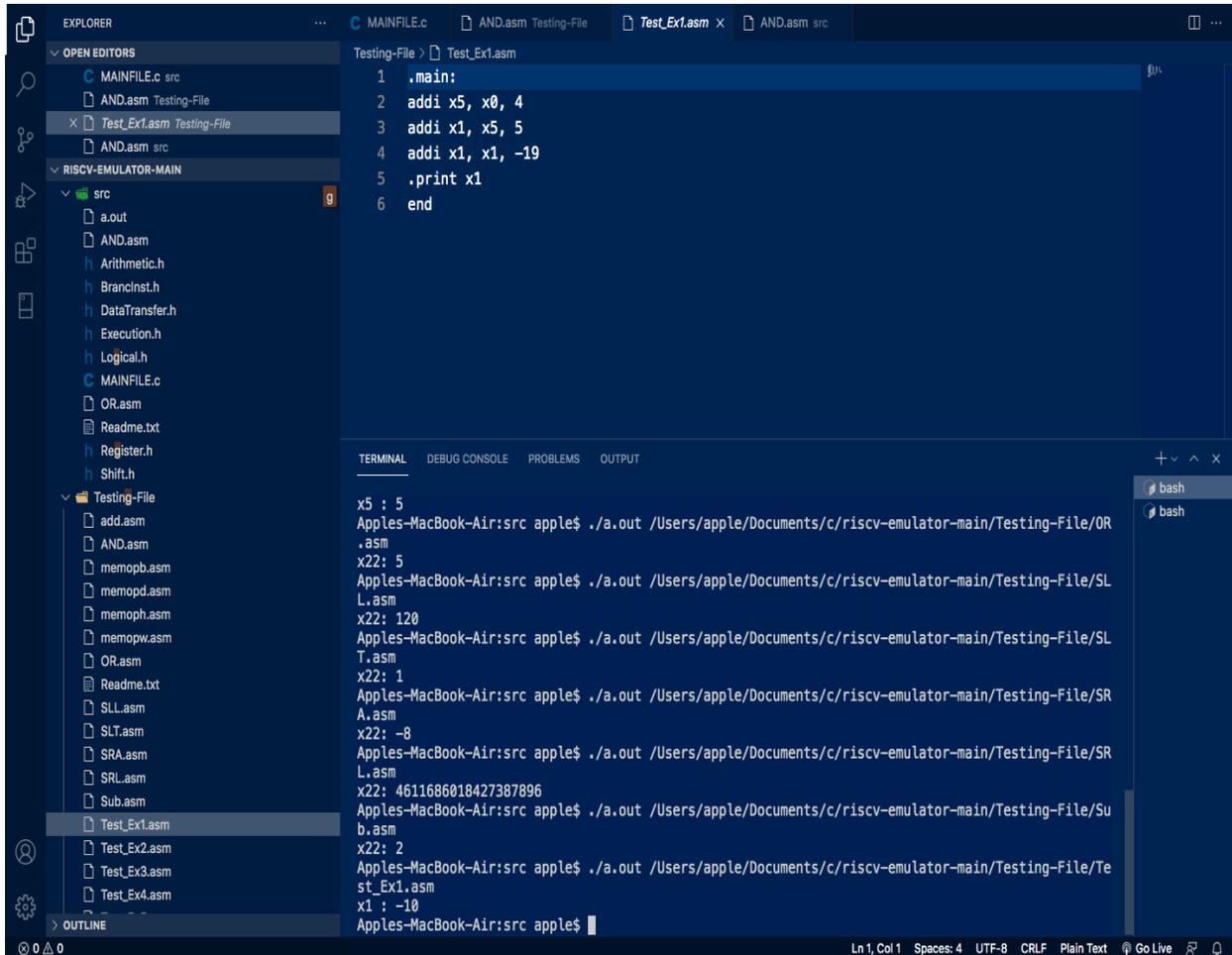


Program 1

This is a program of Addition operation run on the Designed Interpreter:-



The screenshot shows a code editor with the following assembly code in `Test_Ex1.asm`:

```
1 .main:
2 addi x5, x0, 4
3 addi x1, x5, 5
4 addi x1, x1, -19
5 .print x1
6 end
```

The terminal output shows the execution of the program:

```
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR
.asm
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
L.asm
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SR
A.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SR
L.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Su
b.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$
```

Program 2

This is a program of Subtraction operation run on the Designed Interpreter:-

```
1 .main:
2     addi x20, x0, 5
3     addi x21, x0, 3
4     sub x22, x20, x21
5     .print x22
6     end
```

```
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopw.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR.asm
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL.L.asm
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL.T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRA.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRL.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Sub.asm
x22: 2
Apples-MacBook-Air:src apple$
```

Program 3

This is a program of AND operation run on the Designed Interpreter:-

The image shows a code editor window with the following content:

```
src > AND.asm
1  .main:
2      addi x20, x0, 5
3      addi x21, x0, 3
4      and x21, x20, x21
5      .print x21
6  end
```

The terminal output shows the execution of the program:

```
Apples-MacBook-Air:src apple$ ./a.out AND.asm
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm
x22: 500
Apples-MacBook-Air:src apple$ ./a.out Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm;[]
```

Program 4

This is a program of OR operation run on the Designed Interpreter:-

The image shows a code editor with the following content:

