

1. Modify the **GDP** Program you have completed in Assignment 1 so that an **ArrayList** is used to store data.
2. Modify the **ArrayListProcessing** program we have completed in the lab.
 - Use the **ArrayList** to store **100** random integers.
 - In the **printArrayList** method, print all the elements in the **ArrayList**, but only 10 elements per line.
 - Write a method to return the index of the largest element.
 - Write a method to return the mean as a double.
 - Write a method to return the standard deviation as a double.

$$\text{Standard Deviation} = \sqrt{\frac{(x_1 - \text{mean})^2 + (x_2 - \text{mean})^2 + \dots + (x_i - \text{mean})^2 + \dots + (x_n - \text{mean})^2}{n}}$$

In the **main** method:

- Call these methods and output the results.
- Replace the smallest element with the actual value of -99.
- Remove the largest element.
- Output the **ArrayList** again.

Sample run:

```
100 Elements in the ArrayList, organized by 10:
348 241 462 460 77 397 137 308 370 43
4 289 447 116 467 385 147 262 317 209
462 285 37 68 216 37 160 275 8 425
44 180 113 490 375 119 453 390 134 402
315 31 301 236 419 268 198 232 126 278
150 120 114 145 16 182 69 429 328 280
254 157 374 224 226 54 481 171 398 389
255 186 393 81 329 35 264 135 393 170
53 104 179 108 254 176 424 293 468 453
424 222 244 240 395 110 133 480 17 430

Mean: 245.72
Standard Deviation: 140.84
The largest element in the ArrayList is 490 at index 33.
The smallest element in the ArrayList is 4 at index 10.

After replacing the smallest value with -99 and removing the largest element:
348 241 462 460 77 397 137 308 370 43
-99 289 447 116 467 385 147 262 317 209
462 285 37 68 216 37 160 275 8 425
44 180 113 375 119 453 390 134 402 315
31 301 236 419 268 198 232 126 278 150
120 114 145 16 182 69 429 328 280 254
157 374 224 226 54 481 171 398 389 255
186 393 81 329 35 264 135 393 170 53
104 179 108 254 176 424 293 468 453 424
222 244 240 395 110 133 480 17 430
```

Due date: Wednesday, 9/7/22

- To receive full credit, the assignment must be submitted by the due date. Late submissions will incur a penalty of 5% per day.
- Upload the programs to D2L.

Each program should have a file header section. /* * Author: Your name * Date: Date of completion * Assignment: Assignment # NameOfSourceCode.java * Description: The program description */	Up to 5% deduction
Each program should be written with the appropriate form and style. Use indentation, blank line, and comments to make the source code easy to read.	Up to 5% deduction
Use Java naming convention and meaningful names to name the classes, methods, variables, constants, and other identifiers in the programs.	Up to 5% deduction
Format the output appropriately	Up to 5% deduction