Homework4

Question1. You wish to pass three numbers into a function, according to AAPCS how would you pass the numbers?

- 这3个参数分别放在R0、R1和R2寄存器中

Question2. You wish to pass five numbers into a function, according to AAPCS how would you pass the numbers?

- 前面4个参数放在R0-3寄存器中第5个通过压栈传参

Question3. What do each of the following assembly directives do? Answer each line separately, not as one complete program.

```
AA  SPACE  10   ;AA 申请 10 bytes 空间
BB  RN  2       ;BB作为R2的标签,也就是用BB代替R2
CC  DCB 1,2,3   ;CC[]={1,2,3} CC大小为3 bytes
DD  DCB "Jon\n\r",0     ;DD[]={'J','o','n','\n','\r','\0'} 的字符串 大小为6 bytes
EE  DCW 1,2,3   ;EE[]{}={1,2,3} EE为 3个半字
FF  DCD 1,2,3   ;FF[]{}={1,2,3} FF为 3个字
GG  EQU 10      ;用GG作为10的标签, GG=10
```

Question 4.Create an array in RAM that can hold ten 32-bit unsigned numbers called Buf. Write an assembly and a C function that sets the value of each element to its index. This function has no formal input or output parameters, but does modify the Buf array

assembly

```
      AREA DATA, ALIGN=2
Buf   SPACE 40      ;空间为10个32位的数
      AREA |.text|,CODE,READONLY,ALIGN=2
Set   LDR  R1,=Buf  ;R1=Buf首地址
      MOV  R0,#0    ;i=0
Loop  STR  R0,[R1]  ;BUF[i]=i
      ADD  R1,#4    ;移到下一位
      ADD  R0,#1    ;i++
      CMP  R0,#10   ;比较 i与10
      BLO  Loop     ;i<10 继续
      BX   LR       ;跳出
```

C

```
uint32_t Buf[10];
void Set(void){
    uint32_t i;
    for(i=0;i<10;n++){
        Buf[i] = i;
    }
}
```

Question5. How many bits wide is the SysTick timer?

- 24 bits

Question6. Does SysTick count up or down?

- count down

Question7. Write a C function that uses SysTick to wait 100us.Assume the bus clock is running at 16 MHz.

(1599+1)*62.5ns = 100us.

```
void SysTick_100usWait(void){
  NVIC_ST_RELOAD_R = 1599;
  NVIC_ST_CURRENT_R = 0;
  while((NVIC_ST_CTRL_R&0x00010000)==0){
  }
}
```