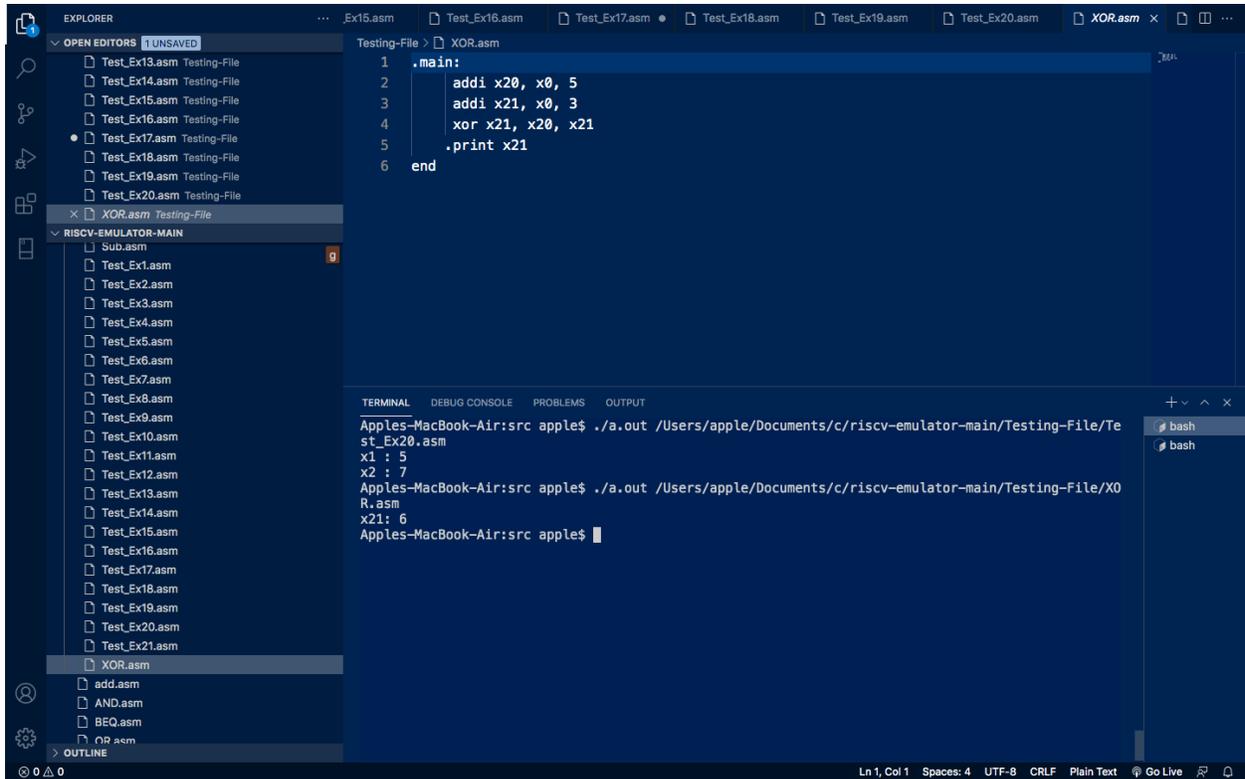
```
1 .main:
2     addi x20, x0, 4
3     addi x21, x0, 1
4     or x22, x20, x21
5     .print x22
6     end
```

The terminal output shows the execution of the program:

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.d.asm;
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/and.d.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopd.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memoph.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopw.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR.asm;
x22: 5
Apples-MacBook-Air:src apple$
```

Program 5

This is a program of XOR operation run on the Designed Interpreter:-



Program 6

This is a program of Store Byte and Load Byte operation run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1 .main:
2     addi x20, x0, 5
3     addi x21, x0, 5
4     sb x21, 6(x20)
5     lb x5, 6(x20)
6     .print x5
7 end
```

The terminal output shows the execution of the program with the following commands and results:

```
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.d.asm
x22: 500
Apples-MacBook-Air:src apple$ ./a.out Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.d.asm;
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.d.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$
```

Program 7

This is a program of Store Double and Load Double operation run on the Designed Interpreter:-

The image shows a screenshot of an IDE with the following components:

- EXPLORER:** Shows a project structure with folders like 'OPEN EDITORS', 'RISCV-EMULATOR-MAIN', and 'Testing-File'. The file 'memopd.asm' is selected in the 'Testing-File' folder.
- Editor:** Displays the assembly code for 'memopd.asm':

```
1 .main:
2     addi x20, x0, 5
3     addi x21, x0, 5
4     sd x21, 6(x20)
5     ld x5, 6(x20)
6     .print x5
7 end
```
- TERMINAL:** Shows the execution output:

```
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/ad
d.asm
x22: 500
Apples-MacBook-Air:src apple$ ./a.out Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/ad
d.asm;
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/an
d.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/me
mopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/me
mopd.asm
x5 : 5
Apples-MacBook-Air:src apple$
```

Program 8

This is a program of Store Half and Load Half operation run on the Designed Interpreter:-

```
1 .main:
2     addi x20, x0, 5
3     addi x21, x0, 5
4     sh x21, 6(x20)
5     lh x5, 6(x20)
6     .print x5
7     end
```

```
x22: 500
Apples-MacBook-Air:src apple$ ./a.out Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm;
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopd.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memoph.asm;
x5 : 5
Apples-MacBook-Air:src apple$
```

