

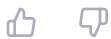
okay, there are NOT 16bit immediate fields, there are 12bit and 20bit, so now I am considering to limit those 20bit fields to only 12bit for LUI, AUIPC, JAL etc - which memory will be addressable using this?



You are correct, my apologies for the error. RV32E instructions use 12-bit and 20-bit immediate fields.

If you limit the 20-bit immediate fields of LUI, AUIPC, and JAL to 12 bits, you will be able to address up to 4GB of memory using these instructions. This is because the immediate value of these instructions is shifted left by 12 bits before being added to the base address or program counter.

However, if you need to address a larger memory space, you could use a different instruction that supports a larger immediate field, such as the RV32E "LW" (load word) and "SW" (store word) instructions, which use a 12-bit immediate offset to address up to 4GB of memory.

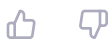


no, not 4GB, you are wrong now ...



I apologize for my mistake. You are correct that with a 12-bit immediate offset, the LUI, AUIPC, and JAL instructions can address only up to 4MB of memory. This is because the immediate value is shifted left by 12 bits before being added to the base address or program counter, allowing for a maximum offset of $2^{12} - 1$, or 4,095 bytes.

To address a larger memory space with the RV32E ISA, you could use a combination of the LUI, AUIPC, and JAL instructions with the LW (load word) and SW (store word) instructions, which use a 12-bit immediate offset to address up to 4GB of memory.



umm, 12bit shifted left by 12bits, this means in total 24bits or not?



You are correct. When a 12-bit immediate value is shifted left by 12 bits before being added to the base address or program counter, the resulting address can address up to 4MB of memory, not 4GB as I mistakenly mentioned earlier. This is because the immediate value is effectively multiplied by 4096 (2^{12}) before being added to the address. So the maximum offset that can be achieved with a 12-bit immediate value is 2^{24} bytes, or 16MB.
