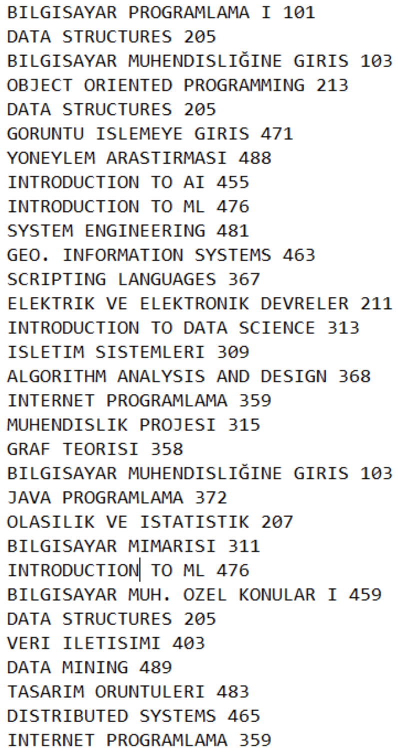
11.12.2021

CENG205 DATA STRUCTURES

ASSIGNMENT 2

1) Sort the records (according to **course codes**) in the "Data.dat" file **ascendingly**, which contains the course name and course code information about Gazi University Computer Engineering Department courses (see Figure 1). A ***linked list*** must be used to store records in order in memory. A linked list data structure should be created and all records (except **duplicate** records) in the file should be added to this linked list sequentially. Duplicate records in the file should be added to the linked list only **once**. After the records in the file are read, they will be printed sequentially both on the screen and in the "Sorted.dat" file. While printing the sorted course data, course codes must be printed before course names with a **tab character** separating them (see Figure 2). There should be no duplicate records in the "Sorted.dat" file.

!!! Solutions made using array will not be evaluated!!!



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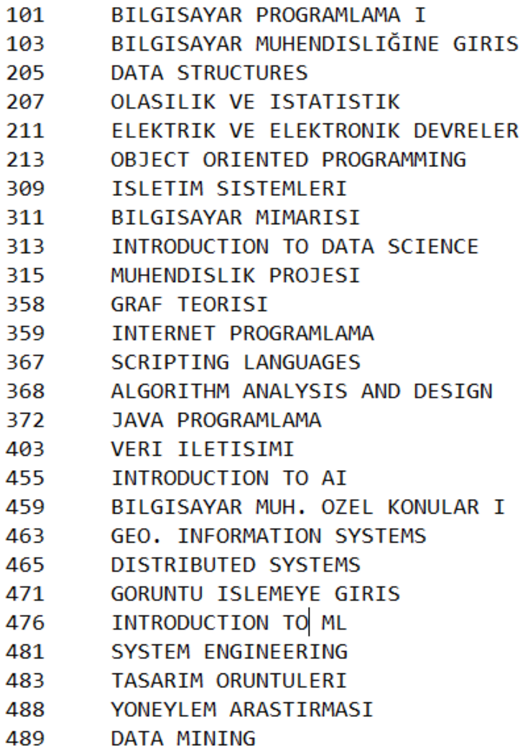
BILGISAYAR PROGRAMLAMA I 101
DATA STRUCTURES 205
BILGISAYAR MUHENDISLIĞINE GIRIS 103
OBJECT ORIENTED PROGRAMMING 213
DATA STRUCTURES 205
GORUNTU ISLEMEYE GIRIS 471
YONEYLEM ARASTIRMASI 488
INTRODUCTION TO AI 455
INTRODUCTION TO ML 476
SYSTEM ENGINEERING 481
GEO. INFORMATION SYSTEMS 463
SCRIPTING LANGUAGES 367
ELEKTRIK VE ELEKTRONIK DEVRELER 211
INTRODUCTION TO DATA SCIENCE 313
ISLETIM SISTEMLERI 309
ALGORITHM ANALYSIS AND DESIGN 368
INTERNET PROGRAMLAMA 359
MUHENDISLIK PROJESI 315
GRAF TEORISI 358
BILGISAYAR MUHENDISLIĞINE GIRIS 103
JAVA PROGRAMLAMA 372
OLASILIK VE ISTATISTIK 207
BILGISAYAR MIMARISI 311
INTRODUCTION TO ML 476
BILGISAYAR MUH. OZEL KONULAR I 459
DATA STRUCTURES 205
VERI ILETISIMI 403
DATA MINING 489
TASARIM ORUNTULERI 483
DISTRIBUTED SYSTEMS 465
INTERNET PROGRAMLAMA 359
```

Figure 1. “Data.dat” file contents



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101     BILGISAYAR PROGRAMLAMA I
103     BILGISAYAR MUHENDISLIĞINE GIRIS
205     DATA STRUCTURES
207     OLASILIK VE ISTATISTIK
211     ELEKTRIK VE ELEKTRONIK DEVRELER
213     OBJECT ORIENTED PROGRAMMING
309     ISLETIM SISTEMLERI
311     BILGISAYAR MIMARISI
313     INTRODUCTION TO DATA SCIENCE
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463     GEO. INFORMATION SYSTEMS
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483     TASARIM ORUNTULERI
488     YONEYLEM ARASTIRMASI
489     DATA MINING
```

Figure 2. The expected “Sorted.dat” file contents

Useful Information:

In order to process the files:

- Defining a file pointer: FILE *file_pointer_name;

  Example: FILE *fileptr;

- Opening the file in the appropriate mode: fopen ("name of the file" , "mode");

  file_pointer_name = fopen ("name of the file" , "mode");

Table 1. mode and meaning

Mode	Meaning
w	• Opens the text file in write mode. • If the file does not exist, it is created, if there is, the records in the file are deleted and opened again.
r	• Opens the text file in read mode. • The file must already exist.
a	• The text opens the file in insert mode. • Newly entered records are written at the end of the file. The file does not need to exist before.

Example: FILE *fileptr;

fileptr = fopen ("Data.dat", "r");

- Reading from or writing to file: fprintf / fscanf (stream, "format_text", list of variables);

  Example: fprintf (fileptr, "%d", course_code);

  fscanf (fileptr, "%d", &course_code);

- Closing the file: fclose (file_pointer);