Program 9

This is a program of Store Word and Load Word operation run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1 .main:
2   addi x20, x0, 5
3   addi x21, x0, 5
4   sw x21, 6(x20)
5   lw x5, 6(x20)
6   .print x5
7   end
```

The terminal output shows the following commands and results:

```
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out ./Testing-File/add.asm
Could not read file!!!
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm;
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/add.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopd.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/moph.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopw.asm;
x5 : 5
Apples-MacBook-Air:src apple$
```

Program 10

This is a program of Logical Shift Left operation run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1 .main:
2     addi x20, x0, 30
3     addi x21, x0, 2
4     sll x22, x20, x21
5     .print x22
6     end
```

The terminal output shows the execution of several assembly programs, with the final output being:

```
x22: 500
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/and.asm;
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopd.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/memopw.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR.asm;
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SLT.asm;
x22: 120
Apples-MacBook-Air:src apple$
```

Program 11

This is a program of Set Less Than operation run on the Designed Interpreter:-

The image shows a code editor window with a dark theme. The Explorer sidebar on the left shows a project structure with folders like 'RISCV-EMULATOR-MAIN' and 'Testing-File'. The main editor displays the assembly code for 'SLT.asm':

```
1 .main:
2   addi x20, x0, 2
3   addi x21, x0, 5
4   slt x22, x20, x21
5   .print x22
6   end
```

Below the code is a terminal window showing the execution of the program. The terminal output is as follows:

```
x21: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopb.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopd.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/moph.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopw.asm;
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR.asm;
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SLL.asm;
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SLT.asm;
x22: 1
Apples-MacBook-Air:src apple$
```

Program 12

This is a program of Arithmetic Shift Right operation run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1 .main:
2   addi x20, x0, -30
3   addi x21, x0, 2
4   sra x22, x20, x21
5   .print x22
6   end
```

The terminal output shows the execution of the program with the following results:

```
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/me
mopd.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/me
moph.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/me
mopw.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR
.asm
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
L.asm
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SR
A.asm
x22: -8
Apples-MacBook-Air:src apple$
```

Program 13

This is a program of Logical Shift Left operation run on the Designed Interpreter:-

The image shows a code editor window with a dark theme. The Explorer sidebar on the left shows a project structure with folders like 'OPEN EDITORS', 'RISCV-EMULATOR-MAIN', and 'Testing-File'. The main editor area displays the assembly code for 'SRL.asm':

```
1 .main:
2   addi x20, x0, -30
3   addi x21, x0, 2
4   srl x22, x20, x21
5   .print x22
6   end
```

Below the code is a terminal window showing the execution of the program. The terminal output is as follows:

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopw.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/mopw.asm
x5 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/OR.asm
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL.L.asm
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL.T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRA.A.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRL.L.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$
```

Program 14

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
Testing-File > Test_Ex2.asm
1  .main:
2  addi x5, x0, 0
3  ori x1, x5, 1
4  sub x5, x0, x1
5  .print x5
6  end
```

The terminal output shows the execution of the program:

```
x22: 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
L.asm
x22: 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SL
T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SR
A.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SR
L.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Su
b.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$
```

Program 15

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
EXPLORER
  OPEN EDITORS
    MAINFILE.c src
    AND.asm Testing-File
    Test_Ex3.asm Testing-File
    AND.asm src
  RISCY-EMULATOR-MAIN
    src
      a.out
      AND.asm
      Arithmetic.h
      BranchInst.h
      DataTransfer.h
      Execution.h
      Logical.h
      MAINFILE.c
      OR.asm
      Readme.txt
      Register.h
      Shift.h
    Testing-File
      add.asm
      AND.asm
      memopb.asm
      memopd.asm
      memoph.asm
      memopw.asm
      OR.asm
      Readme.txt
      SLL.asm
      SLT.asm
      SRA.asm
      SRL.asm
      Sub.asm
      Test_Ex1.asm
      Test_Ex2.asm
      Test_Ex3.asm
      Test_Ex4.asm
  OUTLINE

Testing-File > Test_Ex3.asm
1 .main:
2 addi x5, x0, 12
3 mul x6, x5, x5
4 mul x6, x6, x5
5 addi x6, x6, 1
6 .print x6
7 end

TERMINAL
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/SL
T.asm
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/SR
A.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/SR
L.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/Su
b.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/Te
st_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/Te
st_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscy-emulator-main/Testing-File/Te
st_Ex3.asm
x6 : 1729
Apples-MacBook-Air:src apple$
```

Program 16

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1  .main:
2  addi x5, x0, 64
3  srai x6, x5, 2
4  .print x6
5  end
```

The terminal output shows the execution of the program:

```
x22: 1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRA.asm
x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRA.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRA.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Testing-File/Test_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Testing-File/Test_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Testing-File/Test_Ex3.asm
x6 : 1729
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Testing-File/Test_Ex4.asm
x6 : 16
Apples-MacBook-Air:src apple$
```

Program 17

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The image shows a code editor window with the following content:

