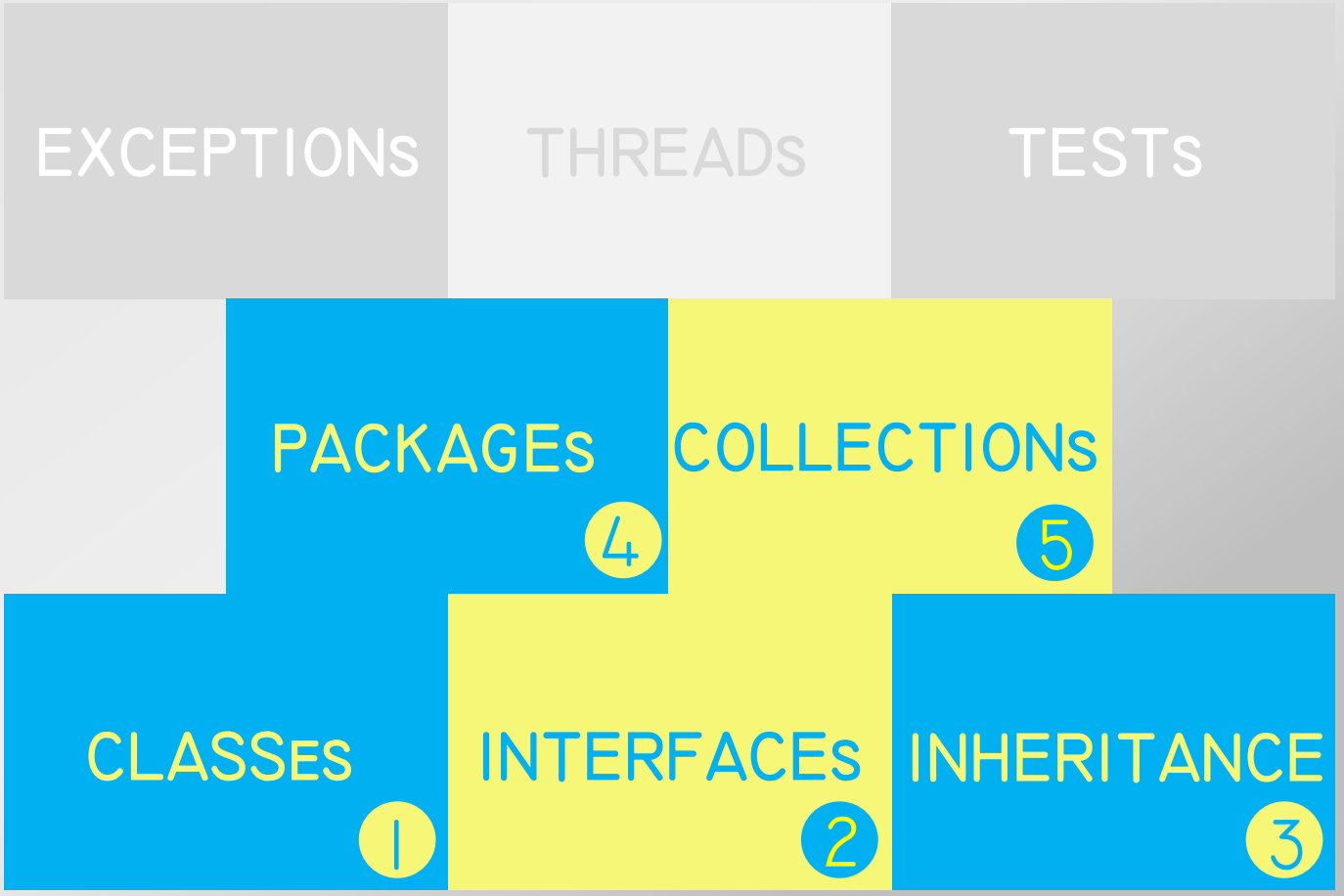
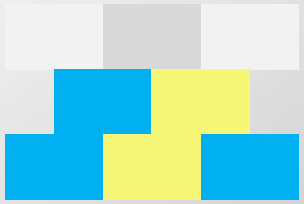
