Prerequisites:

At first we must recall 3 of the following summation formulas:

- $\sum_{i=1}^{n} (i) = \frac{n(n+1)}{2}$
- $\sum_{i=1}^{n} (ci) = c \sum_{i=1}^{n} (i)$
- $\sum_{i=1}^{n} (i^2) = \frac{n(n+1)(2n+1)}{6}$

Solution:

Now let us evaluate the expression:

$$
\begin{aligned}
\sum_{i=1}^{n} i(n - i + 1) &= \sum_{i=1}^{n} (in - i^2 + i) \\
&= n \sum_{i=1}^{n} (i) - \sum_{i=1}^{n} (i^2) + \sum_{i=1}^{n} (i) \\
&= (n + 1) \sum_{i=1}^{n} (i) - \sum_{i=1}^{n} (i^2) \\
&= \frac{n(n+1)(n+1)}{2} - \frac{n(n+1)(2n+1)}{6} \\
&= n(n + 1)(\frac{n+2}{6})
\end{aligned}
$$

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