```
EXPLORER
  OPEN EDITORS
    MAINFILE.c src
    AND.asm Testing-File
    Test_Ex5.asm Testing-File
    AND.asm src
  RISC-V-EMULATOR-MAIN
    AND.asm
    Arithmetic.h
    BranchInst.h
    DataTransfer.h
    Execution.h
    Logical.h
    MAINFILE.c
    OR.asm
    Readme.txt
    Register.h
    Shift.h
  Testing-File
    add.asm
    AND.asm
    memopb.asm
    memopd.asm
    memoph.asm
    memopw.asm
    OR.asm
    Readme.txt
    SLL.asm
    SLT.asm
    SRA.asm
    SRL.asm
    Sub.asm
    Test_Ex1.asm
    Test_Ex2.asm
    Test_Ex3.asm
    Test_Ex4.asm
    Test_Ex5.asm
    Test_Ex6.asm
  OUTLINE

MAINFILE.c
AND.asm
Testing-File
  Test_Ex5.asm
  AND.asm src

Testing-File > Test_Ex5.asm
1  .main:
2  addi x5, x0, 25
3  slli x5, x5, 2
4  addi x6, x0, 10
5  add x6, x5, x6
6  .print x6
7  end

TERMINAL
DEBUG CONSOLE
PROBLEMS
OUTPUT

x22: -8
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/SRL.asm
x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Sub.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Test_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Test_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Test_Ex3.asm
x6 : 1729
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Test_Ex4.asm
x6 : 16
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Test_Ex5.asm
x6 : 110
Apples-MacBook-Air:src apple$
```

Program 18

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

```
EXPLORER
  OPEN EDITORS
    MAINFILE.c src
    AND.asm Testing-File
    Test_Ex6.asm Testing-File
    AND.asm src
  RISC-V-EMULATOR-MAIN
    AND.asm
    memopb.asm
    memopd.asm
    memoph.asm
    memopw.asm
    OR.asm
    Readme.txt
    SLL.asm
    SLT.asm
    SRA.asm
    SRL.asm
    Sub.asm
    Test_Ex1.asm
    Test_Ex2.asm
    Test_Ex3.asm
    Test_Ex4.asm
    Test_Ex5.asm
    Test_Ex6.asm
    Test_Ex7.asm
    Test_Ex8.asm
    Test_Ex9.asm
    Test_Ex10.asm
    Test_Ex11.asm
    Test_Ex12.asm
    Test_Ex13.asm
    Test_Ex14.asm
    Test_Ex15.asm
    Test_Ex16.asm
    Test_Ex17.asm
    Test_Ex18.asm
    Test_Ex19.asm
    Test_Ex20.asm
  OUTLINE

MAINFILE.c
  AND.asm
  AND.asm src
  Test_Ex6.asm
  AND.asm src

Testing-File > Test_Ex6.asm
1 .main:
2 addi x7, x0, 5
3 addi x5, x0, 1
4 addi x6, x0, 1
5 loop:
6 mul x5, x6, x5
7 addi x6, x6, 1
8 bge x7, x6, loop
9 .print x5
10 end

TERMINAL
DEBUG CONSOLE
PROBLEMS
OUTPUT

x22: 4611686018427387896
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Su
b.asm
x22: 2
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex1.asm
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex3.asm
x6 : 1729
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex4.asm
x6 : 16
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex5.asm
x6 : 110
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex6.asm
x5 : 120
Apples-MacBook-Air:src apple$
```

Program 19

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The screenshot shows a code editor with the following content:

```
1 .foo:
2   addi x5, x0, 2
3   jalr x0, 0(x1)
4 .main:
5   addi x6, x0, 3
6   jal x1, .foo
7   add x7, x5, x6
8   .print x7
9 end
```

The terminal output shows the execution of the program:

