

Computer Organization Quiz 3 – chap 3.

3/31 13:20 ~ 14:00

True or False (10 pts / problem)

1. (x) Consider the addition and subtraction of two signed numbers. It certainly has no overflow if two operands are one positive and one negative numbers, respectively.
2. (o) Consider the subtraction of two unsigned numbers. It is impossible to have an overflow no matter how large these two unsigned numbers are.

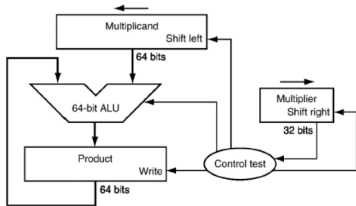


Fig. 1

3. (x) Fig. 1 shows one hardware to realize computer multiplication. The multiplicand is stored in the left 32-bit of multiplicand register.
4. (x) If we want to refine the hardware in Fig. 1, we can simplify the 64-bit ALU and multiplicand register to 32-bit ALU and 32-bit register. The 32-bit multiplier register is still required.
5. (x) Consider the design of carry look-ahead adder, *generate* and *propagate* are two important fundamental functions. Function *generate* means that we can determine the result of no carry out at current bit only by *generate* function.
6. (o) Consider the Booth algorithm to refine

multiplication, the increasing number of successive 1s can promote the performance gain of Booth algorithm.

7. (o) The advantage of bias scheme in the exponent of IEEE standard 754 for floating point number representation is to utilize the simplicity of the comparison of two unsigned numbers.
8. (x) Since floating numbers have fixed number of digits to represent exponent and fraction, the range of the magnitude of floating numbers is limited. Thus infinite number cannot be represented by IEEE Std 754 floating point numbers.
9. (x) As two floating point numbers are added, it is better to align two numbers by shifting the number with larger exponent such that two floating point numbers have the same exponent.
10. (x) The 32-bit MIPS CPU has 32 single-precision registers, where we also can group two of them as a single double-precision register.