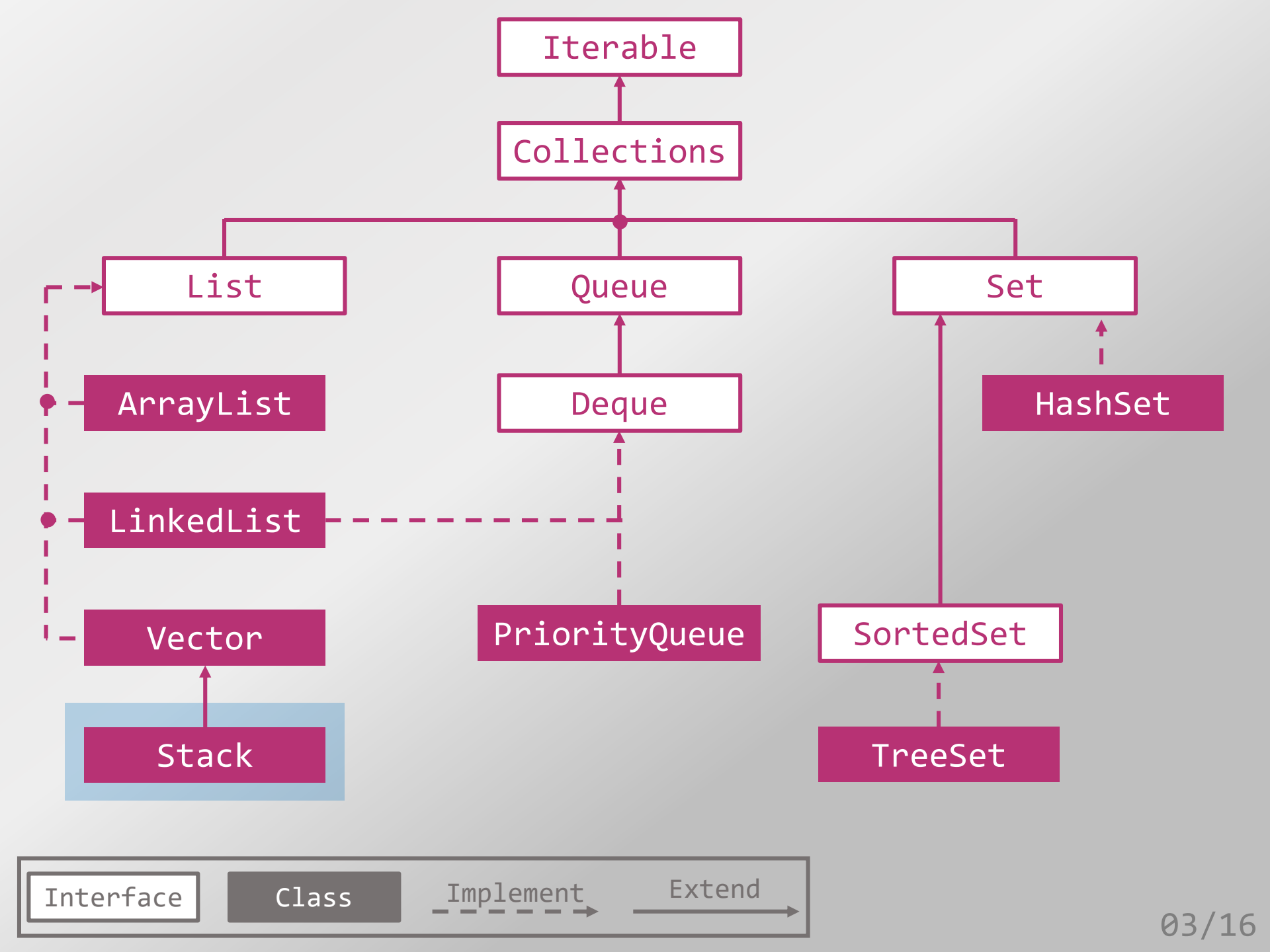
BASICS of Java