```
x1 : -10
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex2.asm
x5 : -1
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex3.asm
x6 : 1729
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex4.asm
x6 : 16
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex5.asm
x6 : 110
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex6.asm
x5 : 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex7.asm
The instruction in line number 10 is INVALID.
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex8.asm
x7 : 5
Apples-MacBook-Air:src apple$
```

Program 20

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-

The image shows a code editor with the following assembly code in `Test_Ex9.asm`:

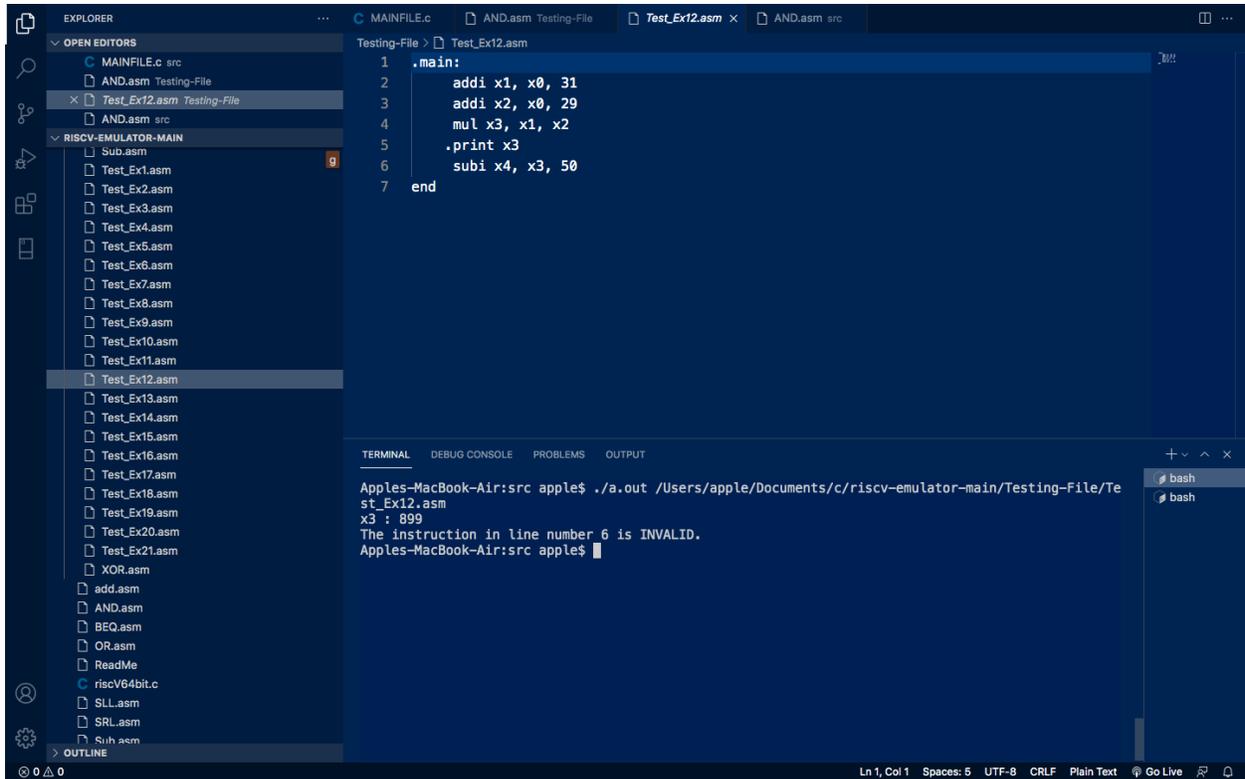
```
1 .main:
2 addi x5, x0, 31
3 addi x9, x0, 64
4 addi x10, x0, 1
5 addi x6, x0, 1
6 addi x7, x0, 0
7 .loop:
8 andi x8, x5, 1
9 bne x8, x10, .increment
10 addi x7, x7, 1
11 .increment:
12 srli x5, x5, 1
13 addi x6, x6, 1
14 bge x9, x6, .loop
15 .print x7
16 end
```

The terminal output shows the execution of the program, with the following error message:

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex4.asm
x6 : 16
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex5.asm
x6 : 110
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex6.asm
x5 : 120
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex7.asm
The instruction in line number 10 is INVALID.
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex8.asm
x7 : 5
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex9.asm
x7 : 5
Apples-MacBook-Air:src apple$
```

