



Name-Surname:

25.12.2014

ID Number:

CLASSWORK 9

Find the asymptotic complexity (Θ class) of the following algorithm:

INPUT: integer n

$S = 0$

For $i = 1$ to n

 For $j = 1$ to $5 * i$

$S = S + 1$

 EndFor

EndFor

Return S

Answer:

Number of operations:

$$5 + 10 + 15 + \dots + 5n = \frac{5n(n+1)}{2}$$

$$\Rightarrow \Theta(n^2)$$



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CLASSWORK 9

Find the asymptotic complexity (Θ class) of the following algorithm:

INPUT: integer n

$S = 0$

For $i = 1$ to n

 For $j = 1$ to $\lceil i/2 \rceil$

$S = S + 1$

 EndFor

EndFor

Return S

Answer:

Number of operations:

$$1 + 1 + 2 + 2 + \dots + \frac{n}{2} + \frac{n}{2} = 2 \left(1 + 2 + \dots + \frac{n}{2} \right) = \frac{n^2}{4} + \frac{n}{2}$$

$$\Rightarrow \Theta(n^2)$$