CS1021 Tutorial 3

Q1 Translate each of the following pseudo-code statements into a sequence of ARM assembly language instructions. Assume that \( x \) and \( y \) are signed integers and that \( x \) is in R1 and \( y \) in R2.

(i) if \((x== 0)\)
   \[
   x = x + 5;
   \]

(ii) if \((x >= 5)\)
    \[
    x = 0;
    \]

(iii) \[
\begin{align*}
  x &= 10; \\
  y &= 5; \\
  &\text{while } (x > 0) \\ &\quad \{ \\ &\quad \quad y = y*x; \\ &\quad \quad x = x - 1; \\ &\quad \} \\
\end{align*}
\]

(iv) if \((x < 9)\)
    \[
    x = x + 1;
    \]
    else 
    \[
    x = 0;
    \]

(v) if \((x > 9)\)
    \[
    x = 0;
    \]
    if \((y > 9)\)
    \[
    y = 0
    \]
    else 
    \[
    y = y + 1;
    \]
    else 
    \[
    x = x + 1;
    \]

Q2 Write an ARM assembly language program to compute \(x^y\). Assume \(x\) and \(y\) are unsigned integers and that \(x\) is in R1, \(y\) in R2 and the result is stored in R0.