
  ↪  QCursor,
    QFont, QFontDatabase, QGradient, QIcon,
    QImage, QKeySequence, QLinearGradient, QPainter,
    QPalette, QPixmap, QRadialGradient, QTransform)
from PySide6.QtWidgets import (QApplication, QHBoxLayout, QLabel,
  ↪  QPushButton,
    QSizePolicy, QStackedWidget, QTextEdit, QVBoxLayout,
    QWidget)

class Ui_Form(object):
    def setupUi(self, Form):
        if not Form.objectName():
            Form.setObjectName(u"Form")
        Form.resize(1280, 700)
        Form.setMinimumSize(QSize(0, 0))
        self.verticalLayout = QVBoxLayout(Form)
        self.verticalLayout.setObjectName(u"verticalLayout")
        self.navbar_hbox = QHBoxLayout()
        self.navbar_hbox.setObjectName(u"navbar_hbox")
        self.current_mode_label = QLabel(Form)
        self.current_mode_label.setObjectName(u"current_mode_label⌋
            ↪  ")
        font = QFont()
        font.setFamilies([u"CaskaydiaCove Nerd Font"])
        font.setPointSize(16)
        self.current_mode_label.setFont(font)

        self.navbar_hbox.addWidget(self.current_mode_label)

        self.toggle_btn = QPushButton(Form)
        self.toggle_btn.setObjectName(u"toggle_btn")
        sizePolicy = QSizePolicy(QSizePolicy.Policy.Fixed,
           ↪  QSizePolicy.Policy.Fixed)
        sizePolicy.setHorizontalStretch(0)
        sizePolicy.setVerticalStretch(0)
        sizePolicy.setHeightForWidth(self.toggle_btn.sizePolicy().⌋
           ↪  hasHeightForWidth())
        self.toggle_btn.setSizePolicy(sizePolicy)
        self.toggle_btn.setMinimumSize(QSize(0, 0))
        self.toggle_btn.setFont(font)

        self.navbar_hbox.addWidget(self.toggle_btn)


        self.verticalLayout.addLayout(self.navbar_hbox)

        self.mode_tab = QStackedWidget(Form)
        self.mode_tab.setObjectName(u"mode_tab")
        self.manual_mode_tab = QWidget()
        self.manual_mode_tab.setObjectName(u"manual_mode_tab")
        self.horizontalLayout = QHBoxLayout(self.manual_mode_tab)
        self.horizontalLayout.setObjectName(u"horizontalLayout")
        self.editor_vbox = QVBoxLayout()
        self.editor_vbox.setObjectName(u"editor_vbox")
        self.code_label = QLabel(self.manual_mode_tab)
        self.code_label.setObjectName(u"code_label")
        font1 = QFont()
        font1.setPointSize(24)
        self.code_label.setFont(font1)

        self.editor_vbox.addWidget(self.code_label)
        self.editor = QTextEdit(self.manual_mode_tab)
        self.editor.setObjectName(u"editor")
        font2 = QFont()
        font2.setPointSize(16)
        font2.setKerning(False)
        self.editor.setFont(font2)
        self.editor.setStyleSheet(u"background-color: #ffffff;")

        self.editor_vbox.addWidget(self.editor)

        self.manual_btn_hbox = QHBoxLayout()
        self.manual_btn_hbox.setObjectName(u"manual_btn_hbox")
        self.manual_load_btn = QPushButton(self.manual_mode_tab)
        self.manual_load_btn.setObjectName(u"manual_load_btn")

        self.manual_btn_hbox.addWidget(self.manual_load_btn)

        self.manual_convert_btn = QPushButton(self.manual_mode_tab)
        self.manual_convert_btn.setObjectName(u"manual_convert_btn
          ↪  ")

        self.manual_btn_hbox.addWidget(self.manual_convert_btn)

        self.manual_save_btn = QPushButton(self.manual_mode_tab)
        self.manual_save_btn.setObjectName(u"manual_save_btn")