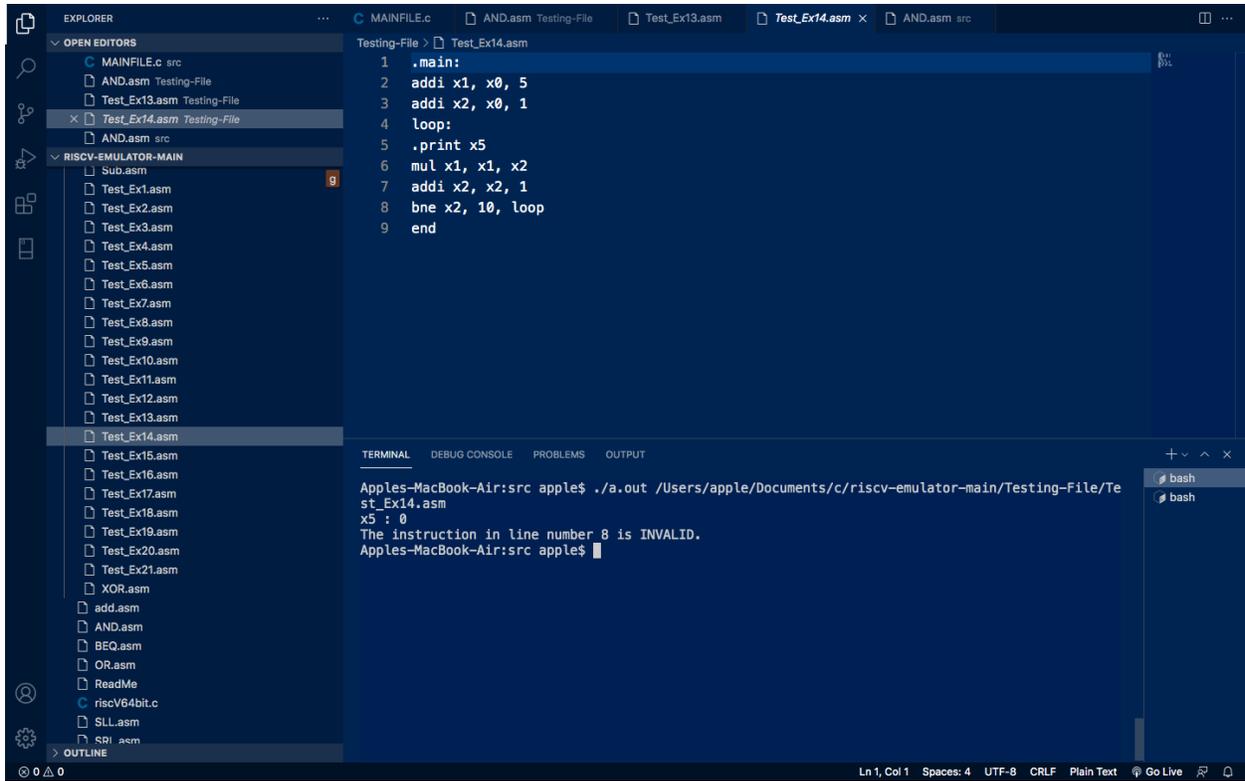
Program 21

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-



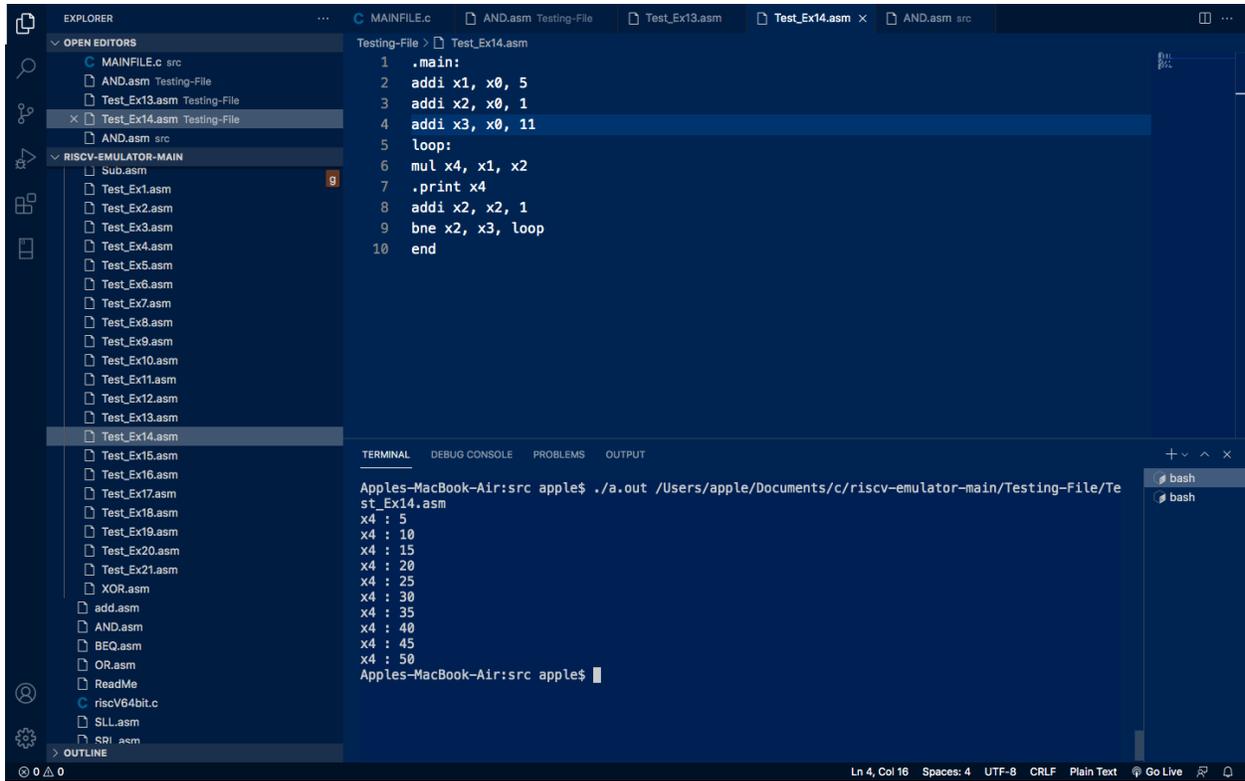
Program 22

This is a program of an Example from the Book Computer Organisation and Architecture run on the Designed Interpreter:-



Program 23

This is a program to print multiples of '5' run on the Designed Interpreter:-



Program 24

This is a program to print multiple of '9' run on the Designed Interpreter:-

The screenshot shows a code editor with the following assembly code in the main window:

```
Testing-File > Test_Ex15.asm
1  .main:
2  addi x1, x0, 9
3  addi x2, x0, 1
4  addi x3, x0, 11
5  .loop:
6  mul x4, x1, x2
7  .print x4
8  addi x2, x2, 1
9  bne x2, x3, .loop
10 end
```

The terminal window shows the execution output:

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex15.asm
x4 : 9
x4 : 18
x4 : 27
x4 : 36
x4 : 45
x4 : 54
x4 : 63
x4 : 72
x4 : 81
x4 : 90
Apples-MacBook-Air:src apple$
```

The Explorer sidebar on the left shows a project structure with folders for 'OPEN EDITORS', 'RISCV-EMULATOR-MAIN', and 'OUTLINE'. The terminal window at the bottom shows the command prompt and the execution output.

Program 25

This is a program to print numbers from 2 to 20 run on the Designed Interpreter:-

```
1  .main:
2  addi x1, x0, 1
3  addi x2, x0, 1
4  addi x4, x0, 20
5  loop:
6  add x3, x1, x2
7  .print x3
8  addi x2, x2, 1
9  bne x2, x4, loop
10 end
```

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex16.asm
x3 : 2
x3 : 3
x3 : 4
x3 : 5
x3 : 6
x3 : 7
x3 : 8
x3 : 9
x3 : 10
x3 : 11
x3 : 12
x3 : 13
x3 : 14
x3 : 15
x3 : 16
x3 : 17
x3 : 18
x3 : 19
x3 : 20
Apples-MacBook-Air:src apple$
```

