Problem 1:

Write an ARM7 assembly program to find the greatest common divisor (GCD) of 2 integers, where the GCD is the largest positive integer that divides the numbers without a remainder. For example, the GCD of 8 and 12 is 4, the GCD of 54 and24 is 6. The below high level programming code is a simple way to find the greatest common divisor (GCD)of **a** and **b**.

```
int a = 54;
int b =24;
while(a != b)
{
        if(a>b)
          a=a-b;
        else
           b=b-a;
        }
```

Problem2:

Write an ARM7 assembly program that calculates the value of 2^3 given the high level programming language code below.

```
int a =1;
for (int i=0; i<3; i++)
{
        a*=2;
}
```

Problem3:

Write an ARM7 assembly program that sums up the numbers from 1to 10 starting from number 10, given the high level programming language code below.

```
int sum =0;
for (int i=10; i>0; i--)
{
        sum +=i;
}
```

Problem4:

Write an ARM7 assembly program to check a number in R0 is even or odd using AND instruction. If the number is even copy it into R2, if it is odd copy it in R3.

Problem 5:

The table below holds some logical operations that are not included in the ARM7 instruction set. How can these instructions be implemented using the available ARM7 instructions?

a.	ANDN R1, R2, R3	// bit-wise AND of R2 and !R3
b.	XNOR R1, R2, R3	// bit-wise exclusive-NOR

Problem 6:

Write an ARM7 assembly program that given the value 0xBD in register R1, it replaces the bits from bit 4 to bit 7 to be 0x5 instead of 0xB.

Note that in binary to replace bits by another value this is done in two steps:

1) Masking: this clears the unrequired bits (using AND operation)
2) Inserting: this inserts the required bits (using OR operation)

Problem 7:

Write an ARM7 assembly program that perform the following equation a = (b+ 4c) without using the MUL instruction. Assume that a, b and c are values in R0, R1, and R2 respectively.

Problem 8:

Write an ARM7 assembly program that perform the following equation A = B – C/8 without looping. Assume that A, B and C are values in R0, R1, and R2 respectively.

Problem 9:

Write an ARM7 assembly program that perform the following equation A = (B+ Cx2^D) without looping or using the MUL instruction. Assume that A, B, C and D are values in R0, R1, R2 and R3 respectively.

Problem 10:

If we set R0 to (0x00000022) and Rotate Right by 2, what will be the Result in hexadecimal?