Lesson 9: Java Structure

1. Data Structure is a building block of programs. It's even said that “Data Structure + Algorithms= Program".

2. Java API provides built-in support for common data structures, essential for writing programs like an array, linked list, map, set, stack, and queue.

Essential Java Data Structures

3. A linked list is another basic data structure in programming. Java provides a doubly-linked list implementation as java.util. LinkedList, this class can be used whenever a linked list data structure is needed.

Example Program:

```
import java.util.LinkedList;
class Main {
  public static void main(String[] args){

    // create linkedlist
    LinkedList<String> animals = new LinkedList<>();

    // Add elements to LinkedList
    animals.add("Dog");
    animals.add("Cat");
    animals.add("Cow");
    System.out.println("LinkedList: " + animals);
  }
}
```

Output:

```
LinkedList: [Dog, Cat, Cow]
```

4. The hash table is also known as map or dictionary data structure, you might have heard about Dictionary in Python, which is the same as Map in Java. A map provides you with O(1) functionality for getting a value back if you know the key, which is a very natural use case in most Java applications.

5. Java API also provides a Stack data structure implemented as java.util.Stack. This class extends the legacy Vector class for storing elements. Since the stack is a LIFO (Last In, First Out) data structure, it provides a push() method to insert objects and a pop() method to consume elements from the top.

6. Though you can also implement Queue by using LinkedList or array, it's much better to use existing classes, which are tried and tested. BlockingQueue is a thread-safe extension of the Queue interface and can be used to implement producer-consumer patterns in Java.

7. Set is a special data structure, which doesn't allow duplicates. It's a good data structure to store unique elements. Whenever you are storing data that needs to be unique then you can use Set data structure. If you try to insert duplicates Set will not accept it and its method will return false to indicate that insertion has failed.