# COLLECTIONS

- THE Stack CLASS, THE Iterator INTERFACE
- THE PriorityQueue CLASS
- THE LinkedList CLASS
- THE HashSet CLASS
- THE HashMap CLASS



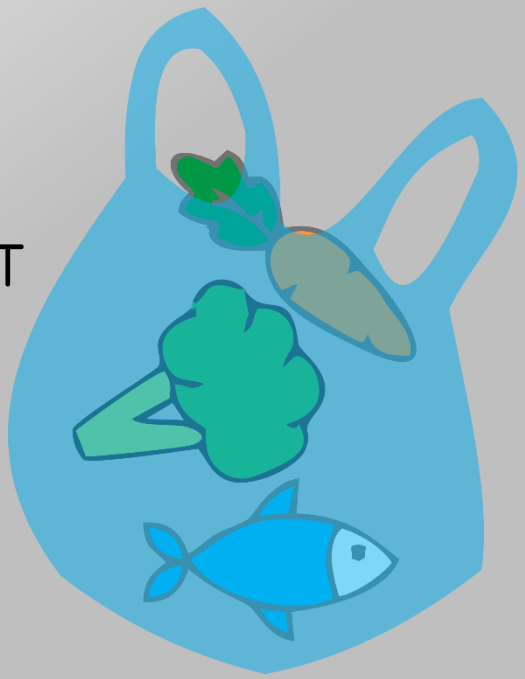

Iterable
Collections
List
Queue
Set
ArrayList
Deque
HashSet
LinkedList
Vector
PriorityQueue
SortedSet
Stack
TreeSet
Interface
Class
Implement
Extend

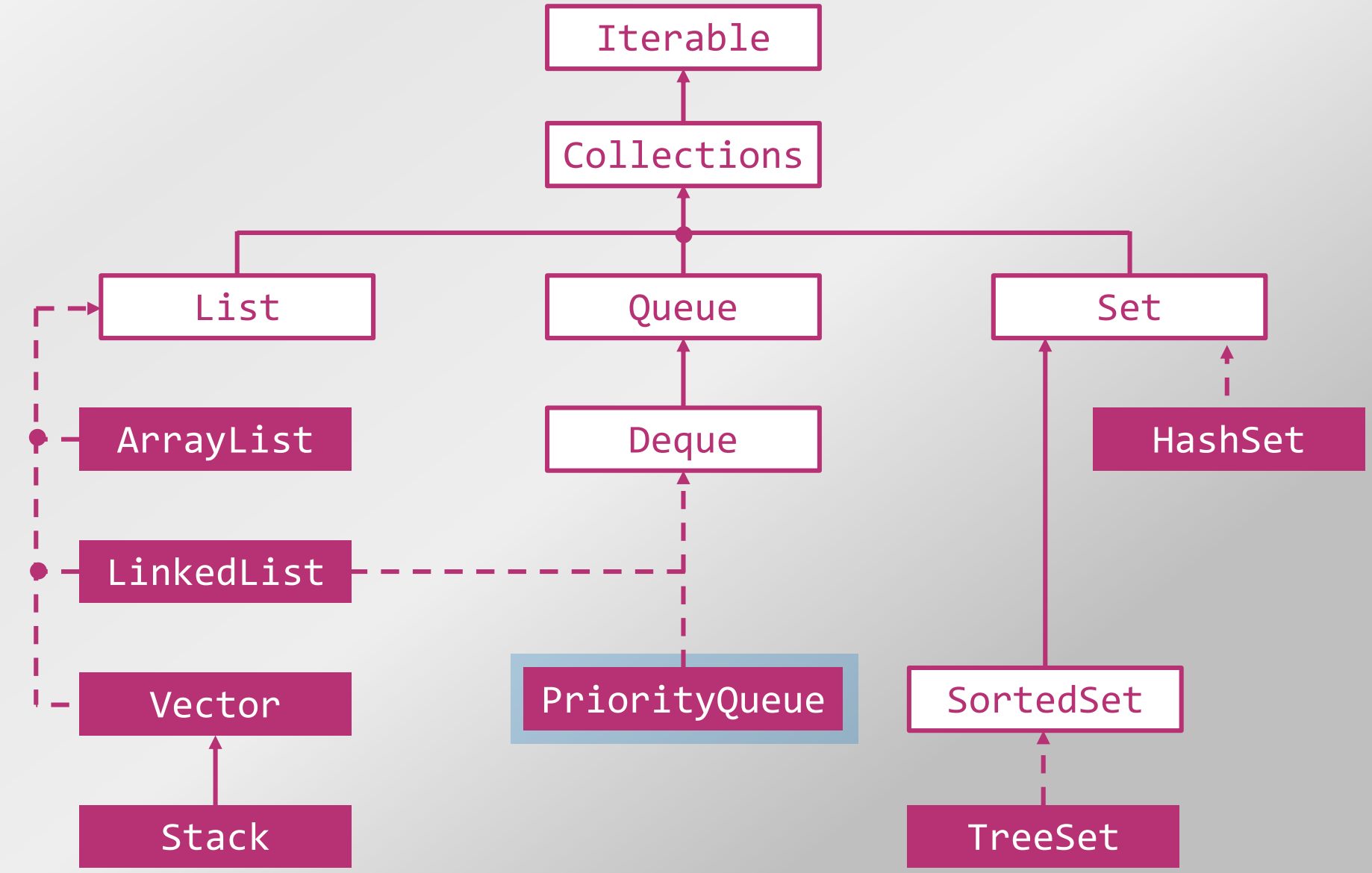
☐ IN THE MAIN PROGRAM CREATE AN OBJECT OF THE Stack<String> CLASS CALLED <bag>.

