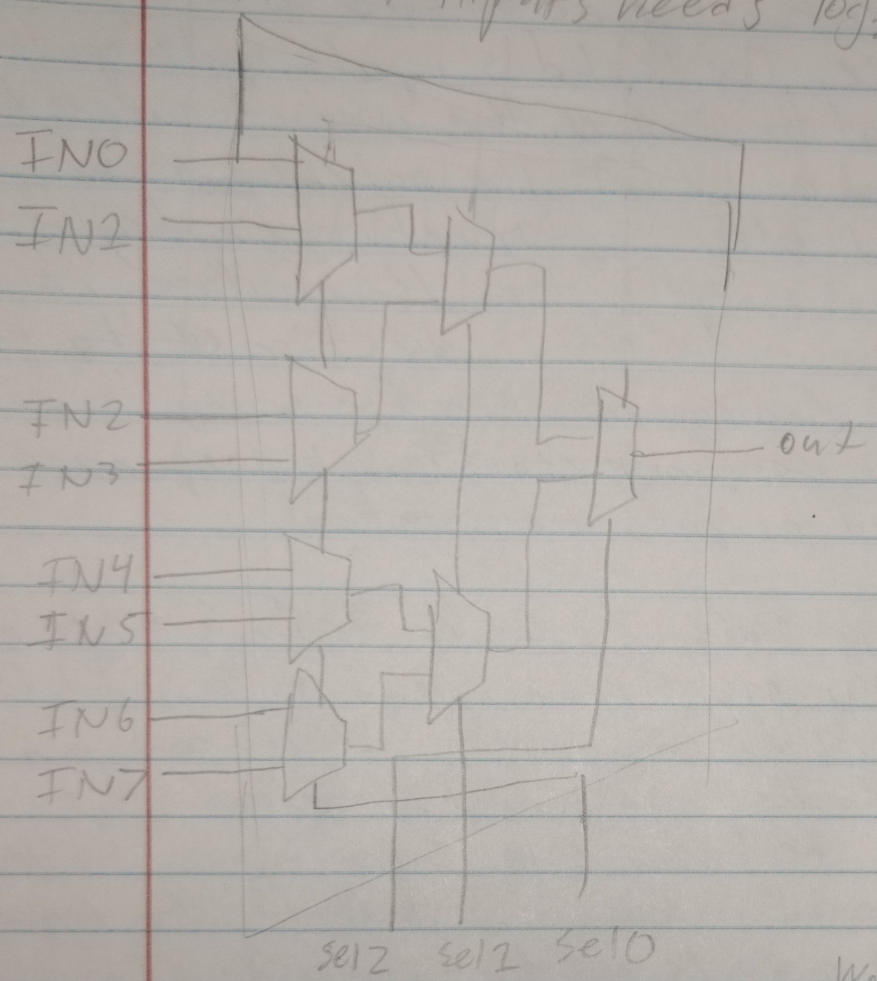
