# Maps

# Java Collections Framework

Collection of pairs
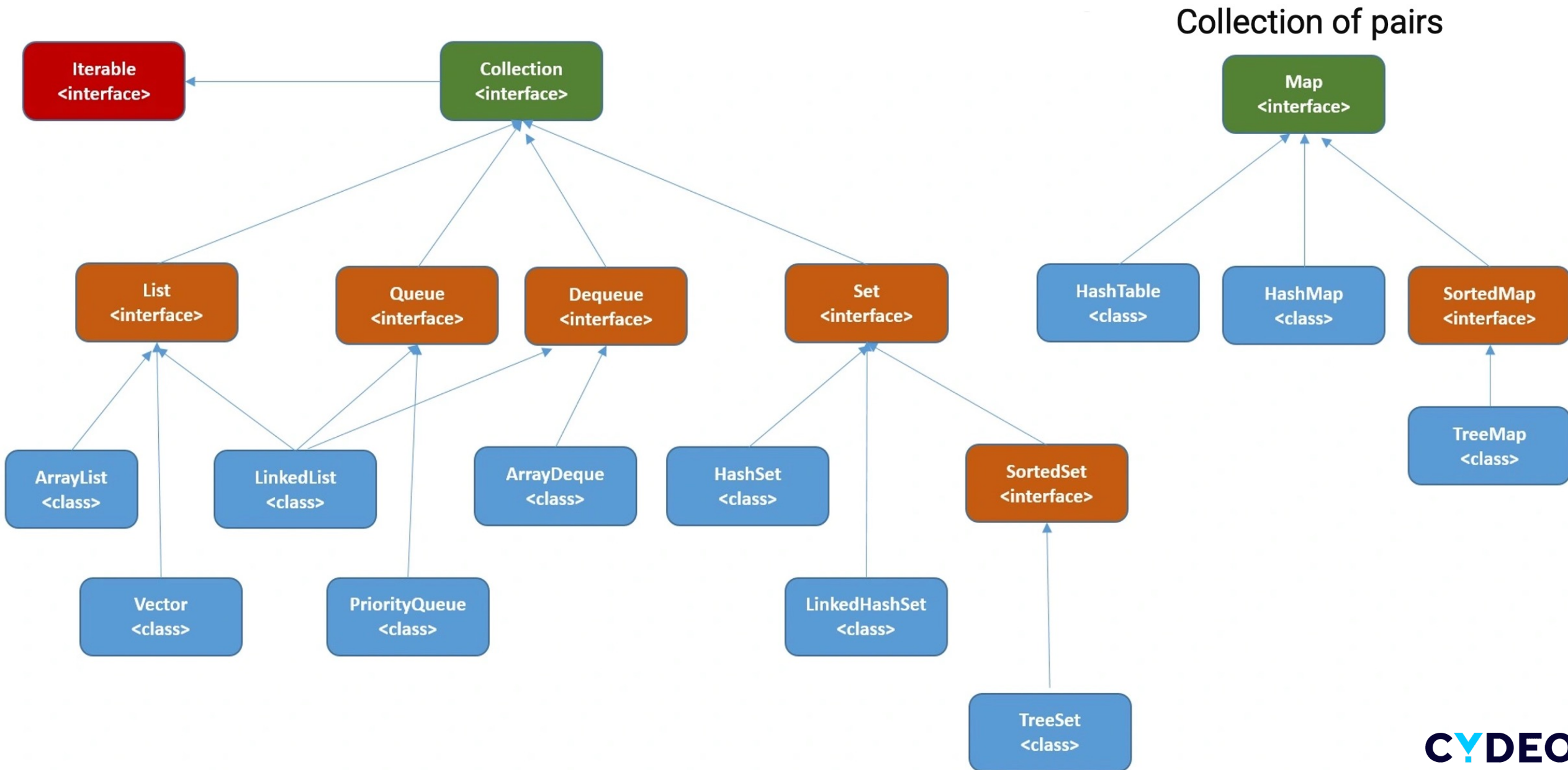
# Collection Of Pairs

| Key | Value |
|-----|-------|
| name | Arthur |
| gender | Male |
| age | 32 |
| id | A01 |
| job title | Developer |
| salary | 110000 |
| married | Yes |

