

# Lists

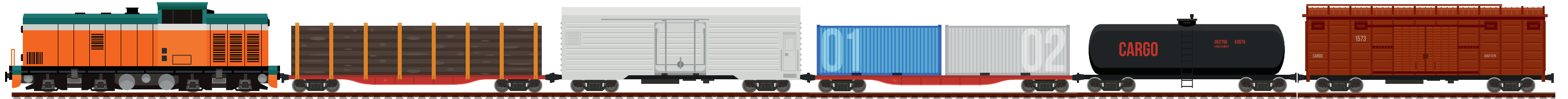
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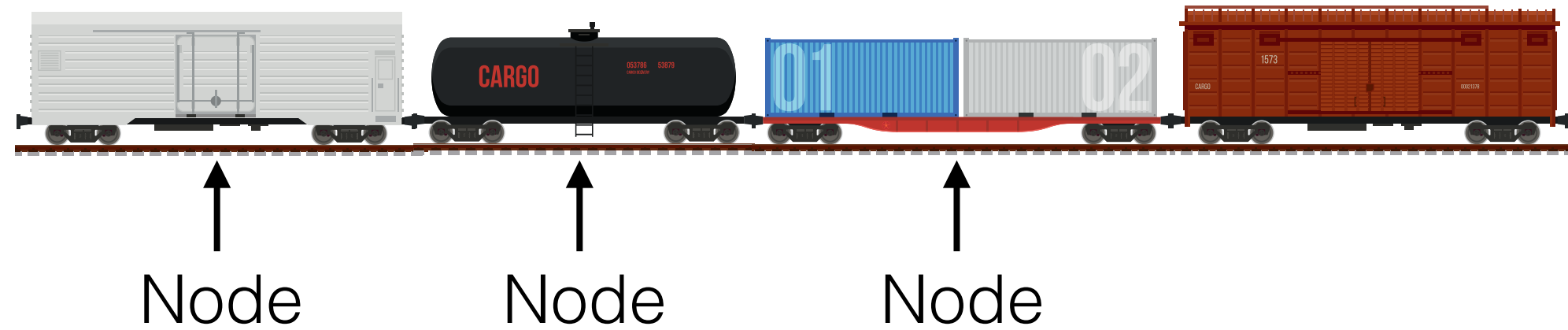
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# What Is a List?



## Linked List



# List Characteristics

FIFO, LIFO, ?      I/O - anything goes

Big O ?

add

$O(1)$



remove

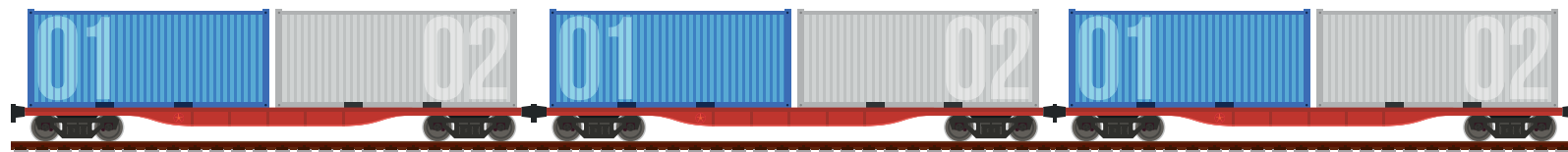
$O(1)$

insert

$O(n)$

removeAt

$O(n)$



find

$O(n)$

get

$O(n)$

# Demo

**Create linked list class**

**Underlying node structure**

# Demo

**Create size method**

**Create add/remove methods**

# Demo

**Create insert/removeAt methods**

# Demo

**Create find/get method**

**Create toString method**

# Train List Test





# Core Java Lists

**List<E>**

- <https://docs.oracle.com/javase/8/docs/api/java/util/List.html>

**Vector<E>**

**ArrayList<E>**

# List Extra Credit

## Homework

```
public static void main(String[] args) {  
    long start = System.currentTimeMillis();  
  
    //existing code here  
  
    long end = System.currentTimeMillis();  
    System.out.println("Time: " + (end - start));  
}
```

```
List<TrainCar> train = new ArrayList<TrainCar>();
```

```
int position = train.find(car3); -> int position = train.indexOf(car3);
```



# Summary

**What is a list?**

**Built basic linked list class and  
underlying node structure**

**Six list accessor operations**

**Java Lists**