Homework 4

№1

0x6c6c6337 = 0110 1100 0110 1100 0110 | 0011 0|011 0111 = lui x6, 0x6c6c6
opcode = 011 0111 = 55 = lui
rd = 0011 0 = 6
0x54830313 = 0101 0100 1000 | 0011 0|000 | 0011 0|001 0011 = addi x6, x6, 0x548
opcode = 001 0011 = 19 => I
funct3 = 000 => addi
rs1 = 0011 0 = 6
rd = 0011 0 = 6
0x412033b7 = 0100 0001 0010 0000 0011 | 0011 1|011 0111 = lui x7, 0x41203
opcode = lui
rd = 00111 = 7
01110010001
0xc6f38393 = 1100 0110 1111 | 0011 1|000 | 0011 1|001 0011 = addi x7, x7, -913
opcode = 0010011 = I
funct3 = 000 = addi
rs1 = 7
rd = 7
0x00535e37 = 0000 0000 0101 0011 0101 | 1110 0|011 0111 = lui x28, 0x00535
opcode = lui
rd = 28
0xf43e0e13 = 1111 0100 0011 | 1110 0|000 | 1110 0|001 0011 = addi x28, x28, -189
opcode = 0010011 = I
funct3 = 000 = addi
rs1 = 28
rd = 28
0x10010437 = 0001 0000 0000 0001 0000 | 0100 0|011 0111 = lui, x8, 0x10010
opcode = lui
rd = 8
0x00040413 = 0000 0000 0000 | 0100 0|000 | 0100 0|001 0011 = addi x8, x8, 0x000
opcode = I
funct3 = 000 = addi
rs1 = 8
rd = 8
0x00642023 = 0000 000|0 0110 | 0100 0|010 | 0000 0|010 0011 = sw x6, 0(x8)
opcode = 35 = S
funct3 = 010 = sw
rs2 = 6
rs1 = 8
0x00742223 = 0000 000|0 0111 | 0100 0|010 | 0010 0|010 0011 = sw x7, 4(x8)
opcode = 35 = S
funct3 = 010 = sw
rs2 = 7
rs1 = 8

0x01c42423 = 0000 000|1 1100 | 0100 0|010 | 0100 0|010 0011 = sw x28, 8(x8)
opcode = 35 = S
funct3 = 010 = sw
rs2 = 28
rs1 = 8
0x00400893 = 0000 0000 0100 | 0000 0|000 | 1000 1|001 0011 = addi x17, x0, 4
opcode = 19 = I
funct3 = 000 = addi
rs1 = 0
rd = 17
0x00800533 = 0000 000|0 1000 | 0000 0|000 | 0101 0|011 0011 = add x10, x0, x8
opcode = 51 = R
funct3 = 000
funct7 = 0000000 = add
rs2 = 8
rs1 = 0
rd = 10
0x00000073 = 0000 0000 0000 | 0000 0|000 | 0000 0|111 0011 = ecall
opcode = 115 = I
funct3 = 000
imm = 0 = ecall

№2

0x00500893 3 = 0000 0000 0101 0000 0000 1000 1001 0011 = addi x17, x0, 5
0x00000073 4 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall
0x00a00333 5 # store "a" = 0000 0000 1010 0000 0000 0011 0011 0011 = add x6, x0, x10
0x01f55293 6 # store sign of "a" = 0000 0001 1111 0101 0101 0010 1001 0011 =
srli x5, x10, 31
0x00000073 8 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall
0x00a00eb3 9 # store "b" = 0000 0000 1010 0000 0000 1110 1011 0011 =
add x29, x0, x10
0x01f55e13 10 # store sign of "b" = 0000 0001 1111 0101 0101 1110 0001 0011 =
srli x28, x10, 31
0x06030263 12 = 0000 0110 0000 0011 0000 0010 0110 0011 = beq x6, x0, 100
0x060e8063 13 = 0000 0110 0000 1110 1000 0000 0110 0011 = beq x29, x0, 96
0x00028663 15 # if "a" < 0 then inverse it = 0000 0000 0000 0010 1000 0110 0110 0011 =
beq x5, x0, 12
0xfff34313 16 = 1111 1111 1111 0011 0100 0011 0001 0011 = xori x6, x6, -1
0x00130313 17 = 0000 0000 0001 0011 0000 0011 0001 0011 = addi x6, x6, 1
0x000e0663 19 # if "b" < 0 then inverse it = 0000 0000 0000 1110 0000 0110 0110 0011
= beq x28, x0, 12
0xfffece93 20 = 1111 1111 1111 1110 1100 1110 1001 0011 = xori x29, x29, -1
0x001e8e93 21 = 0000 0000 0001 1110 1000 1110 1001 0011 = addi x29, x29, 1
0x01d35863 24 # if "a" < "b" swap them = 0000 0001 1101 0011 0101 1000 0110 0011 =
bge x6, x29, 16
0x006eceb3 25 = 0000 0000 0110 1110 1100 1110 1011 0011 = xor x29, x29, x6
0x006ec333 26 = 0000 0000 0110 1110 1100 0011 0011 0011 = xor x6, x29, x6

