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7. (a) step 2: $n-1$ step 3-5: $\sum_{i=2}^{n-1}\left(\sum_{j=i+1}^{n} 2\right) + \sum_{j=i+1}^{n}\sum_{k=1}^{i-1} 2 = \frac{1}{3}n^3 - \frac{7}{3}n + 2$

step 6: $n-1$ $\therefore A = 2n-2+\frac{1}{3}n^3-\frac{7}{3}n+2 = \frac{1}{3}n^3-\frac{1}{3}n$

step 3-5: $\sum_{i=2}^{n-1}\left(\sum_{k=1}^{i-1} 1 + \sum_{j=i+1}^{n}\sum_{k=1}^{i-1} 2\right) = \frac{n^3}{3} - \frac{n^2}{2} - \frac{5}{6}n + 1$

step 6: $n-1$ $\therefore B = \frac{n^3}{3} - \frac{n^2}{2} + \frac{1}{6}n$

(b) $y_1 = \frac{b_1}{l_{11}} = b_1$.

$y_i = \frac{1}{l_{ii}}\left[b_i - \sum_{j=1}^{i-1} l_{ij}y_j\right]$

$\therefore$ multiplications/divisions: $\sum_{i=2}^{n}\sum_{j=1}^{i-1} 1 = \frac{1}{2}n^2 - \frac{1}{2}n$

additions/subtractions: $\sum_{i=2}^{n}\left[\sum_{j=1}^{i-1} 1 - 1 + 1\right] = \frac{1}{2}n^2 - \frac{1}{2}n$

(c)

	multiplications/divisions	additions/subtractions
factoring $A=LU$	$\frac{1}{3}n^3-\frac{1}{3}n$	$\frac{1}{3}n^3-\frac{1}{2}n^2+\frac{1}{6}n$
$Ly=b$	$\frac{1}{2}n^2-\frac{1}{2}n$	$\frac{1}{2}n^2-\frac{1}{2}n$
$Ux=y$	$\frac{1}{2}n^2+\frac{1}{2}n$	$\frac{1}{2}n^2-\frac{1}{2}n$
Total	$\frac{1}{3}n^3+n^2-\frac{1}{3}n$	$\frac{1}{3}n^3+\frac{1}{2}n^2-\frac{5}{6}n$

(d)

	multiplications/division	additions/subtractions
factoring $A=LU$.	$\frac{1}{3}n^3-\frac{1}{3}n$	$\frac{1}{3}n^3-\frac{1}{2}n^2+\frac{1}{6}n$
$Ly^{(k)}=b^{(k)}$	$(\frac{1}{2}n^3-\frac{1}{2}n)m$	$(\frac{1}{2}n^2-\frac{1}{2}n)m$
$Ux^{(k)}=y^{(k)}$	$(\frac{1}{2}n^2+\frac{1}{2}n)m$	$(\frac{1}{2}n^2-\frac{1}{2}n)m$
	$\frac{1}{3}n^3+mn^2-\frac{1}{3}n$	$\frac{1}{3}n^3+(m-\frac{1}{2})n^2-(m-\frac{1}{6})n$