        self.manual_btn_hbox.addWidget(self.manual_save_btn)


        self.editor_vbox.addLayout(self.manual_btn_hbox)

        self.editor_vbox.setStretch(1, 1)

        self.horizontalLayout.addLayout(self.editor_vbox)

        self.preview_vbox_manual = QVBoxLayout()
        self.preview_vbox_manual.setObjectName(u"preview_vbox_manu
          ↪  al")
        self.preview_label_maual = QLabel(self.manual_mode_tab)
        self.preview_label_maual.setObjectName(u"preview_label_mau⌋
           ↪  al")
        self.preview_label_maual.setFont(font1)

        self.preview_vbox_manual.addWidget(self.preview_label_maua⌋
           ↪  l)


        self.horizontalLayout.addLayout(self.preview_vbox_manual)

        self.horizontalLayout.setStretch(0, 2)
        self.horizontalLayout.setStretch(1, 3)
        self.mode_tab.addWidget(self.manual_mode_tab)
        self.sync_mode_tab = QWidget()
        self.sync_mode_tab.setObjectName(u"sync_mode_tab")
        self.horizontalLayout_4 = QHBoxLayout(self.sync_mode_tab)
        self.horizontalLayout_4.setObjectName(u"horizontalLayout_4⌋
           ↪  ")
        self.preview_vbox_sync = QVBoxLayout()
        self.preview_vbox_sync.setObjectName(u"preview_vbox_sync")
        self.preview_label_sync = QLabel(self.sync_mode_tab)
        self.preview_label_sync.setObjectName(u"preview_label_sync⌋
           ↪  ")
        self.preview_label_sync.setFont(font1)

        self.preview_vbox_sync.addWidget(self.preview_label_sync)

        self.web_engine_hbox = QHBoxLayout()
        self.web_engine_hbox.setObjectName(u"web_engine_hbox")

        self.preview_vbox_sync.addLayout(self.web_engine_hbox)

        self.sync_btn_hbox = QHBoxLayout()
        self.sync_btn_hbox.setObjectName(u"sync_btn_hbox")
        self.sync_load_btn = QPushButton(self.sync_mode_tab)
        self.sync_load_btn.setObjectName(u"sync_load_btn")

        self.sync_btn_hbox.addWidget(self.sync_load_btn)

        self.sync_convert_btn = QPushButton(self.sync_mode_tab)
        self.sync_convert_btn.setObjectName(u"sync_convert_btn")
```

```
        self.sync_btn_hbox.addWidget(self.sync_convert_btn)

        self.sync_save_btn = QPushButton(self.sync_mode_tab)
        self.sync_save_btn.setObjectName(u"synv_save_btn")

        self.sync_btn_hbox.addWidget(self.sync_save_btn)


        self.preview_vbox_sync.addLayout(self.sync_btn_hbox)

        self.preview_vbox_sync.setStretch(1, 1)

        self.horizontalLayout_4.addLayout(self.preview_vbox_sync)

        self.mode_tab.addWidget(self.sync_mode_tab)

        self.verticalLayout.addWidget(self.mode_tab)


        self.retranslateUi(Form)

        self.mode_tab.setCurrentIndex(0)