1-3

☐ ASK A USER IF S/HE WANTS TO "put" A PRODUCT TO <bag>, "take" THE LAST ADDED PRODUCT FROM <bag>, "print" THE CONTENT OF <bag> OR "exit". THE PROGRAM SHOULD KEEP ASKING UNTIL THE USER ENTERS "exit" (USE THE **while** LOOP).

☐ DEPENDING ON THE USER INPUT: PUT A PRODUCT OR TAKE THE LAST ADDED PRODUCT OR DISPLAY THE CONTENT IN THE CONSOLE OR CLOSE THE PROGRAM (USE THE **switch** STATEMENT).

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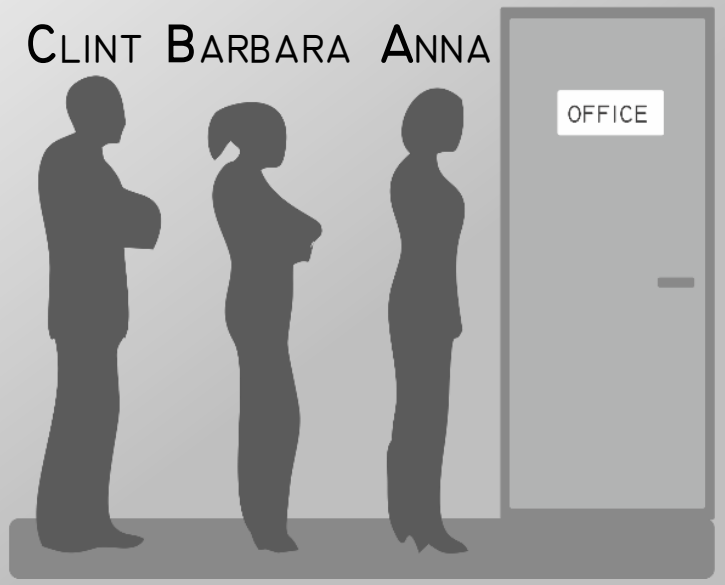
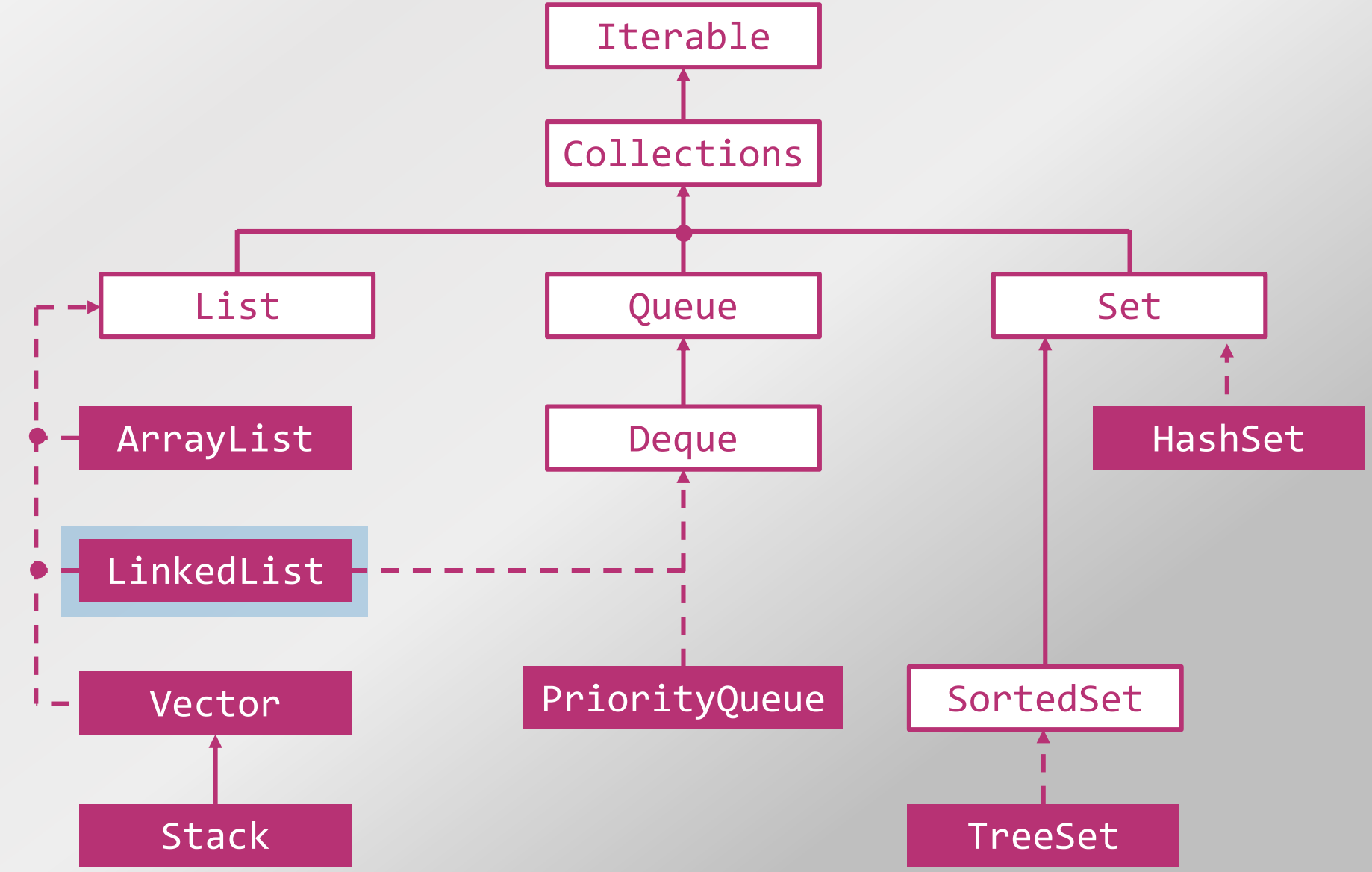
4

