Day 16

LinkedList

- LinkedList is collection of elements where each element is called as node. In short LinkedList is collection of nodes.
- Node is object/instance which may contain either 2 parts / 3 parts depending on type of LinkedList.
- Types of LinkedList:
    1. Singly LinkedList
        - In a LinkedList, if node contains 2 parts:
            1. data
            2. a reference variable which contains reference of next node instance is called Singly LinkedList.
    2. Doubly LinkedList
        - In a LinkedList, if node contains 3 parts:
            1. a reference variable which contains reference of prev node instance
            2. data
            3. a reference variable which contains reference of next node instance is called Doubly LinkedList.

Iterable

- In foreach loop source can be:
    1. Array
    2. Instance of a class which implements Iterable interface.
- Iterable is an interface declared in java.lang package.
- Implementing this interface allows an object to be the target of the "for-each loop" statement.
- It is introduced in JDK 1.5
- Methods of java.lang.Iterable
    1. Iterator iterator()
    2. default Spliterator spliterator()
    3. default void forEach(Consumer<? super T> action)
- Consumer is a function interface declared in java.util.function package.
- "void accept(T t)" is a functional method of Consumer.

Iterator

- It is interface declared in java.util package.
- It is introduced JDK 1.2
- Methods of Iterator interface:
    1. boolean hasNext()
    2. E next()
    3. default void remove()
    4. default void forEachRemaining(Consumer<? super E> action)
- Conclusion : If class implements Iterator interface means it is allowed to traverse in foreach loop.

Shallow Copy

- Process of copying state of variable into another variable as it is, is called shallow copy.
- Shallow copy is also called as bitwise/bit-by-bit copy.

```
int num1 = 10;
int num2 = num1;    //Shallow Copy
System.out.println(num1);   //10
System.out.println(num2);   //10
```

```
Date dt1 = new Date( 23, 7, 1983 );
Date dt2 = dt1; //Shallow Copy of references
```

Collection Framework

- If we want to manage data efficiently in RAM then we should data structure.
- In Java, data structure classes are called collection collection classes.
- Example: Stack, Queue, LinkedList etc. are collections.
- Framework is a library of reusable classes that we can use to develop application.
- Collection Framework is a library of reusable data structure classes that we can use to develop core java application.
- In Java collection is not a collection of instances rather it is collection of references.
- To use collection framework, we should import java.util package.
- Link : https://docs.oracle.com/javase/8/docs/technotes/guides/collections/overview.html
- Collection Framework Interface Hierarchy
    - java.lang.Iterable
        - java.util.Collection
            - java.util.List
            - java.util.Queue
                - java.util.Deque
            - java.util.Set
                - java.util.SortedSet
                    - java.util.NavigableSet
    - java.util.Map<K,V>
        - java.util.SortedMap<K,V>
            - java.util.NavigableMap<K,V>