

## Çankaya University Department of Computer Engineering

CENG 277 - Discrete Structures

Name-Surname: 25.12.2014

ID Number:

### CLASSWORK 9

Find the asymptotic complexity ( $\Theta$  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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Find the asymptotic complexity ( $\Theta$  class) of the following algorithm:

INPUT: integer n S=0For i=1 to nFor j=1 to  $\lceil i/2 \rceil$  S=S+1EndFor EndFor Return S

#### Answer:

Number of operations:

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

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