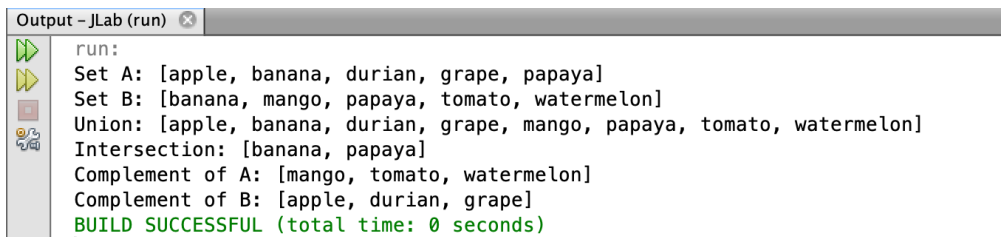


Lab 05 – Generics and Collections

Objectives:

- Learn to define generics classes with parametric type
 - Learn to apply Java Collections Framework to solve practical problems
1. Given a generic interface `Stack<E>` which defines a linear LIFO data structure, you are asked to create an implementation of this interface and name it `MyStack<E>`. The driver program `TestMyStack` can be run to test against your implementation.
 2. Given two sets of fruits, **A** and **B**, write a program to find out their union, intersection and complements of each set.

```
Set A: [apple, banana, durian, grape, papaya]
Set B: [banana, mango, papaya, tomato, watermelon]
```



```
run:
Set A: [apple, banana, durian, grape, papaya]
Set B: [banana, mango, papaya, tomato, watermelon]
Union: [apple, banana, durian, grape, mango, papaya, tomato, watermelon]
Intersection: [banana, papaya]
Complement of A: [mango, tomato, watermelon]
Complement of B: [apple, durian, grape]
BUILD SUCCESSFUL (total time: 0 seconds)
```

Discuss the following items with your classmates:

- a. Compare the difference between using `HashSet` and `TreeSet` in the program above.
 - b. Why is it a good practice to immediately assign a newly created collection (e.g. `HashSet`) to its correspondingly interface type (e.g. `Set`)?
3. Given the class `Card.java`, write a program to do the following tasks using JCF and print out the result of each task.
 - a. Initialize a normal 52-card deck in its **natural order** as shown below.
 - b. Shuffle the deck
 - c. Deal four hands of cards and sort each hand in its natural order

The **natural order** (first line) and a sample output is shown as below.

```
Initial:      [♠2, ♠3, ♠4, ♠5, ♠6, ♠7, ♠8, ♠9, ♠10, ♠J, ♠Q, ♠K, ♠A, ♥2, ♥3, ♥4, ♥5, ♥6, ♥7, ♥8,
♥9, ♥10, ♥J, ♥Q, ♥K, ♥A, ♦2, ♦3, ♦4, ♦5, ♦6, ♦7, ♦8, ♦9, ♦10, ♦J, ♦Q, ♦K, ♦A]

After shuffle: [♥3, ♦4, ♠Q, ♥7, ♠2, ♥10, ♠9, ♦3, ♠8, ♠3, ♦6, ♦7, ♦Q, ♦8, ♠J, ♥6, ♠3, ♦2, ♠7, ♠8,
♥4, ♥2, ♠10, ♦10, ♥K, ♠A, ♦9, ♦5, ♥J, ♠Q, ♠10, ♠5, ♠K, ♠J, ♠K, ♥9, ♥5, ♥8, ♠2, ♠6, ♠6, ♥A, ♠A, ♠5,
♠4, ♦K, ♠7, ♥Q, ♦J, ♠9, ♦A, ♠4]

Hand 1: [♠9, ♠Q, ♥3, ♥7, ♥10, ♠2, ♠3, ♠8, ♦3, ♦4, ♦6, ♦7, ♦Q]
Hand 2: [♠3, ♠7, ♠8, ♠10, ♠A, ♥2, ♥4, ♥6, ♥K, ♠J, ♦2, ♦8, ♦10]
Hand 3: [♠2, ♠J, ♠K, ♥5, ♥8, ♥9, ♥J, ♠5, ♠10, ♠Q, ♠K, ♦5, ♦9]
Hand 4: [♠4, ♠5, ♠6, ♥Q, ♥A, ♠4, ♠6, ♠7, ♠9, ♠A, ♦J, ♦K, ♦A]
```

- END -