Key of Map     Value of Map

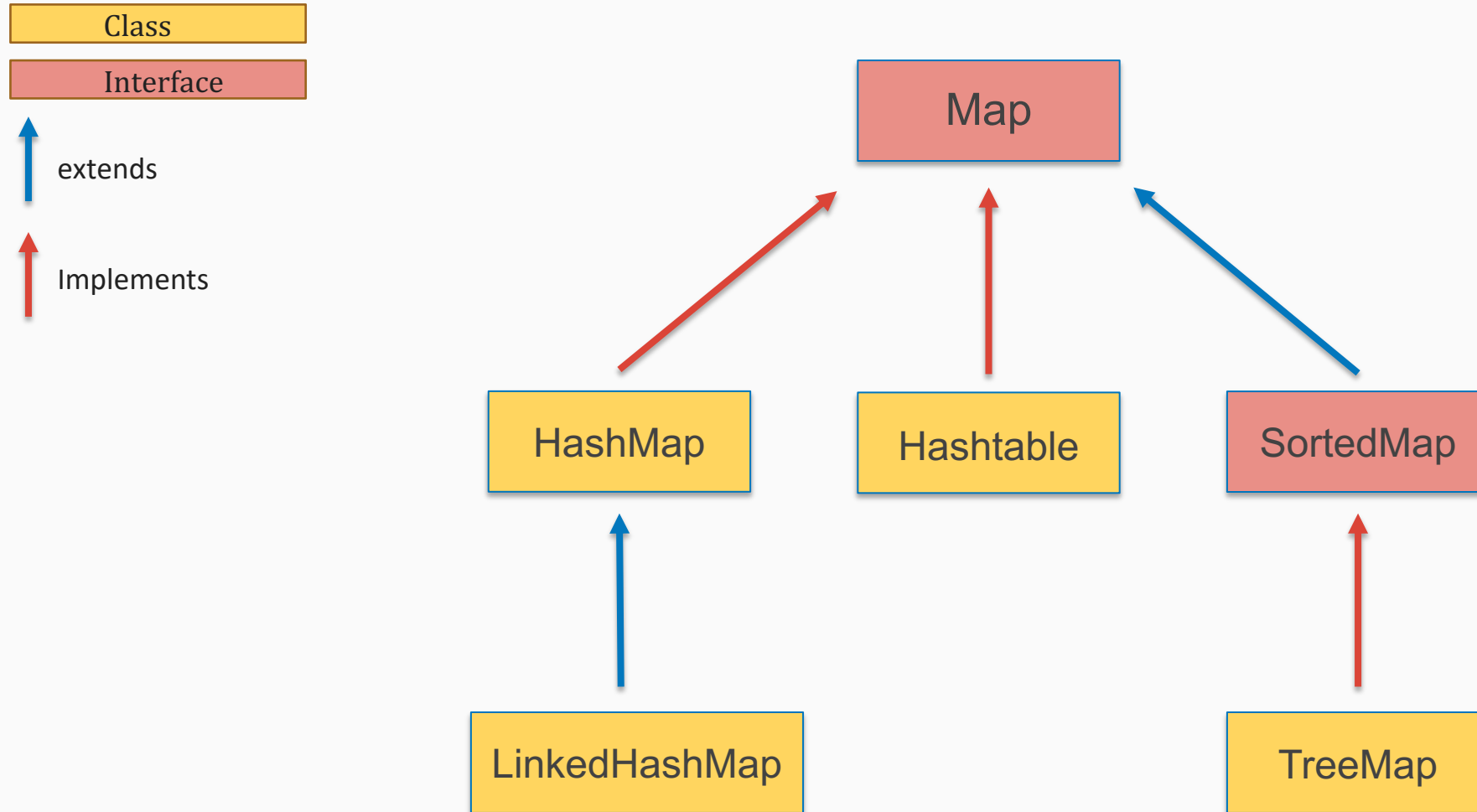| | |
|---|---|
| name | Arthur |
| gender | Male |
| age | 32 |
| id | A01 |
| job_title | Arthur |
| salary | 90000 |
| married | Yes |
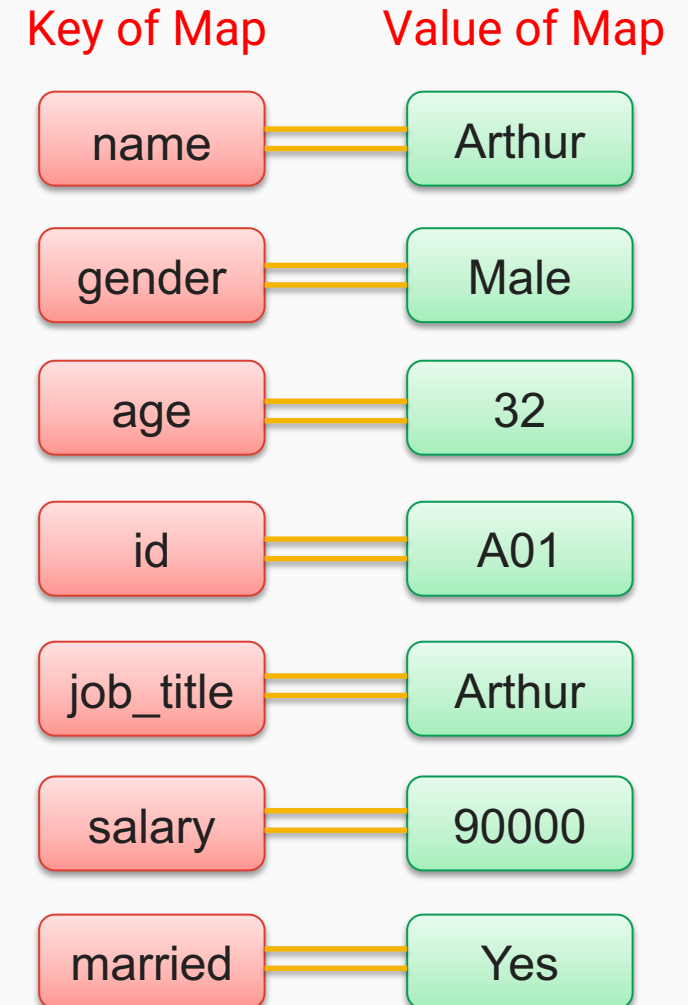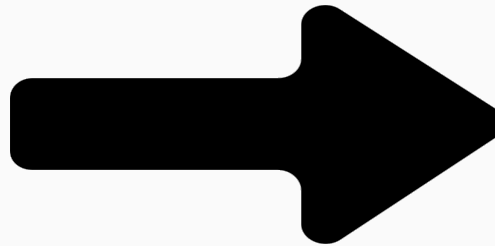
# Map