☐ INSTEAD OF THE Stack<String> CLASS USE THE PriorityQueue<String> CLASS TO KEEP PRODUCTS. THIS TIME A USER CAN "take" THE FIRST ITEM ACCORDING TO THE NATURAL ORDERING. UPDATE THE MAIN PROGRAM USING THE METHODS OF THE PriorityQueue CLASS.

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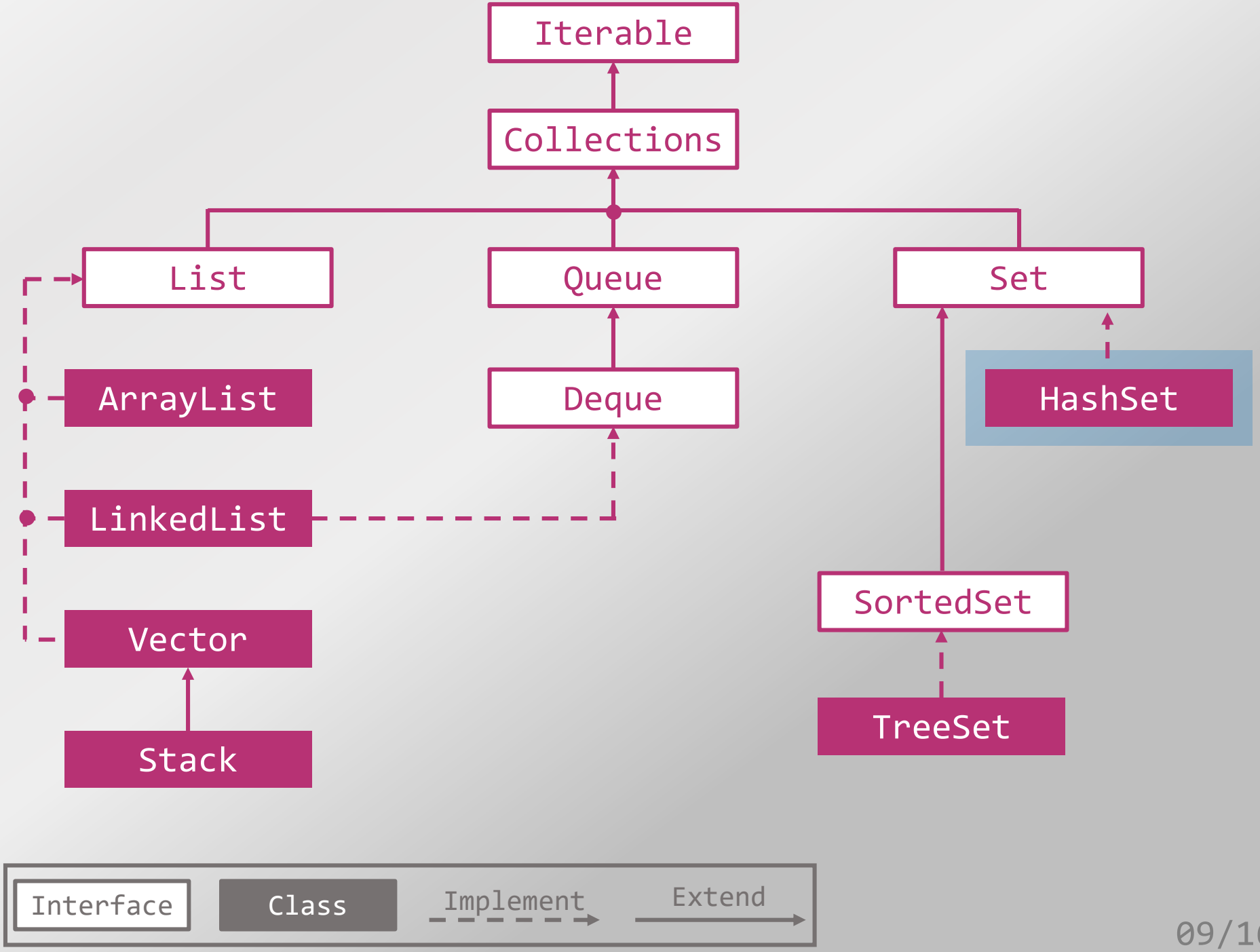
5

☐ NOW USE THE LinkedList<String> CLASS TO KEEP PRODUCTS. A USER SHOULD BE ABLE TO "take" THE FIRST ITEM ACCORDING TO FIFO. UPDATE THE MAIN PROGRAM ACCORDINGLY.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6

☐ NOW USE THE HashSet<String> CLASS TO KEEP PRODUCTS. BEFORE "take"+ing A PRODUCT A USER SHOULD SPECIFY ITS NAME. UPDATE THE MAIN PROGRAM ACCORDINGLY.

☐ TRY TO "put" THE SAME PRODUCT TO <bag> TWICE. THEN, "print" THE CONTENT OF THE <bag>. WHAT DO YOU SEE? WHY?

☐ What would we see in the console if we run the code below? Why? Correct the code (use the Iterator interface).

7

```
import java.util.ArrayList;

public class Main {
    public static void main(String[] args) {

        ArrayList<String> arrL = new ArrayList<String>();
        arrL.add("Sweden");
        arrL.add("Japan");
        arrL.add("Kuba");
        arrL.add("Spain");

        for (int i = 0; i < arrL.size(); i++) {
            arrL.remove(i);
        }

        System.out.println("ArrayList size: "+ arrL.size());
        for (int i = 0; i < arrL.size(); i++) {
            System.out.println(arrL.get(i));
        }
    }
}
```

# REVERSE POLISH NOTATION

| | | |
|---|---|---|
| 1 + 2 | = | 1 2 + |
| 1 - 2 | = | 1 2 - |
| 1 * 2 | = | 1 2 * |
| 1 / 2 | = | 1 2 / |

☐ COMPLETE THE CODE BELOW THAT USES AN OBJECT OF THE Stack CLASS TO CALCULATE THE EXPRESSION IN s:

