Lab 1
Methods and Arrays

Object-oriented Programming

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Price Management Program

- Write a Java program which
  - Makes discount on product prices based on a discount rate, e.g., %20
  - Finds cheap products: Cheap products are products where the price is lower than a specified limit.

- Prices of products are stored in a double array
  - `double[] prices = {30.4, 100.6, 80.6, 40.4, 70.8, 66.8, 10.2, 2.6, 102.2, 90.0, 50.3, 21.6};`
- Discount operation is done by a method:
  - `double[] discountedPrices = makeDiscount(prices, discountRate);`
- Finding cheap products is done by a method:
  - `double[] cheapProducts = getCheapProducts(discountedPrices, cheapLimit);`

- Your methods **should not change** their input arguments
- The size of the `cheapProducts` array varies according to the `cheapLimit` input value. It can even be **null**.

Main Source Code and Sample Output

```java
import java.util.Arrays; // required for Arrays.toString method

public class Lab01 {
  public static void main(String[] args) {
    double[] prices = {30.4, 100.6, 80.6, 40.4, 70.8, 66.8, 10.2, 2.6, 102.2, 90.0, 50.3, 21.6};

    double discountRate = 0.2; // make 20 percent discount
    double[] discountedPrices = makeDiscount(prices, discountRate);

    double cheapLimit = 50.0; // find cheap products ( cheaper than 50.0 )
    double[] cheapProducts = getCheapProducts(discountedPrices, cheapLimit);

    System.out.println("Prices : " + Arrays.toString(prices));
    System.out.println("Discounted Prices : " + Arrays.toString(discountedPrices));
    System.out.println("Cheap Products : " + Arrays.toString(cheapProducts));
  }
  private static double[] makeDiscount(double[] inputPrices, double discountRate) {. . .}
  private static double[] getCheapProducts(double[] inputPrices, double cheapLimit) {. . .}
}
```

Output

```
Prices           : [30.4, 100.6, 80.6, 40.4, 70.8, 66.8, 10.2, 2.6, 102.2, 90.0, 50.3, 21.6]
Discounted Prices : [24.32, 80.48, 64.48, 32.32, 56.64, 53.44, 8.16, 2.08, 81.76, 72.0, 40.24, 17.28]
Cheap Products    : [24.32, 32.32, 8.16, 2.08, 40.24, 17.28]
```

Notes

- Algorithm of getCheapProducts is a little bit difficult
  - We do not know the size of the output array?