- Data structure based on the key + value pairs

- Does not have IS A relation with Collection

- Size can be increased or decreased

- Key can not be duplicated

```
import java.util.Map;
```

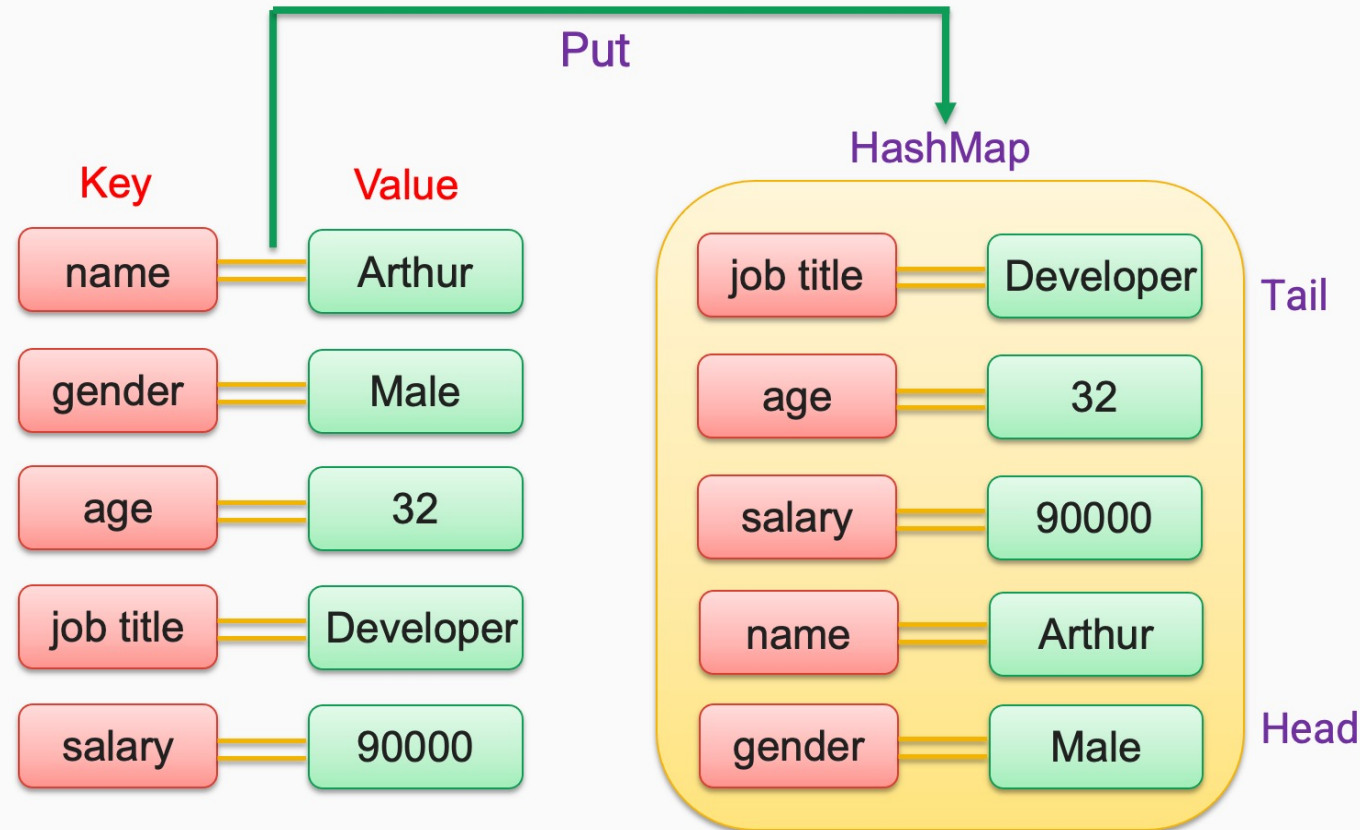| Key | Value |
|-----|-------|
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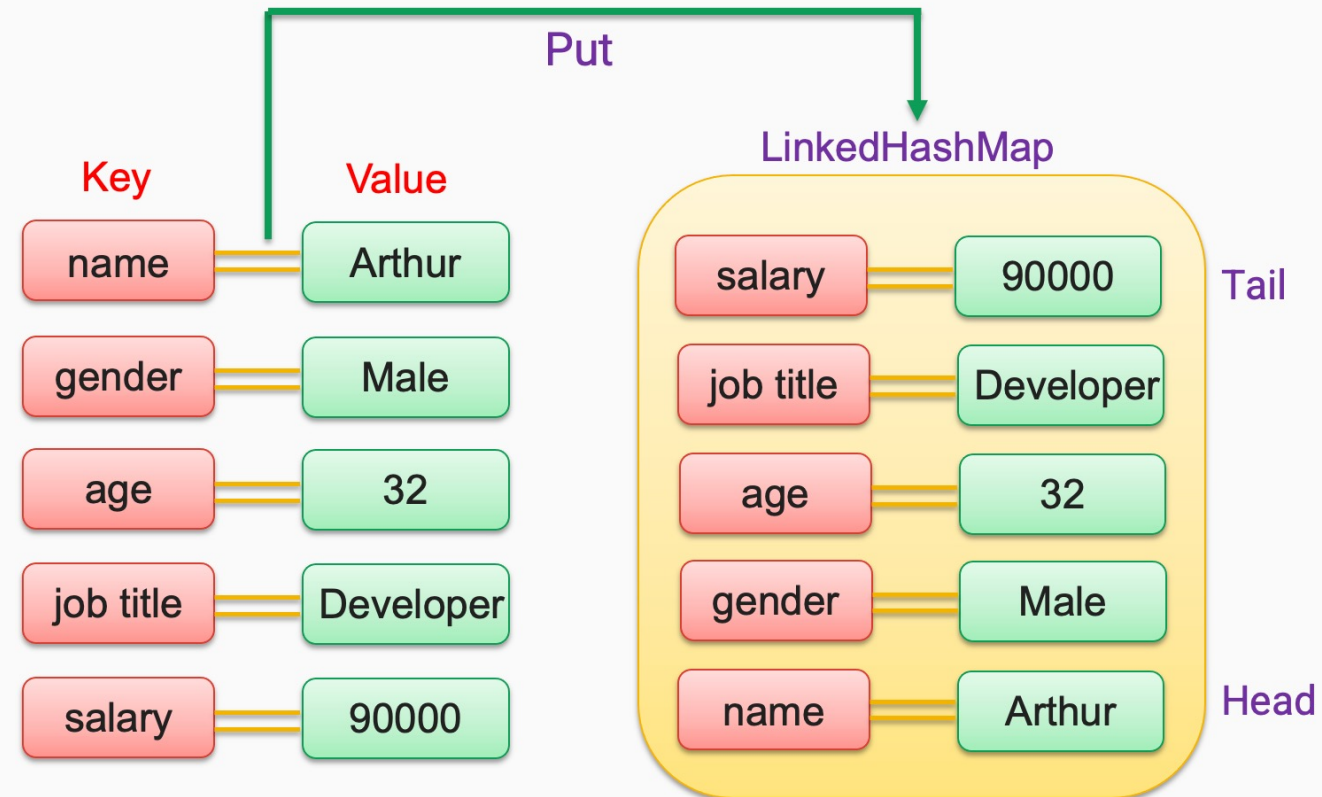# Map Hierarchy

