

Appendices

Appendex-A :

Bascom code for microcontroller to control temperature

'in the name of allah al rahman al raheem

' Project Name : CortexM Do

' Auther Name : ABEER Abd Allah

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\$regfile = "m32def.dat"

\$crystal = 8000000

\$baud = 9600

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ConfigAdc = Single ,Prescaler = Auto , Reference = Avcc

ConfigPortc = Output

Portc = 0

Config Pinb.7 = Input

Portb.7 = 1

Dim Refresh As Bit

Dim Rx As Byte

Dim Tt1 As Word

Dim Tt2 As WordDim Tt3 As Word

Dim Tt4 As Word

Dim Ts1 As Word

Dim Ts2 As Word

Dim Ts3 As Word

Dim Ts4 As Word

Dim Err1 As Integer

Dim Err2 As Integer

Dim Err3 As Integer

Dim Err4 As Integer

Dim Mf1 As Word

Dim Mf2 As Word

Dim Mf3 As Word

Dim Mf4 As Word

Print "Steam Cooling System Will Strat Now ..."

Cls

Locate 1 , 1

Lcd "Steam Cooling System Will Strat Now ..."

Wait 1

Cls

Locate 4 , 5

Lcd "Intialaizing ..."

Locate 2 , 7

Lcd" WAIT "

Waitms 500

Locate 2 , 7

Lcd " "

Waitms 500

Locate 2 , 7

Lcd" WAIT "

Waitms 500

Locate 2 , 7

Lcd " "

Waitms 500

Locate 2 , 7

Lcd" WAIT "

Waitms 500

Locate 2 , 7

Lcd " "

Waitms 500

Ts1 = 408

Ts2 = 415

Ts3 = 462

Ts4 = 465


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Tt3 = Getadc(6)

Tt4 = Getadc(7)

Print ""

Print Tt1

Print Tt2

Loop

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Motor1_control:

Tt1 = Getadc(4)

Mf1 = Getadc(0)

Mf1 = Mf1 / 10

Locate 1 , 1

Lcd "1 T-" ; Tt1 ; " F-%" ; Mf1 ; " "

Err1 = Tt1 - Ts1

If Err1 >= 50 Then

    If Mf1 < 100 Then

        Portc.0 = 1

        Portc.1 = 0

        Locate 1 , 15

Lcd "O "

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    Locate 1 , 17
    Lcd "%100" ; " "
Elseif Mf1 >= 100 Then
    Portc.0 = 0
    Portc.1 = 0
    Locate 1 , 15

    Lcd "S "
    Locate 1 , 17
    Lcd "%100" ; " "
    End If

Elseif Err1 < 50 And Err1 > 0 Then

    If Mf1 > 25 Then
        Portc.1 = 1
        Portc.0 = 0
        Locate 1 , 15
        Lcd "C "
        Locate 1 , 17
        Lcd "%25" ; " "
    Elseif Mf1 < 25 Then

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    Portc.0 = 1

    Portc.1 = 0

    Locate 1 , 15

    Lcd "O "

    Locate 1 , 17

    Lcd "%25" ; " "

    Elseif Mf1 = 25 Then

        Portc.1 = 0

        Portc.0 = 0

        Locate 1 , 15

        Lcd "S "

        Locate 1 , 17

        Lcd "%25" ; " "

        End If

    Elseif Err1 < 0 Then

        If Mf1 > 0 Then

            Portc.1 = 1

            Portc.0 = 0

            Locate 1 , 15

            Lcd "C "

            Locate 1 , 17

```

Lcd "%00" ; " "

Elseif Mf1 = 0 Then

Portc.1 = 0

Portc.0 = 0

Locate 1 , 15

Lcd "S "

Locate 1 , 17

Lcd "%00" ; " "

End If

End If

Locate 2 , 17

Lcd "%100" ; " "

End If

Elseif Err2 < 50 And Err2 > 0 Then

If Mf2 > 25 Then

Portc.3 = 1

Portc.2 = 0

Locate 2 , 15

Lcd "C "

Locate 2 , 17

Lcd "%25" ; " "

Elseif Mf2 < 25 Then

Portc.2 = 1

Portc.3 = 0

Locate 2 , 15

Lcd "O "

Locate 2 , 17

Lcd "%25" ; " "

Elseif Mf2 = 25 Then

Portc.3 = 0

Portc.2 = 0

Locate 2 , 15

Lcd "S "

Locate 2 , 17

Lcd "%25" ; " "

End If

Elseif Err2 < 0 Then

If Mf2 > 0 Then

Portc.3 = 1

Portc.2 = 0

Locate 2 , 15

Lcd "C "