        QMetaObject.connectSlotsByName(Form)
    # setupUi

    def retranslateUi(self, Form):
        Form.setWindowTitle(QCoreApplication.translate("Form",
         ↪  u"Form", None))
        self.current_mode_label.setText(QCoreApplication.translate⌋
         ↪  ("Form", u"Current Mode:", None))
        self.toggle_btn.setText(QCoreApplication.translate("Form",
         ↪  u"Toggle Mode", None))
        self.code_label.setText(QCoreApplication.translate("Form",
         ↪  u"Code:", None))
        self.editor.setPlaceholderText("")
        self.manual_load_btn.setText(QCoreApplication.translate("F⌋
         ↪  orm", u"Load", None))
        self.manual_convert_btn.setText(QCoreApplication.translate␣
            ↪  ("Form", u"Convert", None))
        self.manual_save_btn.setText(QCoreApplication.translate("F␣
            ↪  orm", u"Save", None))
        self.preview_label_maual.setText(QCoreApplication.translat␣
            ↪  e("Form", u"Preview:", None))
        self.preview_label_sync.setText(QCoreApplication.translate␣
            ↪  ("Form", u"Preview:", None))
        self.sync_load_btn.setText(QCoreApplication.translate("For␣
            ↪  m", u"Load", None))
        self.sync_convert_btn.setText(QCoreApplication.translate("␣
            ↪  Form", u"Convert", None))
        self.sync_save_btn.setText(QCoreApplication.translate("For␣
            ↪  m", u"Save", None))
    # retranslateUi
```

Output:

Task Assignment Page



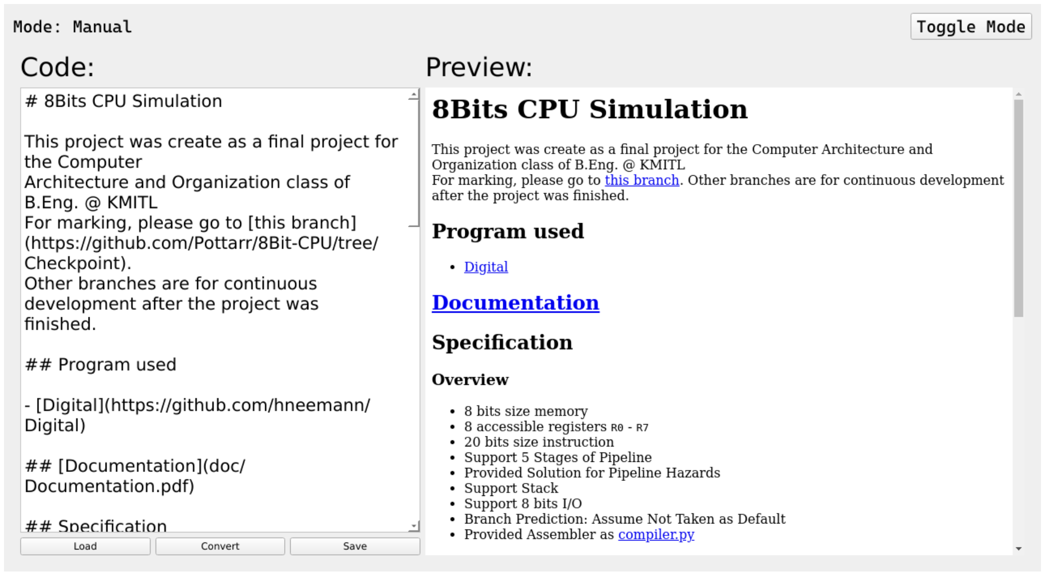
```
Mode: Manual                                   Toggle Mode
```

Code:

Type Here...

Load Convert Save

Preview:



```
Mode: Manual                                   Toggle Mode
```

Code:

```
# 8Bits CPU Simulation

This project was create as a final project for
the Computer
Architecture and Organization class of
B.Eng. @ KMITL
For marking, please go to [this branch]
(https://github.com/Pottarr/8Bit-CPU/tree/
Checkpoint).
Other branches are for continuous
development after the project was
finished.

## Program used

- [Digital](https://github.com/hneemann/
Digital)

