HW1

Problem 1

```
slli t0,x29,2
add t0, x10,t0
lw x1,0(t0)
addi x1, x1, -5

slli t1,x28,2
add t1,x10,t1
lw x2,0(t1)
sub x2,x2,x1
sw x2, 32(x11)
```

Problem 2

(a)

- It's R-type,since its opcode is 0110011
  - 0000000_00001_00001_000_00001_0110011
  - add x1, x1, x1

(b)

- Instruction type: I-type,since it's opcode is 0000011
- Assembly language instrunction: li x3, -5(x27)
  - opcode = 0x3=0000011
  - rd=3=00011
  - funct3=0x0=000
  - rs1=27=11001
  - imm=-5=111111111011
  - binary :111111111011_11011_000_00011_0000011
- the hexadecimal representation of the instruction: 0xffbd8183

Problem 3

(a)

- first loop:x6=9,x5=2, 9!=0
- second loop: x6=8,x5=4, 8!=0
- third loop: x6=7,x5=6,7!=0
- fourth loop: x6=6,x5=8,6!=0
- x6=5 ,x5=10, 5!=0
- x6=4, x5=12, 4!=0
- x6=3, x5=14, 3!=0
- x6=2, x5=16, 2!=0
- x6=1, x5=18, 1!=0
- x6=0, x5=20, 0=0, done
  Thus, the final value in register x5 is 20

(b)

```
#include <iostream>

int main(){
        int A = 0;
        int i= 10;
        while(i-->0){
        A + = 2;}
}
```

Problem4

```
f:
    addi sp, sp, -20
    sw ra,0(sp)
    sw a0,4(sp)
    sw a1,8(sp)
    sw a2,12(sp)
    sw a3,16(sp)

    lw a0, 4(sp)
    lw a1, 8(sp)
    jal  g

    lw a2, 12(sp)
    lw a3,16(sp)
    add a1,a2,a3
    jal g
```

```
    lw ra, 0(sp)
    addi sp, sp, 20
    ret

g:
    add a0,a0,a1
    ret
```