CSE 202: Fundamentals of Database Systems
Winter 2019
Assignment 1
Due Date: 24-01-2019 (No extension will be allowed)

Instructions:

- Write the programs in Java.
- The naming convention for the files: filename_rollnumber. extension like program1_2016002.java
- **The assignment can be done in groups of maximum 2 students.**
- **Compress all the input/output files along with the programs as tar.gz. Your submission (.tar.gz) must contain a text file with your group details (name and roll number of student). Your submission must contain files only with no folder hierarchy created.**

Physical data independence has to do with storage of data in hard disk. Now how this data is stored at disk sector, segment or in file. Database allows independence from these details. This assignment requires to assume that you have data stored in a file where files have been structured at two levels. One that explains the structure of table and the other that has the data. Say table has 3 fields - id, name & address. A program accessing the data needs to know the file structure, which is implemented in any database system.

You need to create a metadata file named as "**metadata.txt**" to store the structure of the data file along with the data file. Data file with the name of **db.data**.
Metadata information will be stored in text files. Format of the metadata file is as follows:

Field Name	Field Data Type	Field Size

Field Name = Name of the field (Generally, String)
Field DataType = The data type it should support is Character (or String), Integer, Float and Double
Field Size = Number of bytes required to store the value
For example, consider a user file of flight records with the following information:

ID	**Status**	**Price**
360	Landed	5999.99
217	On time	4786.98

239	Arrived	3682.99

Format description of the data file is as follows:

Field Name	Type
ID	Integer(5)
Status	Character(20)
Price	Float(10)

We would require the below metadata file for the above records:

ID	I	5
Status	C	20
Price	P	10

First column indicates field name, second column indicates its datatype and third column indicates its size.

TO DO:

1. Read and print the content of the data in the file **db-data.**
2. Compute maximum value in between given values in a specific field name.
   Your program must take **field name** as first argument.
   For example: program must run with following commands

   Java program_name field_name

   Suppose field name is price

   Java program_name price

   If field name is not valid than your program must be print an error massage.

   Compile and Run

   Program should have compiled with command

   javac program_name.java

   After the compilation is successful, you can run the program using:

   java program_name field_name

OUT PUT should look like:

```
java program_name ID

Field: ID, type: I, size: 4
Field: Item Name, type: C, size: 10
Field: Price, type: F, size: 8
Field: Inventory, type: I, size: 4

Finish reading data description file....

The data file contains these records:

-999 Apple 78.98 -89
-888 Orange -99.99 98
-452 Grape -89.99 -99
-872 Peach 1234.0 -567
-567 Pear 5678.0 99

Find max value in the field ID
Max = -452


java program_name  XYZ

Field: ID, type: I, size: 4
Field: Item Name, type: C, size: 10
Field: Price, type: F, size: 8
Field: Inventory, type: I, size: 4

Finish reading data description file....

The data file contains these records:

-999 Apple 78.98 -89
-888 Orange -99.99 98
-452 Grape -89.99 -99
-872 Peach 1234.0 -567
-567 Pear 5678.0 99

Find max value in the field XYZ
--- Error: field name not found.
```

Points to Demonstrate:

1. Your program will able to work with other data files also
   Suppose you have three data files like db.data1, db.data2, db.data3, your program run with all the data files.