Let's number the two exercises that you did in the last tutorial, Examples 78 and 79.

- **Example 80.** Prove the following algorithm is correct

  \begin{algorithm}
  \textbf{Factorial}(n)
  \begin{algorithmic}
  \State \textbf{precondition:} \( n \in \mathbb{N} \)
  \State \textbf{postcondition:} Return \( n! \)
  \end{algorithmic}
  \begin{algorithmic}
  \State \( i = 1 \)
  \State factorial = 1
  \While \( i < n \)
  \State \( i = i + 1 \)
  \State \( f = f \times i \)
  \EndWhile
  \State \textbf{return} \( f \)
  \end{algorithm}
  
- **Example 81.** Prove the following algorithm is correct

  \begin{algorithm}
  \textbf{Division}(A, B)
  \begin{algorithmic}
  \State \textbf{precondition:} \( A, B > 0 \in \mathbb{N} \)
  \State \textbf{postcondition:} Return \( q \) and \( r \) where \( A=Bq+r \) and \( r<B \)
  \end{algorithmic}
  \begin{algorithmic}
  \State \( r = A \)
  \State \( q = 0 \)
  \While \( r \geq B \)
  \State \( r = r - B \)
  \State \( q = q + 1 \)
  \EndWhile
  \State \textbf{return} \( q, r \)
  \end{algorithm}
  
- **Example 82.** Prove the following algorithm is correct

  \begin{algorithm}
  \textbf{LeastCommonMultiple}(A, B)
  \begin{algorithmic}
  \State \textbf{precondition:} ?
  \State \textbf{postcondition:} ?
  \end{algorithmic}
  \begin{algorithmic}
  \State \( p = A \)
  \State \( q = B \)
  \While \( p \neq q \)
  \If \( p < q \): \( p = p + A \)
  \Else: \( q = q + B \)
  \EndIf
  \EndWhile
  \State \textbf{return} \( p \)
  \end{algorithm}

We do not intend to publish solutions (or solutions outline) for any of the questions of the course notes, or extra practices. You are more than welcome to discuss your solutions with us.