Rylan Thornburg

Homework 2 - Key

Microprocessor System Design- ELEN 120
Due 10/2/2023
30 points

These problems are to be solved without a calculator or computer. There is a table of powers of 2 in decimal at the end that may be helpful.

1) Bitwise Logic Operations:

   For each bitwise logic operation, compute the result. EOR is exclusive or for this problem. 2 points each:

`0x0f0f0f0f OR 0xff00ff00`

0xff0fff0f

`0xff00ff00 AND 0x0f0f0f0f`

0x0f000f00

`0xff00ff00 EOR 0x0f0f0f0f`

0xf00ff00f

`0x12345678 AND 0xfc00fc00`

0x10005400

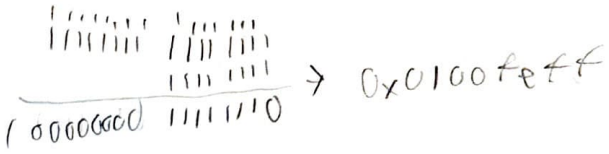
`0x0ff00ff0 OR 0x12345678`

0x1ff45ff8

2) Simple Instructions: For each question, assume that the initial value of R1 is `0x0000ffff` and the initial value of R2 is `0x00ffff00`. What is the value in R3 after each instruction executes? (2 points each)

```
eor   r3,r2,r2
```
r3 = 0x00000000

```
add   r3,r2,r1
```
r3 = 0x0100feff



```
sub   r3,r2,r1
```
r3 = 0x00feff01

```
and   r3,r1,r2
```
r3 = 0x00ffff00

```
add   r3,r1,r1
```
r3 = 0x0001fffe

3) Binary Arithmetic: For each question, I have supplied 2 signed 16-bit numbers in hexadecimal. Add them and provide the answer as a signed 16-bit number in hexadecimal. No credit if you do not get the format correct. (2 points each)

0x1111 0x3333

0x4444

0xffff 0x0001 −1 + 1

0x0000

0xffff 0xfffe → −2

−1

0xfffd

0x0f0f 0x0101

0x1010

0xcdef 0x1111

0xdf00