```

    Locate 2 , 17
    Lcd "%00" ; " "
    Elseif Mf2 = 0 Then
        Portc.3 = 0
        Portc.2 = 0
        Locate 2 , 15
        Lcd "S "
        Locate 2 , 17
        Lcd "%00" ; " "
        End If
    End If
    Return
Motor3_control:
    Tt3 = Getadc(6)

    Mf3 = Getadc(2)
    Mf3 = Mf3 / 10

    Locate 3 , 1
    Lcd "3 T-" ; Tt3 ; " F-%" ; Mf3 ; " "
    Err3 = Tt3 - Ts3
    If Err3 >= 50 Then

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If Mf3 < 100 Then

    Portc.4 = 1

    Portc.5 = 0

    Locate 3 , 15

    Lcd "O "

    Locate 3 , 17

    Lcd "%100" ; " "

Elseif Mf3 >= 100 Then

    Portc.4 = 0

    Portc.5 = 0

    Locate 3 , 15

    Lcd "S "

    Locate 3 , 17

    Lcd "%100" ; " "

    End If

Elseif Err3 < 50 And Err3 > 0 Then

    If Mf3 > 25 Then

        Portc.5 = 1

        Portc.4 = 0

        Locate 3 , 15

        Lcd "C "

```

Locate 3 , 17

Lcd "%25" ; " "

Elseif Mf3 < 25 Then

Portc.4 = 1

Portc.5 = 0

Locate 3 , 15

Lcd "O "

Locate 3 , 17

Lcd "%25" ; " "

Elseif Mf3 = 25 Then

Portc.5 = 0

Portc.4 = 0

Locate 3 , 15

Lcd "S "

Locate 3 , 17

Lcd "%25" ; " "

End If

Elseif Err3 < 0 Then

If Mf3 > 0 Then

Portc.5 = 1

Portc.4 = 0

```

    Locate 3 , 15
Lcd "C "

    Locate 3 , 17
Lcd "%00" ; " "

Elseif Mf3 = 0 Then

    Portc.5 = 0

    Portc.4 = 0

    Locate 3 , 15
Lcd "S "

    Locate 3 , 17
Lcd "%00" ; " "

    End If

End If

Return

Motor4_control:

Tt4 = Getadc(7)

Mf4 = Getadc(3)

Mf4 = Mf4 / 10

Locate 4 , 1

Lcd "4 T-" ; Tt4 ; " F-" ; Mf4 ; " "

Err4 = Tt4 - Ts4

```

If Err4 >= 50 Then

 If Mf4 < 100 Then

 Portc.6 = 1

 Portc.7 = 0

 Locate 4 , 15

 Lcd "O "

 Locate 4 , 17

 Lcd "%100" ; " "

 Elseif Mf4 >= 100 Then

 Portc.6 = 0

 Portc.7 = 0

 Locate 4 , 15

 Lcd "S "

 Locate 4 , 17

 Lcd "%100" ; " "

 End If

 Elseif Err4 < 50 And Err4 > 0 Then

 If Mf4 > 25 Then

 Portc.7 = 1

 Portc.6 = 0

 Locate 4 , 15

 Lcd "C "

```

    Locate 4 , 17
    Lcd "%25" ; " "
    Elseif Mf4 < 25 Then
        Portc.6 = 1
        Portc.7 = 0
        Locate 4 , 15
        Lcd "O "
        Locate 4 , 17
        Lcd "%25" ; " "
    Elseif Mf4 = 25 Then
        Portc.7 = 0
        Portc.6 = 0
        Locate 4 , 15
        Lcd "S "
        Locate 4 , 17
        Lcd "%25" ; " "
    End If
    Elseif Err4 < 0 Then
        If Mf4 > 0 Then
            Portc.7 = 1
            Portc.6 = 0

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    Locate 4 , 15
Lcd "C "

    Locate 4 , 17
Lcd "%00" ; " "

Elseif Mf4 = 0 Then

    Portc.7 = 0

    Portc.6 = 0

    Locate 4 , 15
Lcd "S "

    Locate 4 , 17
Lcd "%00" ; " "

    End If

End If

Return

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End

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