Homework 2

Software Engineering Principle

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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

```
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)"
            )
```

```
        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)
```

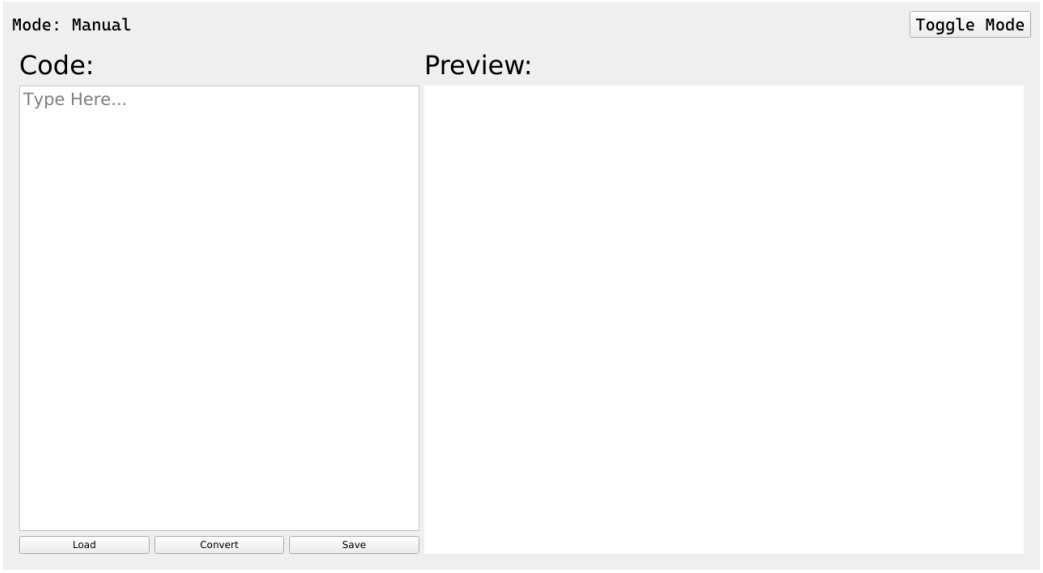
```
self.preview_label_maual.setObjectName(u"preview_label_mau
  ↪  al")
self.preview_label_maual.setFont(font1)

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")
```

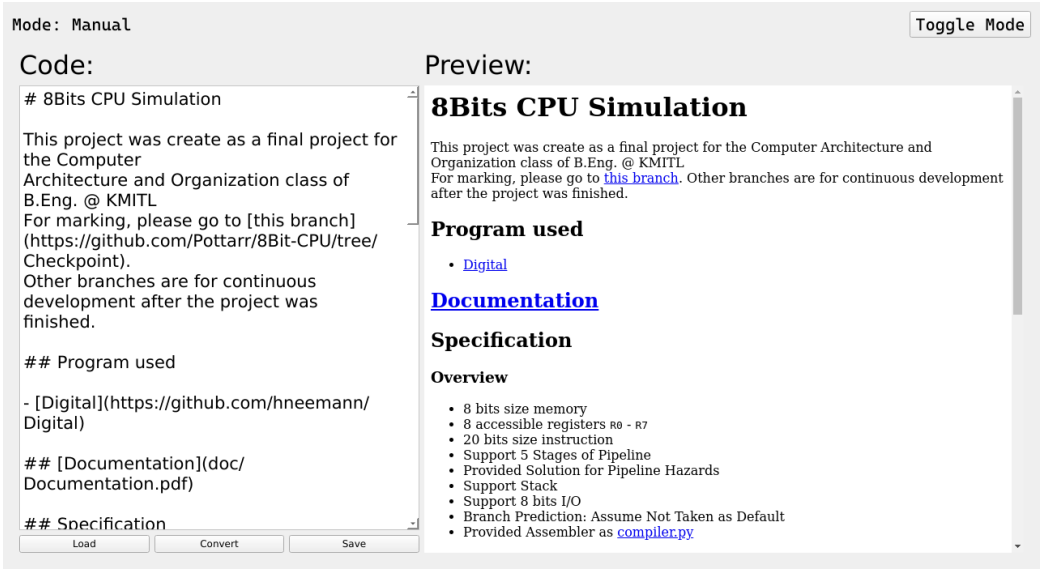
```
        self.sync_btn_hbox.addWidget(self.sync_convert_btn)

        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
```

