

BSc (Hons) in Information Technology

Year 2

Data Structures and Algorithms – IT2070

Lab Exercise 7 – Insertion Sort

Question

- Write a program to read a set of numbers (between 10 to 20) from the keyboard and store them in an array.
- Sort the numbers in ascending order with the Insertion sorting algorithm.
- Calculate how many times it executes the while of the algorithm.

INSERTION-SORT(<i>A</i>)	<i>cost</i>	<i>times</i>
for $j \leftarrow 2$ to n	c_1	n
do $key \leftarrow A[j]$	c_2	$n - 1$
▷ Insert $A[j]$ into the sorted sequence $A[1 \dots j - 1]$.	0	$n - 1$
$i \leftarrow j - 1$	c_4	$n - 1$
while $i > 0$ and $A[i] > key$	c_5	$\sum_{j=2}^n t_j$
do $A[i + 1] \leftarrow A[i]$	c_6	$\sum_{j=2}^n (t_j - 1)$
$i \leftarrow i - 1$	c_7	$\sum_{j=2}^n (t_j - 1)$
$A[i + 1] \leftarrow key$	c_8	$n - 1$