Assignment 1

Submission instructions:

- The assignment should be submitted by pairs.
- You should submit one zip file. The archived file should contain 2 files:
  - A Txt file named **sql.txt** that contains: AutoIncrement trigger, MaximalDistance and the SimCalculation functions.
  - A Java class named **Assigment.java** that contains all the functions and comments.
- No need to submit the main function, but using it for the internal tests is recommended.
- The archive file name should be of form id1_id2.zip.
- Deadline: 21.11.2019

Assignment instructions:

1. Oracle SQL Developer
   a. Create a table MediaItems with the following columns:
      - MID (NUMBER(11,0)) –primary key
      - TITLE (VARCHAR2 (200))
      - PROD_YEAR (NUMBER(4))
      - TITLE_LENGTH (NUMBER(5))

   b. Create a table Similarity with the following columns:
      - MID1 (NUMBER(11,0)) – primary key, foreign key to MediaItems.MID
      - MID2 (NUMBER(11,0)) – primary key, foreign key to MediaItems.MID
      - SIMILARITY (FLOAT)

   c. Create a trigger AutoIncrement
      - On each insertion of the row into the table MediaItems, the trigger generates and update 2 values in the row: MID index and TITLE_LENGTH – length of the title.
      - The first MID index should be 0.
      - Do not use any sequence to generate MID

   d. Create the Oracle function MaximalDistance
      - The function does not receive any values.
      - The function returns the maximal distance between all the items – a number
      - Two items distance is the squared difference between the production years of the given items. E.g: $d(a, b)$ = (PROD_YEAR $\_a$ − PROD_YEAR $\_b$)^2
        Maximal distance is the maximal result of the distance calculation between all the item pairs. e.g. F = max($d(a, b) | \forall\ a, b \in MediaItems$)

e. Create an Oracle function SimCalculation which calculates the similarity between 2 media items.
   - The function receives 2 MIDs and the number maximal_distance
   - The function returns the similarity - a number in the range [0,1] (float)
   - The similarity is defined as: 1- (two_items_distance/maximal_distance)

2. Java
   a. Write class constructor:
      - The constructor receives three values:
        1. Connection string
        2. DB username
        3. DB password
      - The given parameters should be used for creation of the connection(s)

   b. Write a Java function fileToDataBase:
      - The function receives the path of the file(String).
      - The function reads the file content and inserts it to the MediaItems table
      - The file is in CSV(comma separated values) format, the first value is the title of the item and the second value is the production year [see attached file: films.csv].

   c. Write a Java function calculateSimilarity:
      - The function does not receive any values.
      - The function calculates the similarity between every pair of items in the MediaItems table using the SimCalculation and MaximalDistance Oracle functions and inserts or updates the row in the Similarity table. The inserted row should contain MID1,MID2,SIMILARITY

   d. Write a Java function printSimilarItems:
      - The function receives a long number mid.
      - The function retrieves in ascending order from the database all the items that the similarity between them and the given item is at least 0.3.
      - The function prints all the titles and the similarity value of the similar items (using System.out.println).

Good Luck, Yafit & Bar.