Program 26

This is a program to print squares of numbers from 1 to 10 run on the Designed Interpreter:-

```
1  .main:
2  addi x1, x0, 1
3  addi x2, x0, 11
4  loop:
5  mul x3, x1, x1
6  .print x3
7  addi x1, x1, 1
8  bne x1, x2, loop
9  end
```

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex18.asm
x3 : 1
x3 : 4
x3 : 9
x3 : 16
x3 : 25
x3 : 36
x3 : 49
x3 : 64
x3 : 81
x3 : 100
Apples-MacBook-Air:src apple$
```

Program 27

This is a program to print Cubes of numbers from 1 to 10 run on the Designed Interpreter:-

```
1  .main:
2  addi x1, x0, 1
3  addi x2, x0, 11
4  loop:
5  mul x3, x1, x1
6  mul x3, x3, x1
7  .print x3
8  addi x1, x1, 1
9  bne x1, x2, loop
10 end
```

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex19.asm
x3 : 1
x3 : 8
x3 : 27
x3 : 64
x3 : 125
x3 : 216
x3 : 343
x3 : 512
x3 : 729
x3 : 1000
Apples-MacBook-Air:src apple$
```

Program 28

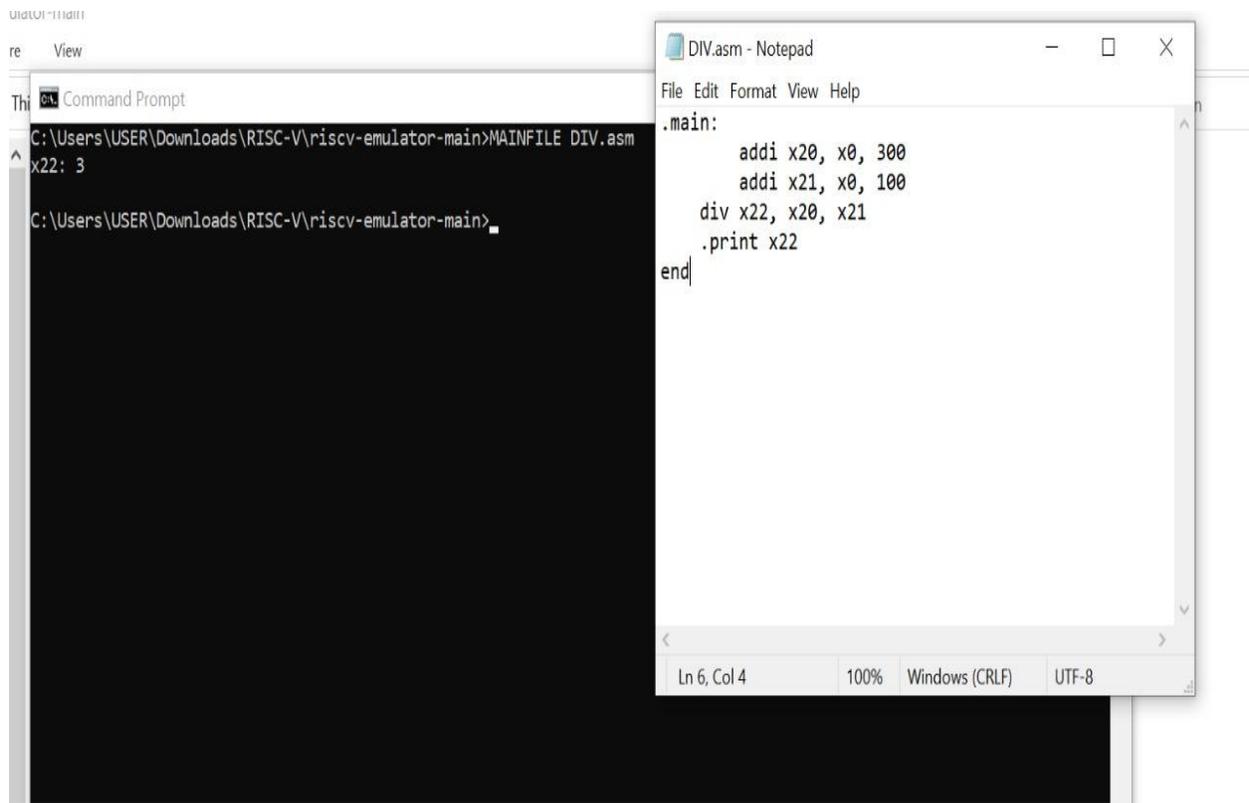
This is a program to Swap two numbers run on the Designed Interpreter:-

```
1  .main:
2  addi x1, x0, 7
3  addi x2, x0, 5
4  add x3, x0, x1
5  add x1, x0, x2
6  add x2, x1, x3
7  sub x2, x2, x1
8  .print x1
9  .print x2
10 end
```

```
Apples-MacBook-Air:src apple$ ./a.out /Users/apple/Documents/c/riscv-emulator-main/Testing-File/Te
st_Ex20.asm
x1 : 5
x2 : 7
Apples-MacBook-Air:src apple$
```

Program 29

This is a program to Division of two numbers run on the Designed Interpreter:-



Program 30

This is a program of Multiplication of two numbers run on the Designed Interpreter:-

```
Command Prompt
Microsoft Windows [Version 10.0.19041.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\USER>cd C:\Users\USER\Downloads\RISC-V\riscv-emulator-main
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE MUL.asm
x22: 2000
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>
```

```
MUL.asm - Notepad
File Edit Format View Help
.main:
    addi x20, x0, 40
    addi x21, x0, 50
    mul x22, x20, x21
    .print x22
end
Ln 6, Col 4    100%    Windows (CRLF)    UTF-8
```

