```
1
2
3   RS EQU P2.7           ; RS is equated to P2.7
4   RW EQU P2.6           ; RW is equated to P2.6
5   EN EQU P2.5           ; EN is equated to P2.5
6   ORG 0000H
7   ACALL INIT            ;INIT subroutine is to initialize the LCD
8   ACALL TEXT1
9   ACALL LINE2
10  MOV DPTR,#LUT
11  MOV P1,#00000000B
12  MOV P0,#00000000B
13
14  MAIN:MOV R6,#230D
15       SETB P3.5
16  MOV TMOD,#01100001B  ;(g  c/~(t) M0 M1) (G C/T~ MO M1)   =  0 1 1 0 0 0 0 1
17  MOV TL1,#00000000B
18  MOV TH1,#00000000B
19  SETB TR1
20
21  BACK: MOV TH0,#00000000B    ;Timer 0 is used as timer for total of 65536uS
22  MOV TL0,#00000000B
23  SETB TR0
24  HERE: JNB TF0,HERE
25  CLR TR0
26  CLR TF0
27  DJNZ R6,BACK
28  CLR TR1
29  CLR TF0
30  CLR TF1
31  MOV A,TL1
32  MOV B,#4D
33  MUL AB
34  ACALL SPLIT
35  ACALL INIT
36  ACALL TEXT1
37  ACALL LINE2
38  ACALL TEXT2
39  ACALL BPM
40
41  SJMP MAIN
42  INIT:
43   acall DELAY
44   mov a,#38h      ;to initialise lcd in 8-bit mode
45   acall CMD  ; call command subroutine
46   mov a,#0Eh      ;to turn ON display, cursor blinking
47   acall CMD  ;call command subroutine
48   mov a,#01h      ;to clear display
49   acall CMD  ;call command subroutine
50   mov a,#06h      ;to shift the cursor to  left
51   acall CMD   ;call command subroutine
52   mov a,#80h      ;to displsy content on LCD from line 1
53   acall CMD  ;call command subroutine
54
55
56
57  TEXT1:
58   mov a,#'H'
59   acall DISPLAY
60   mov a,#'e'
61   acall DISPLAY
62   mov a,#'a'
63   acall DISPLAY
64   mov a,#'r'
65   acall DISPLAY
66   mov a,#'t'
67   acall DISPLAY
68   mov a,#' '
69   acall DISPLAY
70   mov a,#'R'
71   acall DISPLAY
72    mov a,#'a'
```

```
 73     acall DISPLAY
 74      mov a,#'t'
 75     acall DISPLAY
 76      mov a,#'e'
 77     acall DISPLAY
 78    RET
 79
 80    LINE2:
 81    MOV A,#0C0H
 82    ACALL CMD
 83    RET
 84    TEXT2:
 85    MOV A,#'b'
 86    ACALL DISPLAY
 87    MOV A,#'p'
 88    ACALL DISPLAY
 89    MOV A,#'m'
 90    ACALL DISPLAY
 91    MOV A,#' '
 92    ACALL DISPLAY
 93    RET
 94
 95
 96
 97    BPM:
 98    MOV A,R1
 99    ACALL ASCII
100    ACALL DISPLAY
101    MOV A,R2
102    ACALL ASCII
103    ACALL DISPLAY
104    MOV A,R3
105    ACALL ASCII
106    ACALL DISPLAY
107    RET
108
109    CMD: MOV P0,A
110    CLR RS
111    CLR RW
112    SETB EN
113    ACALL DELAY
114    CLR EN
115    RET
116
117    DISPLAY:MOV P0,A
118    SETB RS
119    CLR RW
120    SETB EN
121    ACALL DELAY
122    CLR EN
123    RET
124
125    DELAY: mov r2,#7
126    L4:mov r0,#255
127    L3:mov r1,#255
128    L2:djnz r1,L2
129       djnz r0,L3
130       djnz r2,L4
131       ret
132
133    CLR EN
134    CLR RW
135    RET
136
137    DELAY1:MOV R5,#255D
138    HERE2:DJNZ R5,HERE2
139    RET
140
141    SPLIT: MOV B,#10D
142    DIV AB
143    MOV R3,B
144    MOV B,#10D
```

```
145   DIV AB
146   MOV R2,B
147   MOV R1,A
148   RET
149
150   ASCII: MOVC A,@A+DPTR
151   RET
152   LUT: DB 48D
153   DB 49D
154   DB 50D
155   DB 51D
156   DB 52D
157   DB 53D
158   DB 54D
159   DB 55D
160   DB 56D
161   DB 57D
162
163   END
164
165
166
167
```