## [Documentation](doc/
Documentation.pdf)

## Specification
```

Load Convert Save

Preview:

8Bits CPU Simulation

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Program used

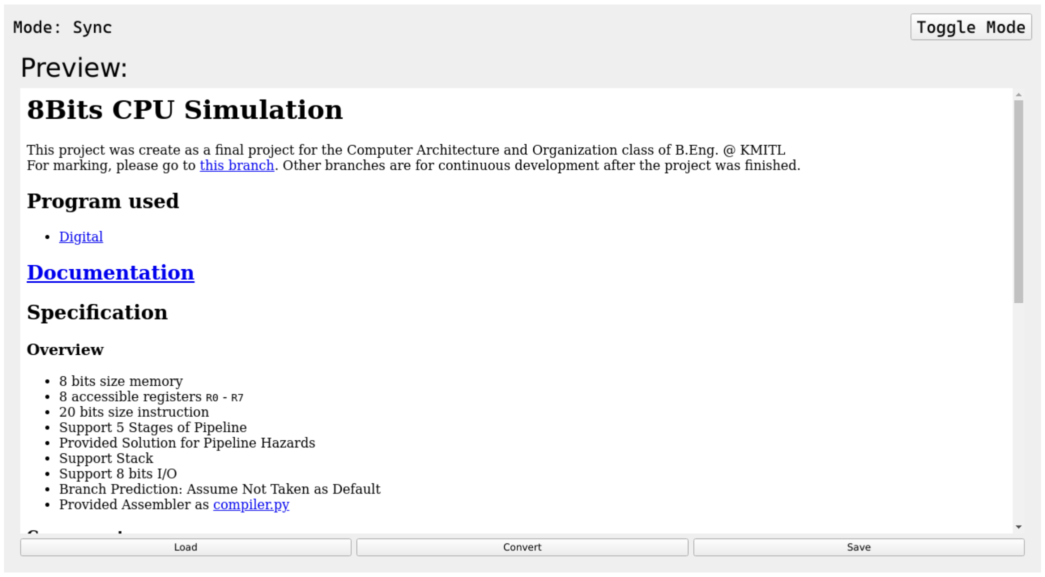
- Digital

Documentation

Specification

Overview

- 8 bits size memory
- 8 accessible registers `R0` - `R7`
- 20 bits size instruction
- Support 5 Stages of Pipeline
- Provided Solution for Pipeline Hazards
- Support Stack
- Support 8 bits I/O
- Branch Prediction: Assume Not Taken as Default
- Provided Assembler as compiler.py



Mode: Sync

Toggle Mode

Preview:

8Bits CPU Simulation

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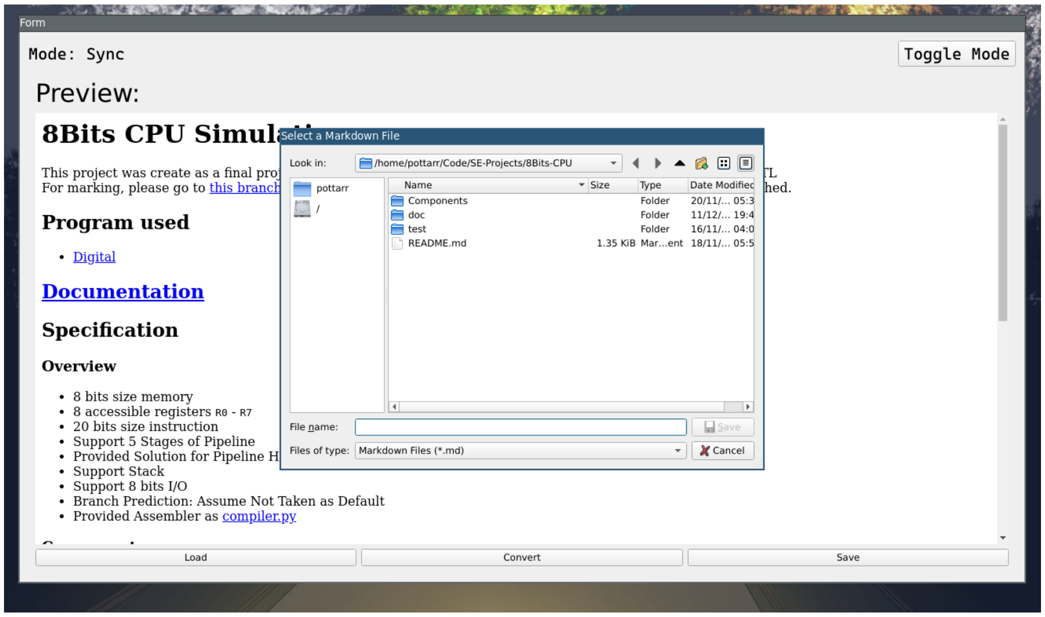

