

La Trobe University
Department of Electronic Engineering
ELE22MIC - Microprocessors
Assignment 1
2005

1. Write down the object code for the following program.
Indicate the addressing mode for each instruction.

```
        ORG          $2000
atoiXD:
        PSHY
        PSHX
        LDX          #MyString
        LDD          #0
MoreChar:
        XGDY
        LDAB         0,X
        CMPB         #0
        BEQ          AllConverted
        SUBB         # $30
        CMPB         #9
        BLE          IsNumeric
IsAlphabetic:
        SUBB         #7
IsNumeric:
        ANDB         # $0F
        XGDY
        ASLD
        ASLD
        ASLD
        ASLD
        XGDY
        ABY
        XGDY
        INX
        JMP          MoreChar
AllConverted:
        XGDY
        PULX
        PULY
        STD          MyResult
        RTS
MyString  fcc  "9F"
          fcb  0
MyResult  rmb  2
```

2. Write an execution history of the program in Question 1.
In other words, show the values of all registers after each instruction has been executed, and describe any side effects and memory addresses read from or written to.

3. Write a program to clear the first 100 bytes of RAM (ie set them to zero), starting at memory location \$0000.

Key points:

Use CLR 0, X instruction - Indexed Addressing

DEX decrements the X register & sets the zero flag if $X = 0$

BEQ - Branch if Equal to Zero - i.e. Zero Flag is set

There are 100 bytes from 0..99 = 0..\$63 in hex.

4. Write 68HC11 assembly code for a software time-delay program that runs (delays) for 2 seconds.

Assume that the 68HC11 is using a 8-MHz clock, \Rightarrow 2MHz E clock \Rightarrow 0.5us per cycle.