Exercise 3 (10 points) – can be done in pair or individually
- The first lines of all source files must be comments containing names & IDs of all members. Also create file readme.txt containing names & IDs of all members

- Put all files (source, input, readme.txt) in folder Ex3_xxx where xxx = ID of the group representative, i.e. your source files must be in package Ex3_xxx (assumedly in Maven's src/main/java). Input files must be read from this path

- The group representative zips Ex3_xxx & submits it to Google Classroom. The other members submit only readme.txt. Email submission is not accepted
==
1. Copy class <u>FilmBase</u> to your source file. This class must not be changed

```
class FilmBase {
   protected String name;
   protected int    age, currentYear = 2023;

   public FilmBase(String n, int a)    { name = n; age = a; }
   public void print()                 { /* override this in child */ }
}
```

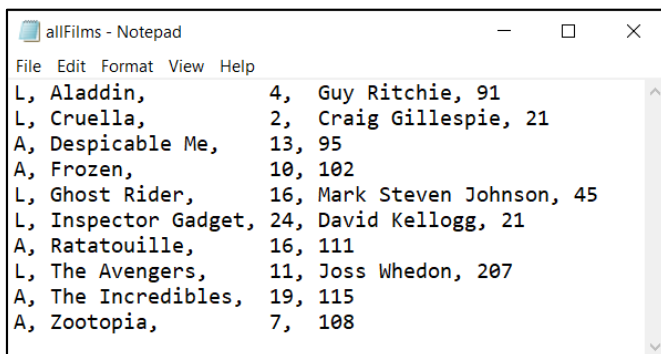2. Write classes <u>LiveAction</u>, and <u>Animation</u> that extend FileBase
   o LiveAction : add variables director and grossDollars
   o Animation : add variable lengthMinutes
   o Other variables and methods can be added to these class

3. Write another class that acts as the main class. In main method,
   3.1 Create an array of 10 FilmBase objects, e.g. FilmBase [ ] FB

   3.2 Read each line of input file into FB[i]. For each line, the type of FB[i] may be LiveAction or Animation object depending on the input
      o Column 1 = type (L = LiveAction, A = Animation)
      o Column 2 = name
      o Column 3 = age
      o Column 4 = director (for LiveAction) or length in minutes (for Animation)
      o Column 5 = opening weekend gross in million USD (for LiveAction)

```
allFilms - Notepad                          —   □   ×
File  Edit  Format  View  Help
L, Aladdin,            4,  Guy Ritchie, 91
L, Cruella,            2,  Craig Gillespie, 21
A, Despicable Me,     13, 95
A, Frozen,            10, 102
L, Ghost Rider,       16, Mark Steven Johnson, 45
L, Inspector Gadget,  24, David Kellogg, 21
A, Ratatouille,       16, 111
L, The Avengers,      11, Joss Whedon, 207
A, The Incredibles,   19, 115
A, Zootopia,           7, 108
```

Note 1 - Read the whole line into string (e.g. line) and split it at comma. Trim spaces before converting string to number; otherwise, you'll get runtime exception
```
String line    = scan.nextLine();
String [] buf = line.split(",");
int age       = Integer.parseInt(buf[2].trim());
```

Note 2 – Use <u>equals</u> or <u>equalsIgnoreCase</u> to compare strings
```
if (type.equals("A"))   // creat Animation
```

   3.3 Apply the following calculation
      o For both types of objects, calculate release year from age
      o For LiveAction, convert opening gross from USD to THB; 1 USD = 35 THB
      o For Animation, convert length from minutes to hours & minutes

   3.4 Print both LiveAction and Animation in the reverse order of the input
   3.5 Print only LiveAction in the original order
   3.6 Print only Animation in the original order

   Note 3 – Use instanceof to check type of object
```
if (FB[i] instanceof Animation)    // print Animation
```

```
--- exec-maven-plugin:3.0.0:exec (default-cli) @ solutions ---
=== Both types of films (reverse order) ===
Zootopia          (2016)    1 hrs, 48 mins
The Incredibles   (2004)    1 hrs, 55 mins
The Avengers      (2012)                        director = Joss Whedon          opening gross =  7,245 million THB
Ratatouille       (2007)    1 hrs, 51 mins
Inspector Gadget  (1999)                        director = David Kellogg        opening gross =    735 million THB
Ghost Rider       (2007)                        director = Mark Steven Johnson  opening gross =  1,575 million THB
Frozen            (2013)    1 hrs, 42 mins
Despicable Me     (2010)    1 hrs, 35 mins
Cruella           (2021)                        director = Craig Gillespie      opening gross =    735 million THB
Aladdin           (2019)                        director = Guy Ritchie          opening gross =  3,185 million THB

=== Only live action films ===
Aladdin           (2019)                        director = Guy Ritchie          opening gross =  3,185 million THB
Cruella           (2021)                        director = Craig Gillespie      opening gross =    735 million THB
Ghost Rider       (2007)                        director = Mark Steven Johnson  opening gross =  1,575 million THB
Inspector Gadget  (1999)                        director = David Kellogg        opening gross =    735 million THB
The Avengers      (2012)                        director = Joss Whedon          opening gross =  7,245 million THB

=== Only animation films ===
Despicable Me     (2010)    1 hrs, 35 mins
Frozen            (2013)    1 hrs, 42 mins
Ratatouille       (2007)    1 hrs, 51 mins
The Incredibles   (2004)    1 hrs, 55 mins
Zootopia          (2016)    1 hrs, 48 mins
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
```