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Select a Markdown File

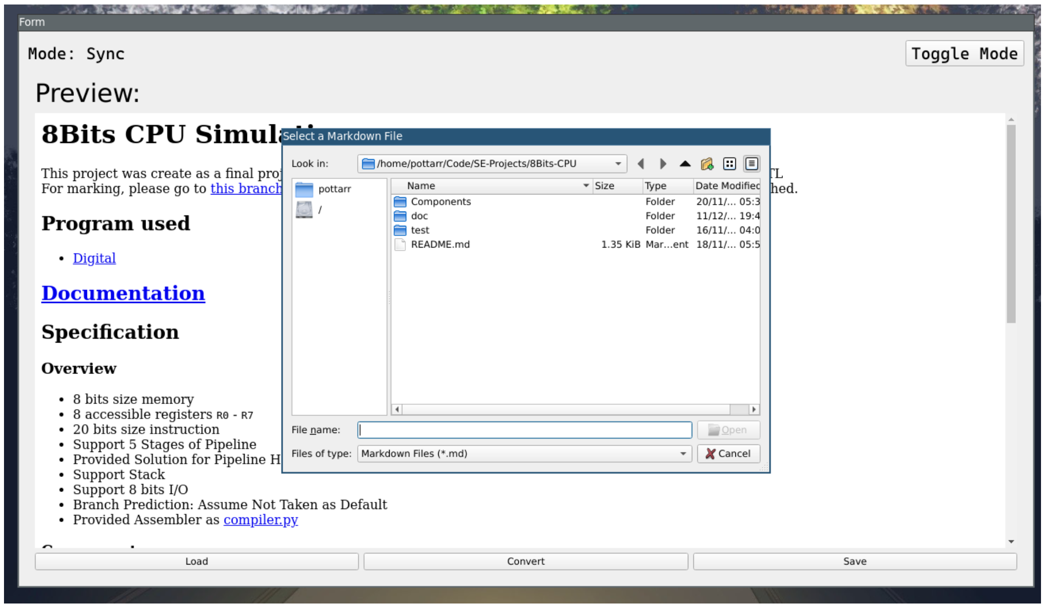
Look in: /home/pottarr/Code/SE-Projects/8Bits-CPU

pottarr
/

Name	Size	Type	Date Modified
Components		Folder	20/11/... 05:3
doc		Folder	11/12/... 19:4
test		Folder	16/11/... 04:0
README.md	1.35 KiB	Mar...ent	18/11/... 05:5

File name:

Files of type: Markdown Files (*.md)



Name	Size	Type	Date Modified
Components		Folder	20/11/... 05:3
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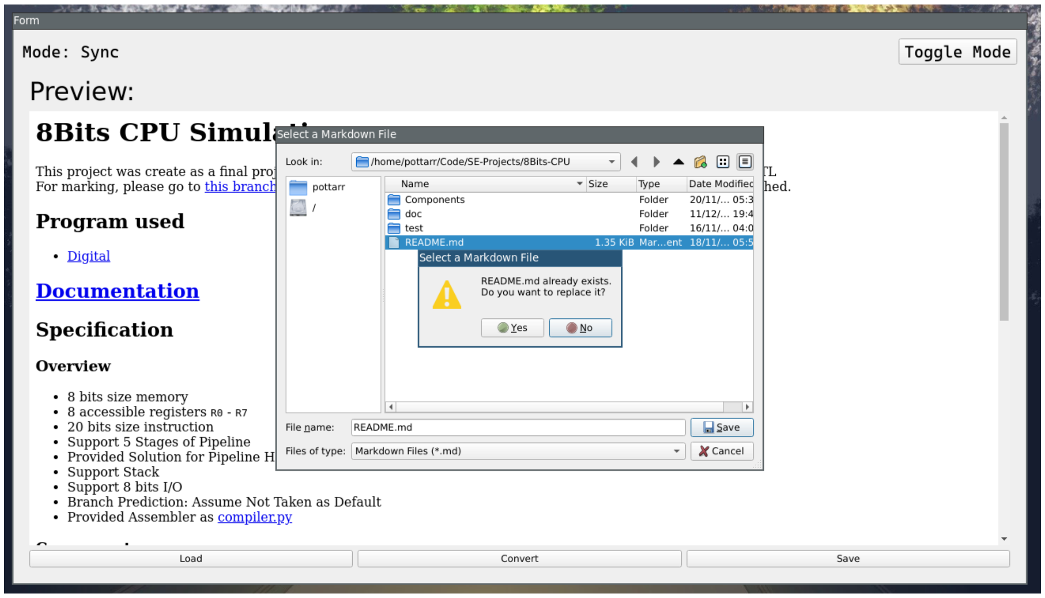

Name	Size	Type	Date Modified
Components		Folder	20/11/... 05:3
doc		Folder	11/12/... 19:4
test		Folder	16/11/... 04:0