8*

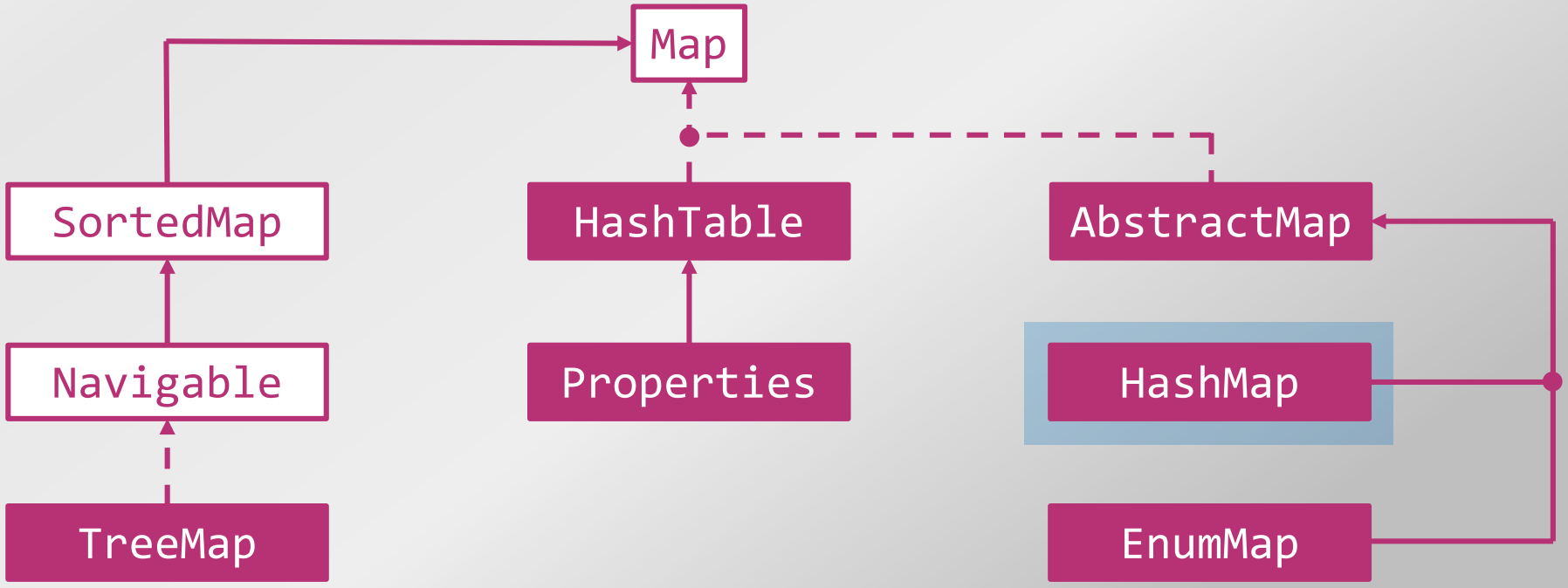
```
public class Main {
    public static void main(String[] args) {
        // reverse Polish notation for "1 + 2":
        String s = "1 2 +";
        String[] sArr = s.split(" ");     // sArr = ["1", "2", "+"]

        // TODO: create an object of the Stack class called <stack>

        for (int i = 0; i < sArr.length; i++) {
            // TODO: add the elements of <sArr> to <stack>
        }

        // TODO: declare and initialize a string that contains the last
           element of <stack>
        // TODO: declare and initialize an integer that contains the 2nd
           element of <stack>
        // (parse String to int)
        // TODO: declare and initialize an integer that contains the 1st
           element of <stack>

        // TODO: using the switch statement display in the console the
           result of expression in <s> depending on the operator that
           is used ("-","+","*", or"/"):
    }
}
```


