```
#include <stdio.h>
#include <pic.h>
#include<string.h>
#define PORTBIT(adr,bit)((unsinged)(&adr)*8+(bit))
#define Read_write RD6
#define Enable RD7
#define Data_comm RD5
#define BAUD 9600
#define FOSC 20000000L
#define DIVIDER ((int)(FOSC/(16UL * BAUD) -1))
#define NINE_BITS 0x00
#define SPEED 0x4
#define RX_PIN TRISC7
#define TX_PIN TRISC6

/* Serial initialization */
void init_comms(void);
void putch(unsigned char);
unsigned char get_ch(void);
unsigned char getche(void);
void init_disp(void);
void delay_us(void);
void delay_ms(void);
void command(unsigned char byte);
void data(unsigned char byte);
void main(void)
{
  unsigned char msg[]="AT";
  unsigned char msg_rec,string[]={0};
  int disp=0,m=0,k=0,l=0;
  init_comms();           // set up the USART - settings defined in usart.h
  TRISD=0x00;
  PORTD=0x00;
  TRISB=0x00;
  PORTB=0x00;
  init_disp();
  command(0x81);
  while(msg[k]!='\0')
  {
    putch(msg[k]);
    k+=1;
    }
   delay_ms();
    putch('\r');
    putch('\n');
while(1)
```

```
{
   msg_rec=get_ch();
   data(msg_rec);
   string[m]=msg_rec;
   //delay_ms();
  msg_rec=0;
   }
}

void putch(unsigned char c)
{
        /* output one byte */
while(!TXIF)                    //set when register is empty
continue;
        TXREG=c;
 //delay_us();
}

unsigned char get_ch()
{
        /* retrieve one byte */
        while(!RCIF)            continue;
//      putch(RCREG);
   return RCREG;

}
unsigned char getche(void)
{
        unsigned char c;
        putch(c = get_ch());
        return c;
}
void init_comms(void)
{
   RX_PIN = 1;
        TX_PIN = 1;
        SPBRG = DIVIDER;
        RCSTA =(NINE_BITS|0x90);
        TXSTA =(SPEED|NINE_BITS|0x20);//0b01000101;//

}

        void delay_us(void)
{
         int j,i;
         for(j=0;j<10;j++)
```

```
            {
              for(i=0;i<50;i++)
            {}
    }

}
void init_disp(void)
{
 command(0x38); // Initializes 2 lines and 5X7 matrix
command(0x01); //CLear screen
command(0x06); //CLear screen
command(0x0E); //Cursor blinking
}
void data(unsigned char byte)
  {
          PORTB=byte;
          Data_comm=1;
          Read_write=0;
   Enable=1;
          Enable=0;
          delay_ms();
   }
void command(unsigned char byte)
{
 PORTB=byte;
 Data_comm=0;
 Read_write=0;
 Enable=1;
 Enable=0;
 delay_ms();
}
void delay_ms(void)
{
           int j,i;
           for(j=0;j<100;j++)
           {
             for(i=0;i<90;i++)
           {}
    }

}
```