

ECS705/ECS717

Lab Sheet 7: Exceptions and File I/O

Essential exercises:

Exercise 39.

Write a program that calculates the average of N integers. The program should prompt the user to enter the value for N and then afterward must enter all N numbers. If the user enters a non-positive value for N, then an exception should be thrown (and caught) with the message "N must be positive." If there is any exception as the user is entering the N numbers, an error message should be displayed and the user prompted to enter the number again.

Exercise 40.

Write a program Find that searches a file specified on the command line and prints out all lines containing the keyword.

```
java Find filename Homework.txt
```

then the program might print

```
Homework.txt:3 String filename;  
Homework.txt:22 //The string representation of the filename  
Homework.txt:27 filename = "test.txt";
```

The keyword is always the first command line argument and the name of the file to search the second.

Exercise 41.

The textfiles `boynames.txt` and `girlnames.txt`, contain a list of the 1,000 most popular boy and girl names in the United States for the year 2003 as compiled by the Social Security Administration.

These are blank-delimited files where the most popular name is listed first, the second most popular name is listed second, and so on, to the 1,000th most popular name, which is listed last. Each line consists of the first name followed by a blank space and then the number of registered births using that name in the year. For example the `girlnames.txt` file begins with:

```
Emily 25494  
Emma 22532  
Madison 19986
```

This indicates that Emily was the most popular name with 25,494 registered namings, Emma was the second most popular with 22,532, and Madison was the third most popular with 19,986.

Write a program that reads both the girl's and boy's files into memory using arrays or ArrayLists. Then, allow the user to input a name. The program should search through both arrays. If there is

a match, then it should output the popularity ranking and the number of namings. The program should also indicate if there is no match.

For example, if the user enters the name "Justice," then the program should output:

```
Justice is ranked 456 in popularity among girls with 655 namings.  
Justice is ranked 401 in popularity among boys with 653 namings.
```

If the user enters the name "Walter," then the program should output:

```
Walter is not ranked among the top 1000 girl names.  
Walter is ranked 356 in popularity among boys with 775 namings.
```

Desirable exercises:

Exercise 42.

Write a program that replaces each line of a file with its reverse. For example if you run:

```
java Reverse HelloPrinter.java
```

Then the contents of `HelloPrinter.java` are changed to

```
retnirPolleH ssalc cilbup  
{  
)sgra ][gnirtS(niam diov citats cilbup  
{  
wodniw elosnoc eht ni gniteerg a yalpsiD //  
;) "dlroW , olleH" (nltnirp.tuo.metsyS  
}  
}
```

Of course, if you run `Reverse` twice on the same file, you get the original file.

Optional exercises:

Exercise 43.

Modify your program from Exercise 45 to search multiple files and, optionally, allow the user to save the results to file. So if the user uses the tool as follows:

```
java Find ring report.txt address.txt Homework.txt
```

then the program might print

```
report.txt : has broken up an international ring of DVD bootleggers that  
address.txt: Kris Kringle, North Pole  
address.txt: Homer Simpson, Springfield  
Homework.java String filename;
```

If the user uses it:

```
java Find ring report.txt address.txt Homework.txt >> ringsearch.txt
```

then the program saves the output into a file called `ringsearch.txt`.

Please ensure that you provide meaningful error messages to your user.

