3654

765321

1234876453

7464646464098234098209842083490238409283048283428342438

Computer/processor “on N bits”:

a). software perspective – the size of the memory word = the size of the (majority of) the registers (in our case = 32 bits)

b).engineering perspective – the size of the communication buses (channels) - ABUS, CBUS, DBUS

478+

585

The mp accepts ONLY BINARY OPERATIONS !!!!

Instr op1, op2, op3

CF – taken into account/relevant ONLY in case of addition and subtraction !!

0110 1101 + 1001 0011

Add, sub – where are IADD and ISUB ??? Where did they disappear ????

Mul, div, IMUL, IDIV

Addition and subtraction are VALID - UNDER BOTH INTERPRETATIONS SIMULTANEOUSLY !!!!

Addition – to be an unsigned operation I will consider CF as my overflow flag !!! CF = the overflow flag for UNSIGNED interpretation of my addition/subtraction !!!!

Addition – to be an signed operation I will consider OF as my overflow flag !!! OF = the overflow flag for SIGNED interpretation of my addition/subtraction !!!!

RAM (Random Access Memory) – who is RANDOM ?

* The access time at any given location from the RAM is THE SAME independently of the position (randomely far from the beginning of the memory…)
* In contrast from ROM (read only memories) a RAM supports/allows any number of R/W and in any ORDER (Randomely… reads and writes in a randomely order… The order in which R/W appear is RANDOM…)

Base 2 – 1…… 🡪 the 2 interpretations (SIGNED and UNSIGNED) will be ALWAYS DIFFERENT !!!!

Base 2 – 0…… 🡪 the 2 interpretations (SIGNED and UNSIGNED) will be IDENTICAL !!!!

Mov/add op1,op2 (b, w, d)

Op1 – m bits, op2 – n bits ---- result of op1\*op2 = m+n bits

Mul op1 // b\*b = w, w\*w = dw, dw\*dw = qw

0110 1100+ 6ch + c4h = 130h

1100 0100

1. 0011 0000 = 1 30h AF = 1

4 bits = 1 semioctet = 1 nibble = 1 HEXADECIMAL DIGIT !!!!!

10110110011 – representation (in base 2) of what I want as a human…

So, I do NEED transform it into base 10 !!!!!!!

UNSIGNED vs SIGNED – how can we REPRESENT them ?

The answer – develop 2’s complement representation !!!!!

REPRESENTATION (in base 2) vs. INTERPRETATION (in base 10) !!!!!!!!