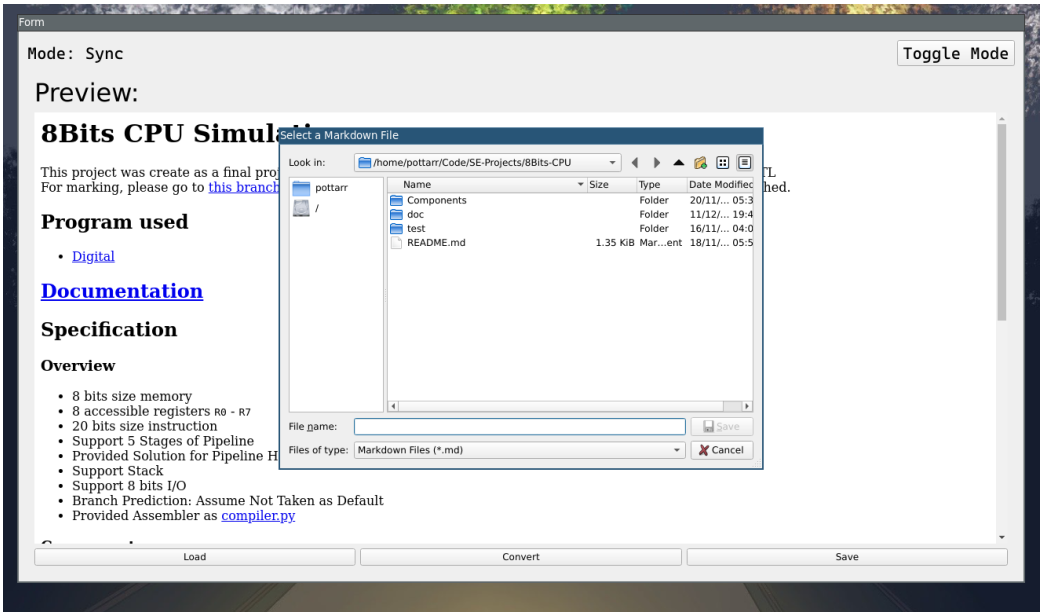
Output:

