EECE 2116, Sec #2

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HW #10

4/11/18

1.

a. [1][2][3][4][5][6][7][8][9][10]

|  |  |
| --- | --- |
| 1998 | 7,500,000 |
| 1999 | 9,500,000 |
| 2000 | 21,000,000 |
| 2001 | 45,000,000 |
| 2002 | 55,000,000 |
| 2003 | 105,900,000 |
| 2004 | 112,000,000 |
| 2005 | 228,000,000 |
| 2006 | 291,000,000 |
| 2007 | 463,000,000 |
| 2008 | 758,000,000 |
| 2009 | 904,000,000 |
| 2010 | 1,200,000,000 |
| 2011 | 2,270,000,000 |
| 2012 | 3,100,000,000 |
| 2013 | 4,200,000,000 |
| 2014 | 5,560,000,000 |
| 2015 | 7,100,000,000 |
| 2016 | 7,200,000,000 |
| 2017 | 19,200,000,000 |

b. One of the sources to acquire new knowledge is from online forum like Stackoverflow or Stackexchange. If our intentions are not researching for inventing new technologies but rather learn state of the art knowledge, I believe it is a great place to go. They are online and free to access for everyone. Another place for new knowledge could be MOOC like Coursera. However, this source applies more closely to knowledge that is far from our expertise. But innovation often come from other sources, just like in Silicon Valley depicts, new algorithm doesn’t necessarily come from rigid math calculations but also could be a joke that your friends made. I am a senior and these two sources have greatly enhanced my self-learning ability throughout the year, which is quite crucial to the engineering track.

2. 64 = 2^6 so 6 selection lines for each of the multiplexers and decoder.

3.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Op# | DA | AA | BA | FS | Operation | Result |
| 1 | R3 | R3 | R1 | A+B | R3🡨 R3+R1 | R3=01100111=g |
| 2 | R4 | R4 | R1 | AvB | R4🡨 R4 v R1 | R4=01110100=t |
| 3 | R5 | R5 | R1 | AxorB | R5🡨 R5 xor R1 | R5=01101100=l |
| 4 | R1 | R1 | R0 | A’ | R1🡨 R1’ | R1=11011111 |
| 5 | R1 | R1 | R0 | A+1 | R1🡨 R1+1 | R1=11100000 |
| 6 | R6 | R6 | R1 | A+B’+1 | R6🡨 R6+R1’+1 | R6=01100001=a |
| 7 | R7 | R7 | R1 | A+B’+1 | R7🡨 R7+R1’+1 | R7=01101001=i |
| 8 | R1 | R7 | R0 | A | R1🡨 R7 | R1=01101001=i |

R1=i, R2=D, R3=g, R4=t, R5=l, R6=a, R7=i

Digital

4.

(a) 16 address lines, 8 input/output data lines

(b) 19 address line, 32 input/output data lines

(c) 26 address lines, 64 input/output data lines

(d) 31 address lines, 1 input/output data lines

REF:

[1] ["The MOS 6502 and the Best Layout Guy in the World"](http://research.swtch.com/6502). swtch.com. Retrieved 2014-08-09.

[2] [*Microprocessors: 1971 to 1976*](http://icarus.cs.weber.edu/home/dferro/ada/Christiansen_Report_Finished/Finishedmicroprocessors.doc) Christiansen

[3] ["Microprocessors 1976 to 1981"](http://icarus.cs.weber.edu/home/dferro/ada/Christiansen_Report_Finished/Finishedmicroprocessors.doc). weber.edu. Retrieved 2014-08-09.

[4] ["W65C816S 16-bit Core"](http://www.westerndesigncenter.com/wdc/w65c816s-core.cfm). *www.westerndesigncenter.com*. Retrieved 2017-09-12.

[5] Demone, Paul (2000-11-09). ["ARM's Race to World Domination"](http://www.realworldtech.com/arms-race/). real world technologies. Retrieved 2015-07-20

[6]  *Hand, Tom.*[*"The Harris RTX 2000 Microcontroller"*](http://soton.mpeforth.com/flag/jfar/vol6/no1/article1.pdf)*(PDF). mpeforth.com. Retrieved 2014-08-09.*

[7]  [*"Forth chips list"*](http://www.ultratechnology.com/chips.htm)*. UltraTechnology. 2001-03-15. Retrieved 2014-08-09.*

[8] Koopman, Philip J. (1989). ["4.4 Architecture of the Novix NC4016"](https://www.ece.cmu.edu/~koopman/stack_computers/sec4_4.html). *Stack Computers: the new wave*. Ellis Horwood Series in Computers and Their Applications. Carnegie Mellon University. [ISBN](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [0745804187](https://en.wikipedia.org/wiki/Special:BookSources/0745804187). Retrieved 2014-08-09

[9] Bosshart, P.; Hewes, C.; Mi-Chang Chang; Kwok-Kit Chau; Hoac, C.; Houston, T.; Kalyan, V.; Lusky, S.; Mahant-Shetti, S.; Matzke, D.; Ruparel, K.; Ching-Hao Shaw; Sridhar, T.; Stark, D. (October 1987). "A 553K-Transistor LISP Processor Chip". *IEEE Journal of Solid-State Circuits*. sc-22 (5): 202–3. [doi](https://en.wikipedia.org/wiki/Digital_object_identifier):[10.1109/ISSCC.1987.1157084](https://doi.org/10.1109%2FISSCC.1987.1157084).

[10] Fahlén, Lennart E.; Stockholm International Peace Research Institute (1987). ["3. Hardware requirements for artificial intelligence § Lisp Machines: TI Explorer"](https://books.google.com/books?id=88Mcg5MMPdYC&pg=PA57). *Arms and Artificial Intelligence: Weapon and Arms Control Applications of Advanced Computing*. SIPRI Monograph Series. Oxford University Press. p. 57. [ISBN](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [978-0-19-829122-0](https://en.wikipedia.org/wiki/Special:BookSources/978-0-19-829122-0).