

# Code Wars 2018

## Hardware Prelims

Name: \_\_\_\_\_

School: \_\_\_\_\_

*Questions marked <sup>42</sup> contribute to Techathlon event*

1. Expand
  - a. NVMe
  - b. RISC
  - c. LGA
  - d. IOMMU
2. Write a disadvantage of using liquid metal instead of traditional thermal compound while cooling your CPU.
3. In 1-2 words, what makes a Core i7 8086K better than a Core i7 8700K?
4. In an AMD Threadripper 2990WX, not each CPU core has equal access to memory - some cores must go through a longer or shorter path to access data depending on which memory channel it is in. What technology is used to make sure that programs are aware of this and allocate memory accordingly?
5. Name the sockets used by the following CPUs:
  - a. Intel Core 2 Quad Q8400
  - b. AMD Athlon X4 950
  - c. AMD Epyc 7601
  - d. Intel Core i5 7640X
6. Name the current fastest supercomputer on the planet.
7. Name the first series of x86-64 CPUs to ever be released.
8. Why would you prefer a TN monitor for gaming over IPS?
9. Why are RAID 5 and RAID 6 considered safer for data storage than RAID 0 even though all of them use striping to make disk access faster across drives?

10. Name AMD's server GPU lineup designed for deep learning applications.
11. Arrange the following types of NAND storage in increasing order of performance: QLC, MLC, SLC, TLC. What do the first letters of each of these indicate?
12. Name Intel's cancelled general purpose GPU project whose technology eventually made its way into its Xeon Phi line of processors.<sup>42</sup>
13. Name the defining feature of the Razer Huntsman Elite which distinguishes it from other mechanical keyboards.
14. X is a rendering technique for generating an image by tracing the path of light as pixels in an image plane and simulating the effects of its encounters with virtual objects. Real-time X was a big talking point in the recent release of Y, as predecessors of Y would take hours to render the same graphics due to lack of specialized hardware. ID X and Y.
15. X was invented for use in telephone switchboards in the 19th century and is still widely used. It is cylindrical in shape, with a grooved tip to retain it. Three-contact versions are known as TRS connectors, where T stands for "tip", R stands for "ring" and S stands for "sleeve". Similarly, two-, four- and five- contact versions are called TS, TRRS and TRRRS connectors respectively. Only recently has X started to disappear from our lives. ID X.
16. Name the hardware-level attack, made public in January 2018, that exploits a feature in CPUs known as "branch prediction" or "speculative execution", and affects nearly all CPUs that use this process to speed up computation.<sup>42</sup>
17. Also known as the iAPX 86, this 16-bit microprocessor chip was released in mid 1978, and due to its widespread adoption in the original IBM PC, turned x86 into the de facto standard for desktop computers worldwide. What is this chip?<sup>42</sup>
18. \_\_\_\_\_ is a motherboard configuration specification developed by Intel in 1995 to improve on previous. It was the first major change in desktop computer enclosure, motherboard and power supply design in many years, improving standardization and interchangeability of parts. The specification defines the key mechanical dimensions, mounting point, I/O panel, power and connector interfaces between a computer case, a motherboard and a power supply. FITB.
19. What is the name of the Intel-AMD collaboration chip which uses an Intel 8th generation CPU core and Radeon Vega graphics?
20. What is the claim to fame of the Intel Core i3-8121U?
21. What is the second most powerful computer in all of space and time, built by a race of hyperintelligent multidimensional beings to compute the answer to life, the universe, and everything?

1. Expanded:
  - a. Non-volatile memory express
  - b. Reduced instruction set computer
  - c. Land grid array
  - d. Input output memory management unit
2. Faster degradation, needs to be reinstalled every 6 months-ish

Also valid: may leak out and short components because electrically conductive
3. Binning/silicon lottery
4. NUMA (Non-Uniform Memory Access)
5. Sockets:
  - a. LGA775
  - b. AM4
  - c. SP3
  - d. LGA2066
6. Summit
7. AMD Opteron
8. High refresh rate and/or lower response time
9. Parity bit(s)
10. Radeon Instinct
11. QLC < TLC < MLC < SLC. Quad/tri/multi(two)/single-level cell NAND - more bits per cell means lower cost but less speed.
12. Project Larrabee
13. Optical/opto-mechanical switch
14. Ray tracing, NVIDIA RTX
15. Audio connector/headphone jack
16. Spectre (not Meltdown!)
17. Intel 8086
18. ATX
19. Kaby Lake G
20. First 10nm Intel CPU
21. Deep Thought