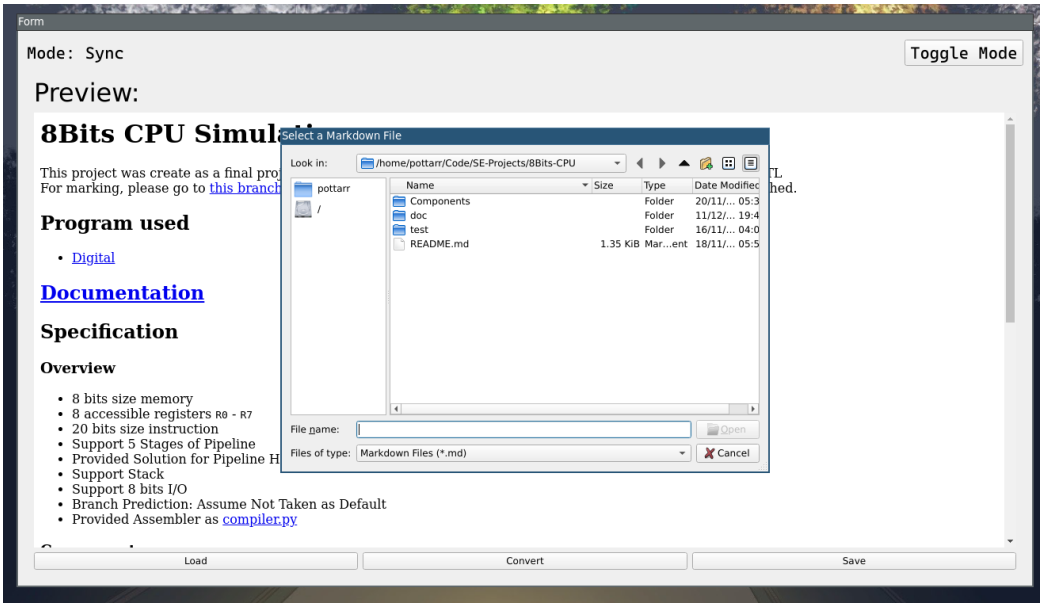
Task Assignment Page

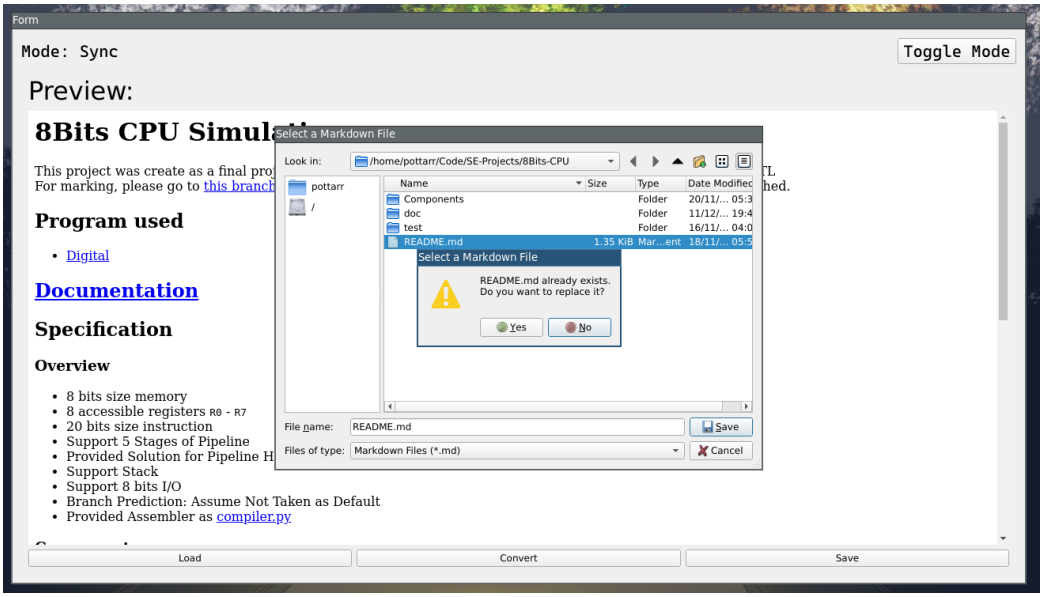


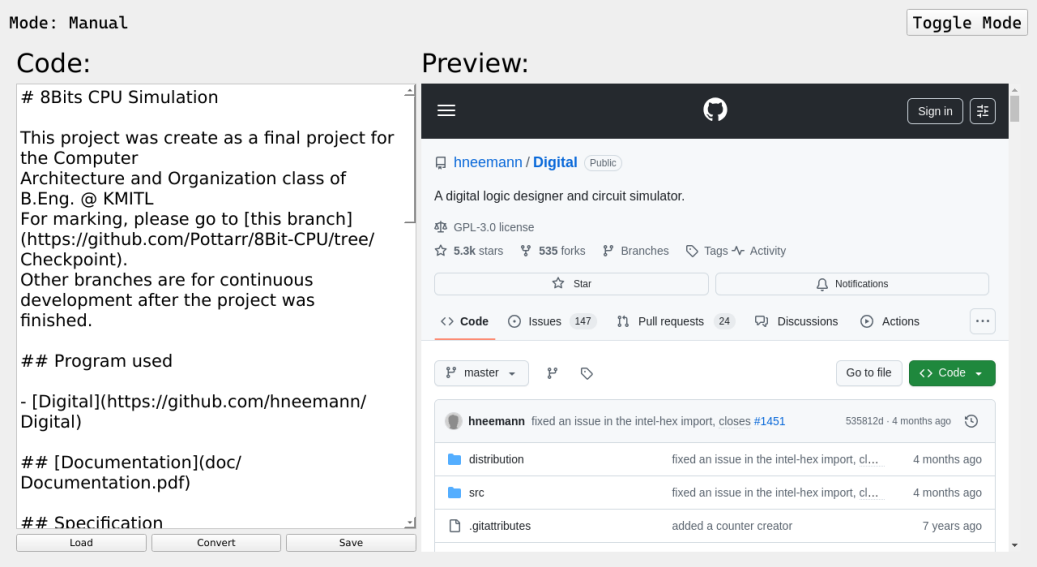



Mode: Sync
Toggle Mode
Preview:
8Bits CPU Simulation
This project was create as a final project for the Computer Architecture and Organization class of B.Eng. @ KMITL
For marking, please go to this branch. Other branches are for continuous development after the project was finished.
Program used
Digital
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
Load
Convert
Save


Form
Mode: Sync
Toggle Mode
Preview:
Select a Markdown File
Look in:
/home/pottarr/Code/SE-Projects/8Bits-CPU
pottarr
/
Name
Size
Type
Components
Folder
doc
Folder
test
Folder
README.md
1.35 KiB
File name:
Files of type:
Markdown Files (*.md)
Save
Cancel
Load
Convert
Save


Form
Mode: Sync
Toggle Mode
Preview:
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:
Open
Files of type: Markdown Files (*.md)
Cancel
Program used
Digital
Documentation
Specification
Overview
8 bits size memory
8 accessible registers R0 - R7
20 bits size instruction
Support 5 Stages of Pipeline
Support Stack
Support 8 bits I/O
Branch Prediction: Assume Not Taken as Default
Provided Assembler as compiler.py
Load
Convert
Save


Form
Mode: Sync
Toggle Mode
Preview:
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
Select a Markdown File
README.md already exists.
Do you want to replace it?
Yes
No
File name: README.md
Save
Files of type: Markdown Files (*.md)
Cancel
Program used
Digital
Documentation
Specification
Overview
8 bits size memory
8 accessible registers R0 - R7
20 bits size instruction
Support 5 Stages of Pipeline
Support Stack
Support 8 bits I/O
Branch Prediction: Assume Not Taken as Default
Provided Assembler as compiler.py
Load
Convert
Save



External Plugin

- `pip install markdown`