



Fecha: 27 de junio de 2023

COMISIÓN DE SELECCIÓN DE PROGRAMADORES

Convocatoria pública de 7 de junio de 2022 para la provisión de catorce plazas vacantes de Programador con destino en la Dirección de de Tecnologías de la Información y de las Comunicaciones de la Secretaría General del Congreso de los Diputados.

Cuarto Ejercicio

Nombre:	Firma:
Apellidos:	
DNI:	

Instrucciones:

1. No abra este cuestionario hasta que le sea indicado.
2. No escriba ni haga ninguna marca o alteración de los códigos de barras impresos en cada hoja del cuestionario.
3. El enunciado del ejercicio consta de una única página.
4. El tiempo de realización de este ejercicio es de **45 minutos**.
5. Rellene todos los datos de la portada y entréguela cuando se le solicite, antes de comenzar la realización del ejercicio.
6. Puede utilizar todas las hojas en blanco que considere necesario para la realización del ejercicio. Ponga en cada una de ellas el número de orden.
7. Al finalizar el ejercicio, deberá entregar las hojas de respuestas y el enunciado del ejercicio, los cuales serán grapados entre sí y guardados en un sobre cerrado.

2 Sorting

2.1 Introduction

The primary purpose of this chapter is to provide an extensive set of examples illustrating the use of the data structures introduced in the preceding chapter and to show how the choice of structure for the underlying data profoundly influences the algorithms that perform a given task. Sorting is also a good example to show that such a task may be performed according to many different algorithms, each one having certain advantages and disadvantages that have to be weighted against each other in the light of the particular application.

Sorting is generally understood to be the process of re-arranging a given set of objects in a specific *order*. The purpose of sorting is to facilitate the later search for members of the sorted set. As such it is an almost universally performed, fundamental activity. Objects are sorted in telephone books, in income tax files, in tables of contents, in libraries, in dictionaries, in warehouses, and almost everywhere that stored objects have to be searched and retrieved. Even small children are taught to put their things "in order," and they are confronted with some sort of sorting long before they learn anything about arithmetic.

Hence, sorting is a relevant and essential activity, particularly in data processing. What else would be easier to sort than "data"! Nevertheless, our primary interest in sorting is devoted to the even more fundamental techniques used in the construction of algorithms. There are not many techniques that do not occur somewhere in connection with sorting algorithms. In particular, sorting is an ideal subject to demonstrate a great diversity of algorithms, all having the same purpose, many of them being optimal in some sense, and most of them having advantages over others. It is therefore an ideal subject to demonstrate the necessity of performance analysis of algorithms. The example of sorting is moreover well-suited for showing how a very significant gain in performance may be obtained by the development of sophisticated algorithms when obvious methods are readily available.