Map
SortedMap
HashTable
AbstractMap
Navigable
Properties
HashMap
TreeMap
EnumMap


Interface
Class
Implement
Extend

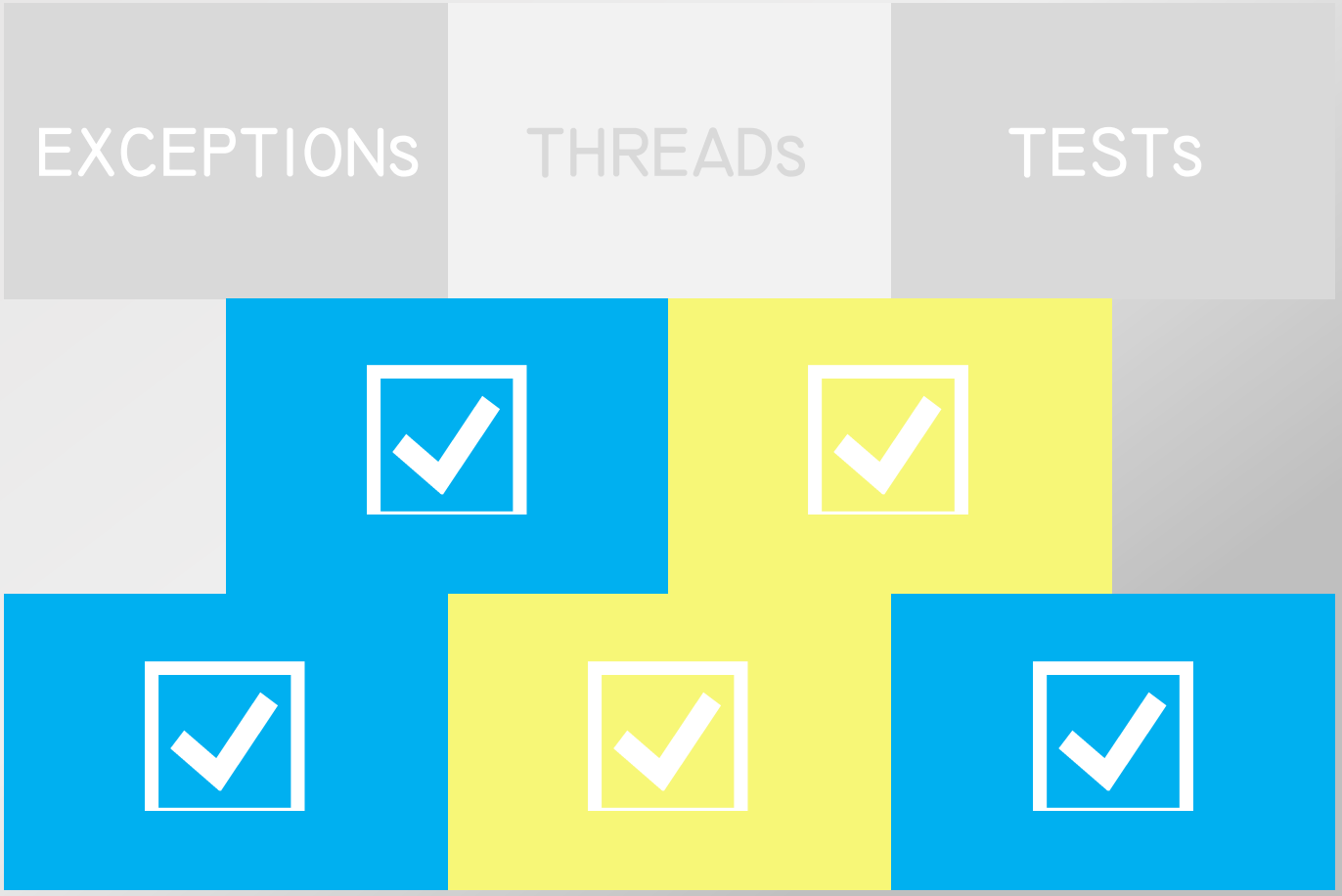
9-10

☐ IN THE MAIN PROGRAM CREATE AN OBJECT OF THE HashMap<String,String> CLASS. ADD NAMES OF FIVE COUNTRIES (keys) WITH THEIR CORRESPONDING CAPITALS (values).

☐ ASK A USER TO TYPE THE CAPITALS OF EACH COUTRIE ONE BY ONE. IF THE ANSWER IS CORRECT, DISPLAY IN THE CONSOLE "correct", OTHERWISE DISPLAY THE CORRECT ANSWER.

EXPECTED OUTPUT:

```
The capital of Italy: Warsaw
the correct answer: Rome
The capital of France: Paris
correct
The capital of Portugal: Madrid
the correct answer: Lisbon
The capital of Spain: Lisbon
the correct answer: Madrid
```


EXCEPTIONs
THREADs
TESTs