German University in Cairo
Media Engineering and Technology

CSEN402 Computer Organization, Spring term 2020
Practice Assignment 8

Exercise 8-1

Write the assembly language program that is equivalent to the following IF statement C program

```
void main(){
int A, B, C;
if ((A–B)==0)
C = 1;
else
if ((A–B)<0)
C = 2;
else
C = 3;
}
```

Exercise 8-2

Given the following BC assembly program:

```
        ORG 100
        CLE
        CLA
        STA CTR
        LDA WRD
        SZA
        BUN ROT
        BUN STP
ROT,    CIL
        SZE
        BUN AGN
        BUN ROT
AGN,    CLE
        ISZ CTR
        SZA
        BUN ROT
STP,    HLT
CTR,    HEX 0
WRD,    HEX 62C1
        END
```

a) Explain in words what the following program accomplishes when it is executed. What is the value of location CTR when the compiler halts?

b) List the address symbol table obtained during the first pass of the assembler.

c) List the hexadecimal code of the translated program.

Exercise 8-3

Write a program loop, using a pointer and a counter that clears to 0 the contents of hexadecimal locations 500 through 5FF.

Exercise 8-4

Write a program for the arithmetic shift left position. Branch to OVF if an overflow occurs.

Exercise 8-5

Write an assembly language program to translate the following java program that calculates the average of 8 elements of an array a of positive integers, the program also specifies the minimum number and the maximum number. The program then creates another array b where for every element less than the average, its index in b should contain the value 0, and otherwise the value is 1.

```
void main ()
{
int a[8]= {5,10,7,9,20,30,3,4};
int b[8];
int sum =0;
int average =0;
int min= 32767;
int max =0;
int i;
//7FFF in hexadecimal
for (i=0; i<8; i++)
{
sum = sum + a[i];
if (a[i] < min)
min = a[i];
if (a[i]> max)
max = a[i];
}
average = sum /8;
for (i =0; i<8; i++)
{
if (a[i]<average)
b[i] = 0;
else
b[i] = 1;
}
}
```

Exercise 8-6

a) Write a program that evaluates the logic exclusive-OR of two logic operands.

b) Show the address symbol table for your solution