README.md	1.35 KiB	Mar...ent	18/11/... 05:5

README.md already exists.
Do you want to replace it?

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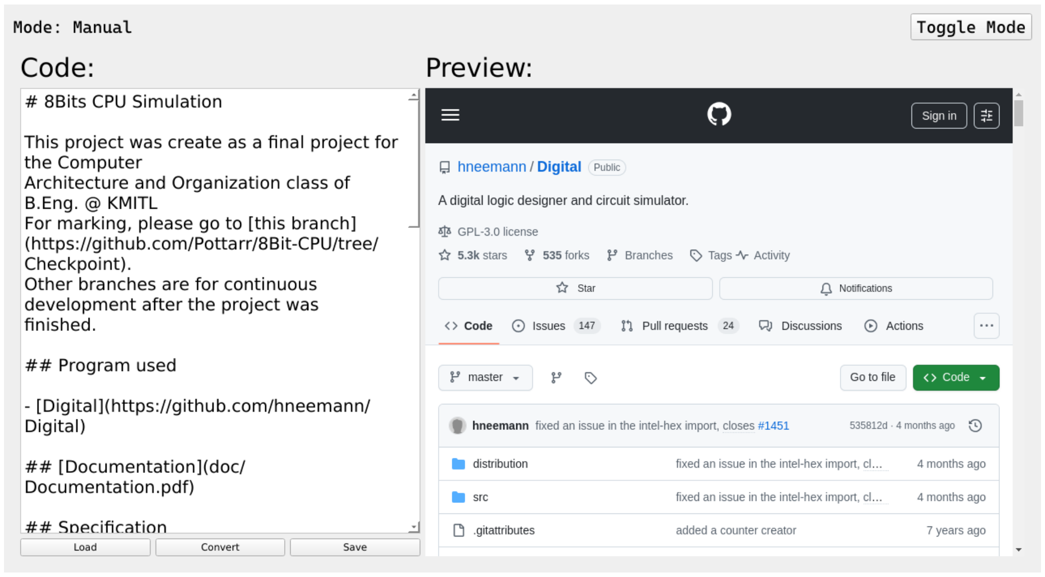

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hneemann / Digital Public

A digital logic designer and circuit simulator.

GPL-3.0 license
5.3k stars 535 forks Branches Tags Activity

hneemann	fixed an issue in the intel-hex import, closes #1451	535812d · 4 months ago
distribution	fixed an issue in the intel-hex import, cl...	4 months ago
src	fixed an issue in the intel-hex import, cl...	4 months ago
.gitattributes	added a counter creator	7 years ago

External Plugin

- `pip install markdown`