

Problem Set 12

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1. Input
2. Memory
3. Datapath
4. Control
5. Output (given)

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1. Data input
2. Data output
3. Data processing
4. Data storage

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The correct answer is D) 32 bits. MIPS machines have 32 32-bit registers.

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The correct answer is C) 2's complement.

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The correct answer is B) Terabyte. 1 Terabyte is 10^{12} bytes. This means $1,099,511,627,776 \text{ bytes} * \frac{1TB}{10^{12} \text{ bytes}} = 1.099 \text{ TB} \sim 1 \text{ TB}$.

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Overflow is when the result of a computation is too large to fit in the available registers.

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1. Normalization is the standard representation of exponential numbers

2. It allows the simplification of the algorithms and hardware
3. It allows for higher accuracy in the represented values

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The first "killer app" was email.

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0's in every bit represents exactly 0 in IEEE 754 format.

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This statement is false. Natural languages are ambiguous and verbose, which make them very unsuitable to use as programming languages.

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This statement is true. While a mouse with a track ball doesn't require an embedded processor, an optical mouse does require an embedded processor to perform real-time computation of the optical image.

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RAID stands for Redundant Array of Inexpensive Disks and is an umbrella term for a selection of strategies that provide increased data security and performance through redundancy. RAID 1 is a specific strategy that writes data to two or more hard drives simultaneously. This way, read requests can be handled by any available drive, and no data is lost through the failure of a single disk (or multiple, given the total number of copies).

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This statement is False. The I/O channel would cause an interrupt when the I/O process is requested and started, and would return from the interrupt when the process is completed.

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The correct answer is C). The main purpose of Interrupts is to allow more efficient processing of multiple concurrent tasks. A simple example would be trying to type in the terminal while a computation algorithm is executing. Without interrupts to process the keystrokes, and input would need to wait until the, potentially long, running programs finishes executing.

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The other main task is to provide the user-interface to the computer. This makes the computer much more friendly and easy to use by providing an abstraction to the actual hardware.

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No, it is never safe for a MIPS user program to use the **\$k0 or \$k1** registers. These two registers are reserved, by convention, for the OS to use in the event of an exception. All other registers are saved and restored when control is given back to the program, but the data in these two registers could be lost or changed at any time.

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Module 13 lecture D.

1. Access Control
2. Information flow control
3. Certification
4. Secure building

5. Encryption

6.

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Yes, I did complete the online Course Evaluation Survey.