Program 31

This is a program to find remainder of two numbers run on the Designed Interpreter:-

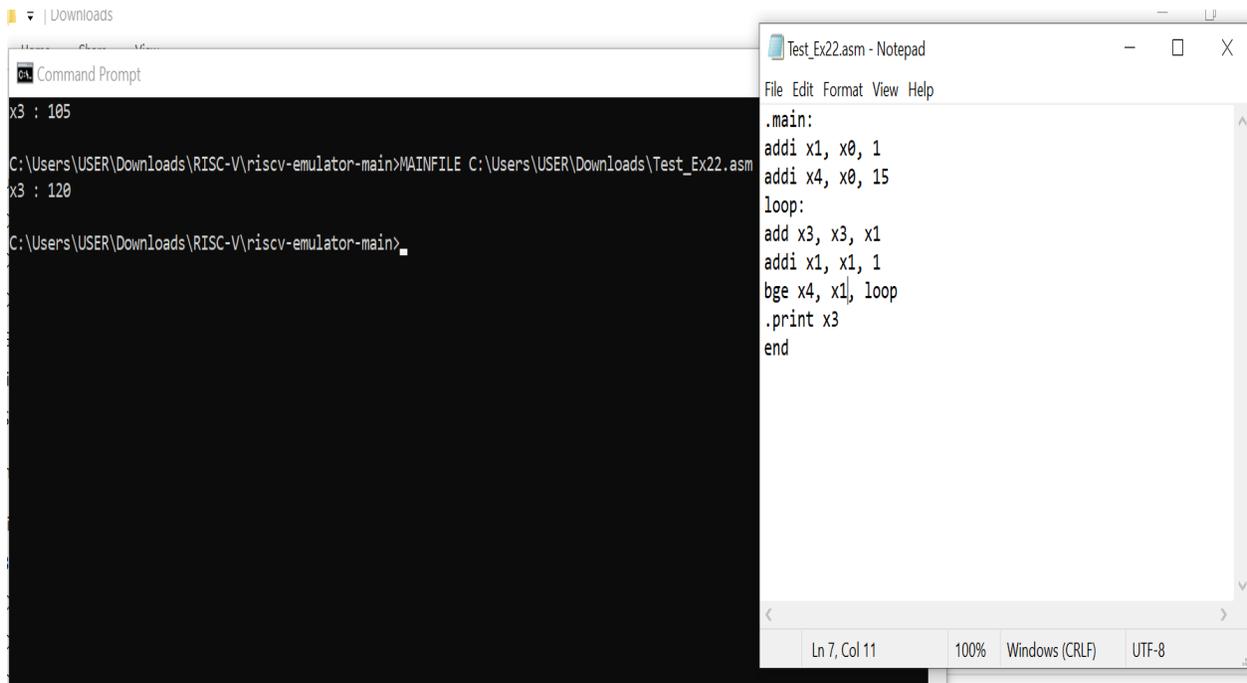
```
Command Prompt
Could not read file!!!

C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE C:\Users\USER\Downloads\REM.asm
x22: 8
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>
```

```
REM.asm - Notepad
File Edit Format View Help
.main:
    addi x20, x0, 25
    addi x21, x0, 17
    rem x22, x20, x21
    .print x22
end
Ln 6, Col 4    100%    Windows (CRLF)    UTF-8
```

Program 32

This is a program to find sum of first 'n' natural numbers run on the Designed Interpreter:-



The image shows a screenshot of a RISC-V emulator window and a Notepad window. The emulator window displays the output of the program, showing the value of register x3 at two different points: 105 and 120. The Notepad window shows the assembly code for the program, which includes a loop that increments x1 and x3 until x1 reaches 15.

```
Command Prompt
x3 : 105
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE C:\Users\USER\Downloads\Test_Ex22.asm
x3 : 120
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>
```

```
Test_Ex22.asm - Notepad
File Edit Format View Help
.main:
addi x1, x0, 1
addi x4, x0, 15
loop:
add x3, x3, x1
addi x1, x1, 1
bge x4, x1, loop
.print x3
end
Ln 7, Col 11 100% Windows (CRLF) UTF-8
```

Program 33

This is a program to load 32-bit immediate run on the Designed Interpreter:-

```
Command Prompt
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE DIV.asm
x22: 3
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE lui.asm
x22: 819700
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>

Odd.asm - Notepad
File Edit Format View Help
.main:
    lui x20, 100
    addi x20, x20, 300
    lui x21, 100
    addi x21, x21, 200
    add x22, x20, x21
    .print x22
end|
Ln 8, Col 4 100% Windows (CRLF) UTF-8
```

Program 34

This is a program to find odd or even number 1 for odd and 0 for even run on the Designed Interpreter:-

```
Command Prompt
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>MAINFILE C:\Users\USER\Downloads\Odd.asm
x22: 1
C:\Users\USER\Downloads\RISC-V\riscv-emulator-main>

Odd.asm - Notepad
File Edit Format View Help
.main:
    addi x20, x0, 301
    addi x21, x0, 2
    rem x22, x20, x21
    .print x22
end|
Ln 6, Col 4 100% Windows (CRLF) UTF-8
```