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2.2-1 - Express the function $\frac{n^3}{1000} - 100n^2 - 100n + 3$ in terms of Θ notation.

$\Theta(n^3)$

2.2-2' - Write pseudocode for Selection Sort.

```
Selection Sort(A):
 1  for cur = 0 to A.length:
 2      small = A[cur]
 3      index = cur
 4      for k = cur + 1 to A.length:
 5          if A[k] < small:
 6              small = A[k]
 7              index = k
 8      temp = A[cur]                    // Swap the values
 9      A[cur] = small
10      A[index] = temp
```

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2.3-3 - Use mathematical induction to show that when n is an exact power of 2, the solution of the recurrance

$$T(n) = \begin{cases} 2 & \textbf{if } n = 2 \\ 2T(\frac{n}{2}) + n & \textbf{if } n = 2^k \textbf{ for } k > 1 \end{cases}$$

is $T(n) = n \log n$.