0x006eceb3 27 = 0000 0000 0110 1110 1100 1110 1011 0011 = xor x29, x29, x6
0x000003b3 29 = 0000 0000 0000 0000 0000 0011 1011 0011 = add x7, x0, x0
0x006383b3 31 = 0000 0000 0110 0011 1000 0011 1011 0011 = add x7, x7, x6
0xfffe8e93 32 = 1111 1111 1111 1110 1000 1110 1001 0011 = addi x29, x29, -1
0xffd04ce3 33 = 1111 1111 1101 0000 0100 1100 1110 0011 = blt x0, x29, -8
0x01c2cfb3 36 = 0000 0001 1100 0010 1100 1111 1011 0011 = xor x31, x5, x28
0x000f8663 37 = 0000 0000 0000 1111 1000 0110 0110 0011 = beq x31, x0, 12
0xfff3c393 38 = 1111 1111 1111 0011 1100 0011 1001 0011 = xori x7, x7, -1
0x00138393 39 # t2 - result accumulator = 0000 0000 0001 0011 1000 0011 1001 0011 = addi x7, x7, 1
0x00100893 41 = 0000 0000 0001 0000 0000 1000 1001 0011 = addi x17, x0, 1
0x00700533 42 = 0000 0000 0111 0000 0000 0101 0011 0011 = add x10, x0, x7
0x00000073 43 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall
0x00a00893 45 = 0000 0000 1010 0000 0000 1000 1001 0011 = addi x17, x0, 10
0x00000073 46 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall
0x00100893 49 # if sign of "a" and "b" is different then negate the result = 0000 0000 0001 0000 0000 1000 1001 0011 = addi x17, x0, 1
0x00000533 50 = 0000 0000 0000 0000 0000 0101 0011 0011 = add x10, x0, x0
0x00000073 51 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall
0x00a00893 52 = 0000 0000 1010 0000 0000 1000 1001 0011 = addi x17, x0, 10
0x00000073 53 = 0000 0000 0000 0000 0000 0000 0111 0011 = ecall

```
addi x17, x0, 5
ecall
add x6, x0, x10
srli x5, x10, 31
ecall
add x29, x0, x10
srli x28, x10, 31
beq x6, x0, l33
beq x29, x0, l33
beq x5, x0, l13
xori x6, x6, -1
addi x6, x6, 1
l13: beq x28, x0, l16
xori x29, x29, -1
addi x29, x29, 1
l16: bge x6, x29, l20
xor x29, x29, x6
xor x6, x29, x6
xor x29, x29, x6
l20: add x7, x0, x0
l21: add x7, x7, x6
addi x29, x29, -1
blt x0, x29, l21
xor x31, x5, x28
beq x31, x0, l28
```

```
xori x7, x7, -1
addi x7, x7, 1
l28: addi x17, x0, 1
add x10, x0, x7
ecall
addi x17, x0, 10
ecall
l33: addi x17, x0, 1
add x10, x0, x0
ecall
addi x17, x0, 10
ecall
```

это умножение(омг):

```
    addi a7, zero, 5
    ecall
    add t0, zero, a0

    addi a7, zero, 5
    ecall
    add t1, zero, a0

    mul t3, t0, t1

    add a0, zero, t3
    li a7, 1
    ecall
```