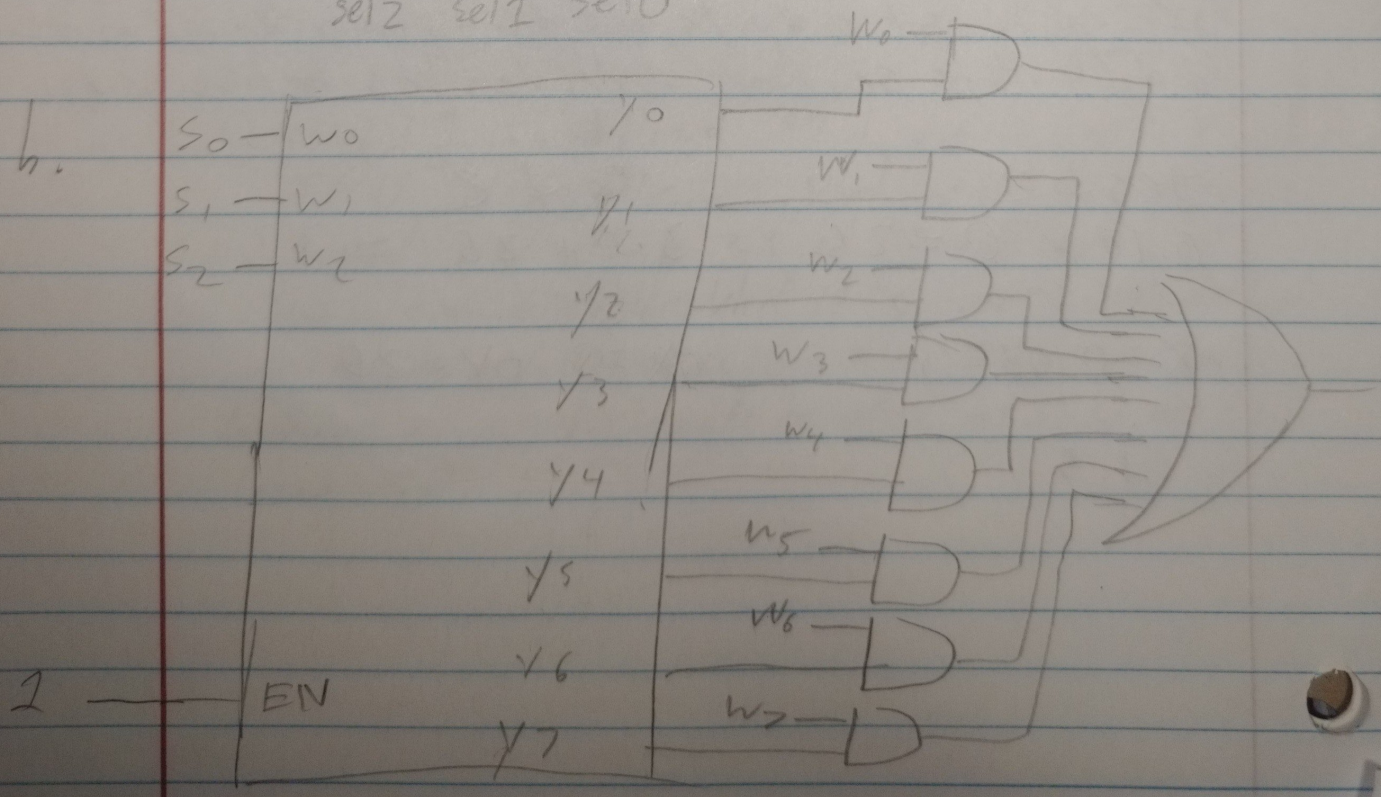
HW 0 CPRE 381 Joseph Schmidt

