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Java Optional Assignment - 3

Q1. Code an interactive, two-player game of Tic-Tac-Toe. You'll use a two-dimensional array of chars.

Q2. A group of MIT friends decide to run the Boston Marathon. Their names and times (in minutes) are below:

Name	Time (minutes)
Elena	341
Thomas	273
Hamilton	278
Suzie	329
Phil	445
Matt	402
Alex	388
Emma	275
John	243
James	334
Jane	412
Emily	393
Daniel	299
Neda	343
Aaron	317
Kate	265

Find the fastest runner. Print the name and his/her time (in minutes).

Optional: Find the second fastest runner. Print the name and his/her time (in minutes).

Write a method that takes as input an array of integers and returns the index corresponding to the person with the lowest time.

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Run this method on the array of times. Print out the name and time corresponding to the returned index.

Optional :Write a second method to find the second-best runner. The second method should use the first method to determine the best runner, and then loop through all values to find the second-best (second lowest) time.

Here is a program skeleton to get started:

class Marathon {

public static void main (String[] arguments) {

String[] names = { "Elena", "Thomas", "Hamilton", "Suzie", "Phil", "Matt", "Alex", "Emma", "John", "James", "Jane", "Emily", "Daniel", "Neda", "Aaron", "Kate" };

int[] times = { 341, 273, 278, 329, 445, 402, 388, 275, 243, 334, 412, 393, 299, 343, 317, 265 };

for (int i = 0; i < names.length; i++) {

System.out.println(names[i] + ": " + times[i]); } } }

Q3. Create an array of ElectronicsStock of size 3 to keep 3 products

Store Mobile Instance on 0th index of array

Store TV Instance on 1st index of array

Store Washing Machine Instance on 2nd index of array

* Write a menu driven code to

1.add these products into array along with qty

2.display all products along with qty

3.purchase product(If qty is 0 then raise exception of above execption class)

* purchase should happen only if qty is greater than 0 and after purchase the qty should decrement

Use the below given Skleton.

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```
abstract class Electronics {
    String model;
    String description;
    double price;
    // to accept electronnics field data
    void accept() {
    }
    abstract void acceptData();

    // to print electronnics field data
    void print() {
    }
    abstract void printData();
}

class Mobile extends Electronics {
    int ram;
    int storage;
    // override acceptdata and printdata
    // call super class accept and print method in it.
}

class Tv extends Electronics {
    int screen_inches;
    int pixel_density;
    // override acceptdata and printdata
    // call super class accept and print method in it.
}
```

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```
class WashingMachine extends Electronics {
    int capacity;
    String type; // semi/full automatic
    // override acceptdata and printdata
    // call super class accept and print method in it.
}

class MobileException {
    // write logic inside this as per your requirement
    // If user enters ram,storage as 0 or negative this exception should class
    // should be raised.
    // This class should come under checked exception
}

class ElectronicsException {
    // write logic inside this as per your requirement
    // If user enters screen_inches, pixel_density, capacity as 0 or negative this
    // exception should class should be raised.
    // This class should come under unchecked exception
}

interface StockManager {
    void addStock();
    void purchaseProduct();
    void displayStock();
}

class ElectronicsStock implements StockManager {
    Electronics item;
```

```
    int quantity;
}
```