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Answers to P6:Task 2 Questions:

1. Computer architecture didn't have the high number registers that we do now because hardware was precious, and they didn't have the capacity to afford the number of registers we see today.

2. The CDC 6600 is considered by many to be the first supercomputer. It was released in 1963.

3. Register-memory architectures were most popular in the 1960s.

4. Intel x86 had variable-length instruction because it minimized code size and to match varying operand specifications.

5. ARM, MIPS, and RISC-V have versions that offer 16-bit and 32-bit instruction formats for embedded applications, where having a smaller code size is still important and helps improve instruction cache hit rates. These versions were made with that in mind.

6. One benefit of stack architectures is that it simplifies compilers by completely eliminating register allocation. Another benefit of it is that they help allow for compact instruction coding, which stops memory size from being an excuse to not use high level programming.

7. False.

8. ARM, ARMv7, and ARMv8 are all listed separately because they are not the same. Each one uses different instruction sets, with ARMv8 adding a 64 bit address extension and redesigning the instruction set to look similar to MIPS.

9. One factor that contributed to the IBM PC's success over the Macintosh is that IBM opened the architecture of the PC, which allowed the PC clone industry to boom, while

Apple did not allow Macintosh clones based on it's 6800 microprocessor. So, while the 6800 was technically better, IBM's open architecture strategy allowed their product to flourish over Apple's.

10. I would say that MiniCUSP is a register-memory architecture because we are loading values into registers (such as labels and instructions) via unordered maps, and using memory from the .csp files to output the machine code of the given inputs. We can perform operations on both the 'registers', or labels/instructions as well as directly from our input files.

11. I would say that x86-64 is a reduced instructions set architecture because there are fixed instruction lengths and load-store instruction sets in x86-64, two pieces of RSIC philosophy.

12. LISP was originally an interpreted language, but compilers were later developed for it. So, now it has the ability to be either compiled or interpreted.

13. Pascal replaced Algol-60 as the most popular language for academics to teach programming because of its ease of implementation.

14. This argument applies today because different programming languages have different focuses. For example, C++ has very fast performance, but it's syntax and readability is relatively hard. On the other hand, Python has slower performance, but it's syntax and readability is very good and easy to pick up. So, it depends on the project you are working on whether you value the extra speed C++ gives, or if you would rather have the readability and simplicity of a language like Python.

15. Researchers "recognizing that coloring a graph with a minimum number of colors was equivalent to allocating a fixed number of registers to the unlimited number of virtual

registers used in intermediate forms" was relevant to a breakthrough in register allocation

for compiler optimizations.