7.

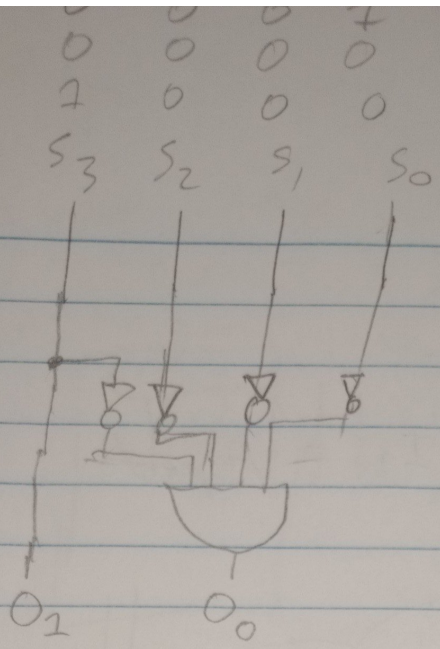
a. 6 different inputs needs $\log_2 6 = 2.33 \approx 3$



b.



c.



Outputs
00 — positive
10 — negative
01 — zero

d. 10^{12} picoseconds/sec * 60 secs/min

6×10^{13} $\log_2(6 \times 10^{13}) = 45.77$

45.77 have to round up to store decimal
46 bits

e. 0x38157EE9

0011 1000 0001 0101 0111 1110 1110 1001

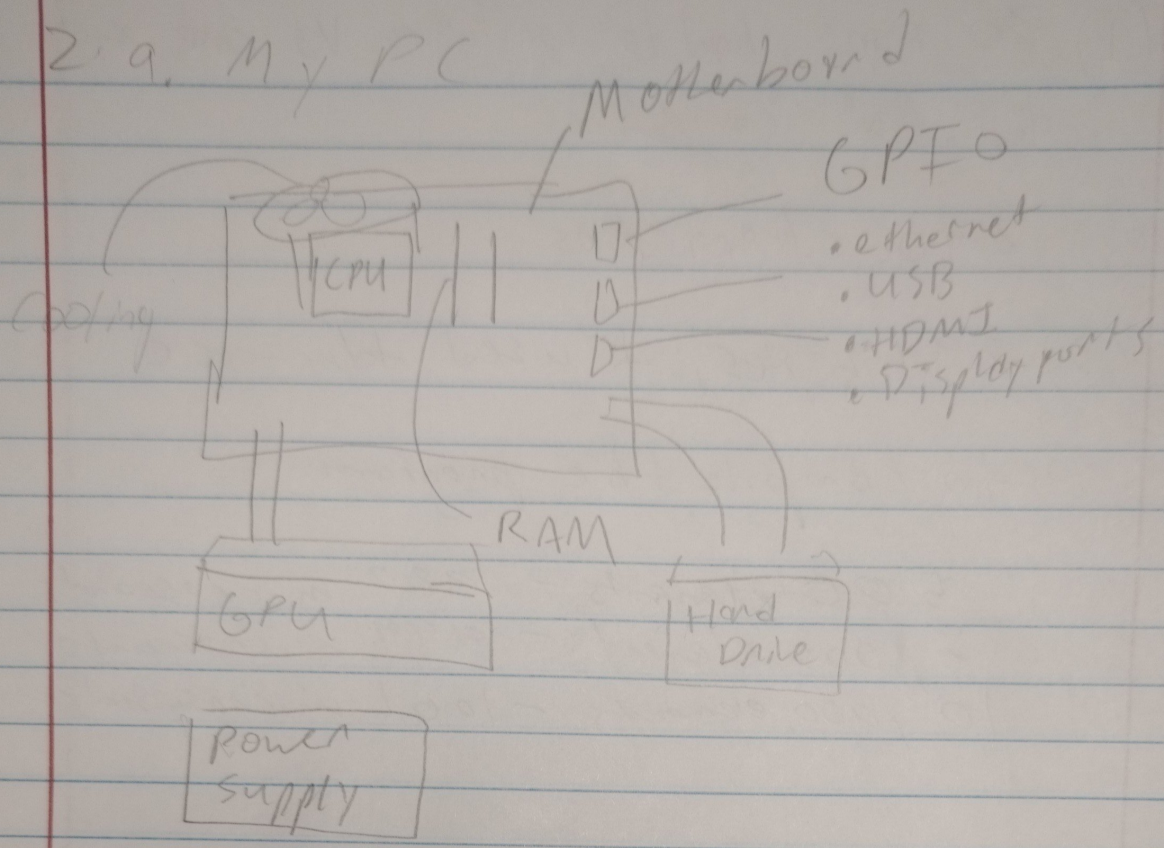
3 8 1 5 7 14 14 9

$3 \times 16^7 + 8 \times 16^6 + 1 \times 16^5 + 5 \times 16^4 + 7 \times 16^3 + 14 \times 16^2 + 14 \times 16^1 + 9 \times 16^0$

$= 940932841_0$

HW 00

2. a. My PC



b.

1942 - Atanasoff-Berry computer 3000 bits
1951 - ERA 1101, 48KB (32 ms access time)
1960 - IBM 402 16KB (top of the line computer)
1971 - Kenbak-1 256 bytes
1977 - Apple 2 4KB Ram
1982 - Commodore 64 64KB Ram
1990 - Macintosh Classic 1 MB expandable to 4 MB
2000 - 256 MB Ram sticks
2016 - iMac 2 GB or 4 GB
2020 - Skytech gaming Azure
Prebuilt PC - 32 GB

C. (1) 30 mins, had to configure VS code and download compiler

(2) 240 characters

(3) 294 bytes, I used tdm-gcc to compile the program.

(4) 500 elements - 987 microseconds,
8,000 elements - 999 microseconds
10,000 elements - 1001 microseconds

It took me around 5 minutes to test 3 arrays of different sizes.