

# Homework 8

<b>Due</b>	May 24 by 11:59pm	<b>Points</b>	100	<b>Submitting</b>	a file upload
<b>File Types</b>	circ, pdf, txt, ys, yo, hex, xls, xlsx, c, h, s, zip, tar, and gz			<b>Available</b>	after May 13 at 11:59pm

## New Instructions, and High-Level Languages

Submit online via Canvas.

We accept only the following file formats:

- .circ
- .pdf
- .txt
- .ys,.yo
- .hex
- .xls, .xlsx
- .c,.h,.s
- zip,tar,gz of the above

## Q1: 60 pts

Extend your Y86 to implement the following instructions:

- Right shift:
  - shr rA, rB
  - which does this:  $rb \leftarrow rA \gg 1$
- Add immediate:
  - addi val, rA
  - which does this:  $rA \leftarrow rA + val$
- Add from memory:
  - addm D(rA), rB
  - which does this:  $rB \leftarrow rB + M[D + rA]$

In your submission, be sure to include:

- the revised FSM
- the revised microarchitecture
- the revised control ROM spreadsheet
- the revised version of Fig 4.2
- how you tested the new instructions

## Q2: 20pts

Write a C program that does the same thing as Q4 from HW5.

- have single-byte globals for the month and day digits. E.g.,

```
unsigned char monthB = 0;
```

```
    unsigned char monthA = 3;
    unsigned char dayB = 3;
    unsigned char dayA = 2;
```

asks about "March 32"

- When the program ends, the 4-byte word at "output" contains
  - 0, if the date is does not exist in the 2014 calendar
  - 1, if it does
  - 0xE, if there's an error

It may be helpful to build on [hw8.c \(https://ssl.cs.dartmouth.edu/~sws/cs51-s15/hw8.c\)](https://ssl.cs.dartmouth.edu/~sws/cs51-s15/hw8.c) which repeatedly drives your code with four digits grabbed from stdin.

## Q3: 20 pts

Compare and contrast the assembly language produced by the above (with -O1 -S ) with the assembly language you wrote for HW5 Q4.

Hwk 8 Rubric		
Criteria	Ratings	Pts
Q1. shr <a href="#">view longer description</a>		20 pts
Q1. addi <a href="#">view longer description</a>		20 pts
Q1. addm <a href="#">view longer description</a>		20 pts
Q2. Clarity, etc.		6 pts
Q2. Correctness <a href="#">view longer description</a>		14 pts
Q3. Comparison		20 pts
		Total Points: 100