

Ariel University, School of Computer Science
Introduction to Computer Science, 2025A

Ex1 - Foundation of function programming & Testing

Abstract:

This assignment focuses on the foundation of function programming and testing, it covers Strings, arrays, and numerical computations. Make sure your solution is 100% correct (test everything) and then iterate your code so it will be as elegant as possible. Use Github for all the development.

In this assignment, we will design a number formatting converter and calculator. In general, we will use Strings as numbers over the base of binary till Hexa (2-16), 10-16 are represented by A,B,..G. The general representation of the numbers is as a String with the following format: <number><base> e.g., "135bA" (i.e., "135"), "100111b2", "12345b6", "012b5", "123bG", "EFbG". The following are NOT in the format: "b2", "0b1", "123b", "1234b11", "3b3", "-3b5", "3 b4", "GbG", "", null.

To Do:

First part (Start here):

1. Understand the assignment, in particular, go over [Ex1.java](#) templates class which you should implement.
2. Run the suggested solution ([Ex1Sol.jar](#)), `java -jar Ex1Sol.jar`
3. Create a new Java project named Ex1 (in IJ). Share the project on GitHub - as a **private repository** (Git→ Github → Share project on Github). Add the following java files: [Ex1.java](#), [Ex1Test.java](#), and [Ex1Main.java](#), and start working on the readme.
4. Implement the required static functions, making sure you use the [Ex1.java](#) template class. Use GitHub from the very beginning—commit (push) frequently.

Second part (once you complete the first part);

5. Add the following java classes: [Ex1Test.java](#), and [Ex1Main.java](#) to the repository.

6. Edit [Ex1Main.java](#) so that it will perform as in the [Ex1Sol.jar](#) file.
7. Add your detailed JUnit tests in the [Ex1Test.java](#) template class - test as much as you can.
8. Complete the assignment by reviewing the GitHub: readme + code + tests. and submit a text file named Ex1.txt with a link to your Ex1 repository (to Moodle).
9. Deadline 12/12/2024! no extensions!
10. Change your repository accessibility to "public" - after the due date.

Notes:

1. You can discuss this assignment with anyone in class, but when writing the solution, do it **yourself!** Please go over this document, which covers the School's honesty policy.
2. For any questions regarding Ex1, please email Ilan (TA):
ilans@ariel.ac.il

Example (running Ex1Sol.java):

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

1

num1= 1 is number: true , value: 1

Enter a string as number#2 (or "quit" to end the program):

0

num2= 0 is number: true , value: 0

Enter a base for output: (a number [2,16])

10

$1 + 0 = 1$

$1 * 0 = 0$

Max number over [1,0,1,0] is: 1

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

1001b2

num1= 1001b2 is number: true , value: 9

Enter a string as number#2 (or "quit" to end the program):

11b3

num2= 11b3 is number: true , value: 4

Enter a base for output: (a number [2,16])

10

$1001b_2 + 11b_3 = 13$

$1001b_2 * 11b_3 = 36$

Max number over [1001b2,11b3,13,36] is: 36

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

1DbG

num1= 1DbG is number: true , value: 29

Enter a string as number#2 (or "quit" to end the program):

AAbB

num2= AAbB is number: true , value: 120

Enter a base for output: (a number [2,16])

2

$1DbG + AAbB = 10010101b_2$

$1DbG * AAbB = 110110011000b_2$

Max number over [1DbG,AAbB,10010101b2,110110011000b2] is:

110110011000b2

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

1b

num1= 1b is number: false , value: -1

ERR: num1 is in the wrong format! (1b)

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

1

num1= 1 is number: true , value: 1

Enter a string as number#2 (or "quit" to end the program):

0b2

num2= 0b2 is number: true , value: 0

Enter a base for output: (a number [2,16]

2

1 + 0b2 = 1b2

1 * 0b2 = 0b2

Max number over [1,0b2,1b2,0b2] is: 1

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

12

num1= 12 is number: true , value: 12

Enter a string as number#2 (or "quit" to end the program):

10011b2

num2= 10011b2 is number: true , value: 19

Enter a base for output: (a number [2,16]

16

12 + 10011b2 = 1FbG

12 * 10011b2 = E4bG

Max number over [12,10011b2,1FbG,E4bG] is: E4bG

Ex1 class solution:

Enter a string as number#1 (or "quit" to end the program):

quit

quitting now...