EE4144 DEBUGGING AND GPIO PROBLEMS

4.1 Practice compile-time debugging by fixing all of the syntax errors in the following listing. Do yourself a favor and work through all the bugs using the Arduino IDE compile output information.Turn in the source code listing of your debugged program. Clearly state all of the syntax errors that you found.

```
void MyDelay (unsigned long mSecondsApx );
void setup ()
{
unsigned char * portDDRB ;
portDDRB = (unsigned char *) 0x24;
*portDDRB |= Ox2O;
}
void loop ()
{
unsigned char * portB ;
portB = (unsigned char *) 0x25;
*portB |= Ox2O;
MyDelay {1000}
*portB &= OxDF:
MyDelay [1000] ,
}
void MyDelay (unsigned long mSecondsApx )
{
volatile unsigned long i;
unsigned long endTime = 1000 * mSecondsApx ;
for (i = 0; i < endTime ; i++);
}
```

4.2 Practice run-time debugging by fixing the following listing, so that the LED will blink like it was meant to. Note: you should be able to do this with two minor changes.

```
void NewDelay (unsigned char mSecondsApx );
void setup ()
  {
        unsigned char * portDDRB ;
        portDDRB = (unsigned char *) 0x24;
        *portDDRB |= 0x20;
  }
void loop ()
 {
        unsigned char * portB ;
        portB = (unsigned char *) 0x25;
        *portB |= 0x20;
        NewDelay (100);
        *portB &= 0xDF;
        NewDelay (100);
  }
```

```
void NewDelay (unsigned char mSecondsApx )
 {
        volatile unsigned char i;
        unsigned long endTime = 1000 * mSecondsApx ;
        for (i = 0; i < endTime ; i++);
  }
```

4.3 Explain why the original program in problem 4.2 was not working, and what you did to fix it.

4.4 Practice run-time debugging by fixing the following listing, so that the LED will blink like it was meant to.

```
void NewDelay (unsigned long mSecondsApx );
void setup ()
 {
        unsigned char * portDDRB ;
        portDDRB = (unsigned char *) 0x24;
        *portDDRB |= 0x20;
  }
void loop ()
  {
        unsigned char * portB ;
        portB = (unsigned char *) 0x25;
        *portB |= 0x20;
        NewDelay (100);
        *portB &= 0xDF;
        NewDelay (100);
  }
void NewDelay (unsigned long mSecondsApx )
  {
        volatile unsigned long i;
        unsigned char j;
        unsigned long k;
        unsigned long endTime = 100 * mSecondsApx ;
        for (i = 0; i < endTime ; i++)
        {
          j = 10;
          do
          {
                j = j - 1;
                k = i / j;
           } while (k > 0);
        }
    }
```

4.5 Explain why the original program in problem 4.4 was not working, and what you did to fix it.

4.6 Practice run-time debugging by fixing the following listing, so that the LED will blink like it was meant to.

```
void NewDelay (unsigned long mSecondsApx );
void setup ()
{
        unsigned char * portDDRB ;
        portDDRB = (unsigned char *) 0x24;
        *portDDRB |= 0x20;
}
void loop ()
{
        unsigned char * portB ;
        portB = (unsigned char *) 0x25;
        *portB |= 0x20;
        NewDelay (100);
        *portB &= 0xDF;
        NewDelay (100);
}
void NewDelay (unsigned long mSecondsApx )
{
        volatile unsigned long i;
        unsigned char j = 0;
        unsigned long endTime = 100 * mSecondsApx ;
        i = 0;
        while (j = 0)
        {
          i++;
          if (i = endTime )
          {
           j = 1;
     }
    }
}
```

4.7 Explain why the original program in problem 4.6 was not working, and what you did to fix it.