**Exercise**

Write a C# application to model a classic producer / consumer problem.  The application should create 5 producers (letter writers) which place their letters into a queue.  A "mailman", the consumer, reads from the queue and delivers the letters to the correct mailbox.  There are 10 mailboxes and the routing of the letters is done using the hashcode of the Address.  The skeleton of the Letter class is given below.

The letter writers each have a name and this name is included in their letters.  Combined the writers should write at least 10 but no more than 15 letters per minute.  Every writer must write at least one letter per minute.  The letters must be time stamped with both the time the letter is placed in the queue (SendTime) and the time it is delivered to the correct destination mailbox (ReceiveTime).

The application should be thread safe and should seek to minimize the delivery time (ReceiveTime - SendTime).

        public class Letter

        {

            public static readonly string MillisecondTimeFormat = "HH:mm:ss.fff";

            public string SenderName { get; set; }

            public string Address { get; private set; }

            public DateTime SendTime { get; set; }

            public DateTime ReceiveTime { get; set; }

            public Letter(string senderName) : this() {

                SenderName = senderName;

            }

            public Letter()

            {

                Address = DateTime.Now.ToString(MillisecondTimeFormat);

            }

            public TimeSpan GetDeliveryTime() {

                return ReceiveTime - SendTime;

            }

        }