# HashMap Class

- Implements the Map interface

- Maintains the random order

- Accepts null value as a key

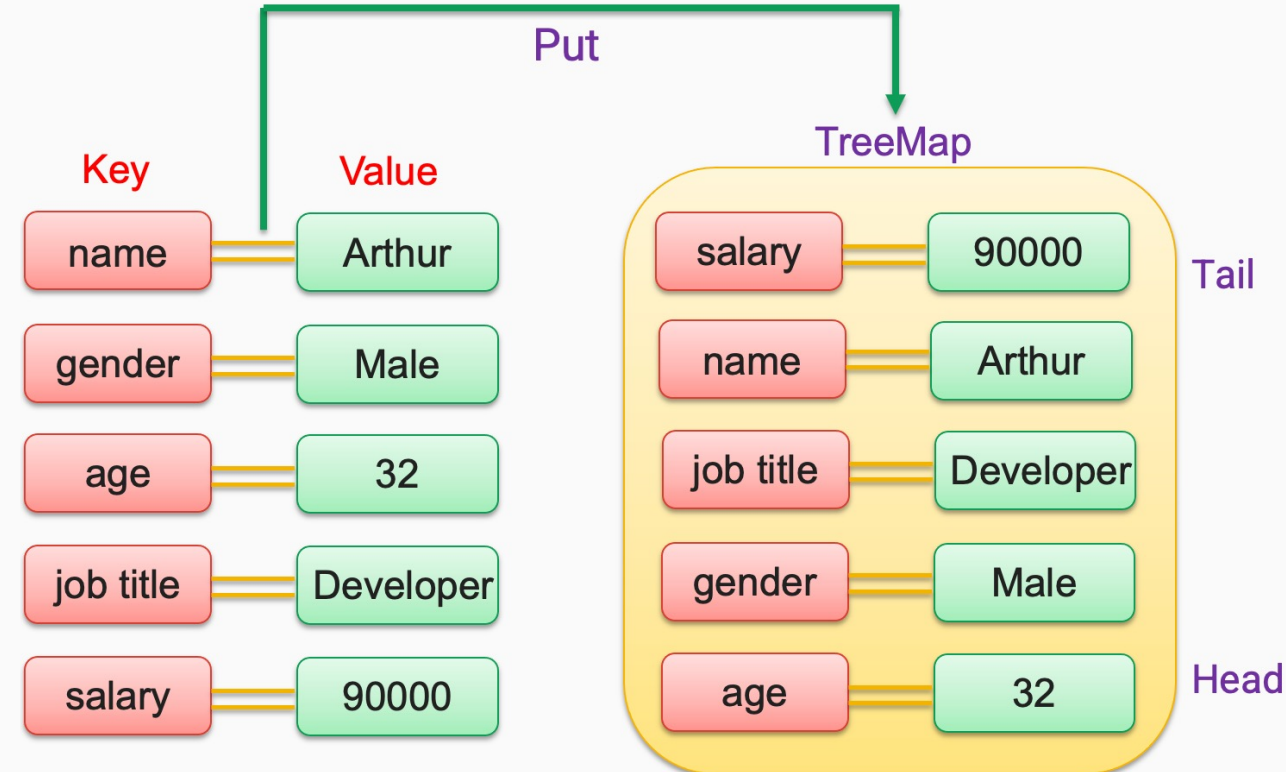```
import java.util.HashMap;
```

# LinkedHashMap Class

- Child class of HashMap

- Maintains the insertion order

- Accepts null value as a key

```
import java.util.LinkedHashMap;
```
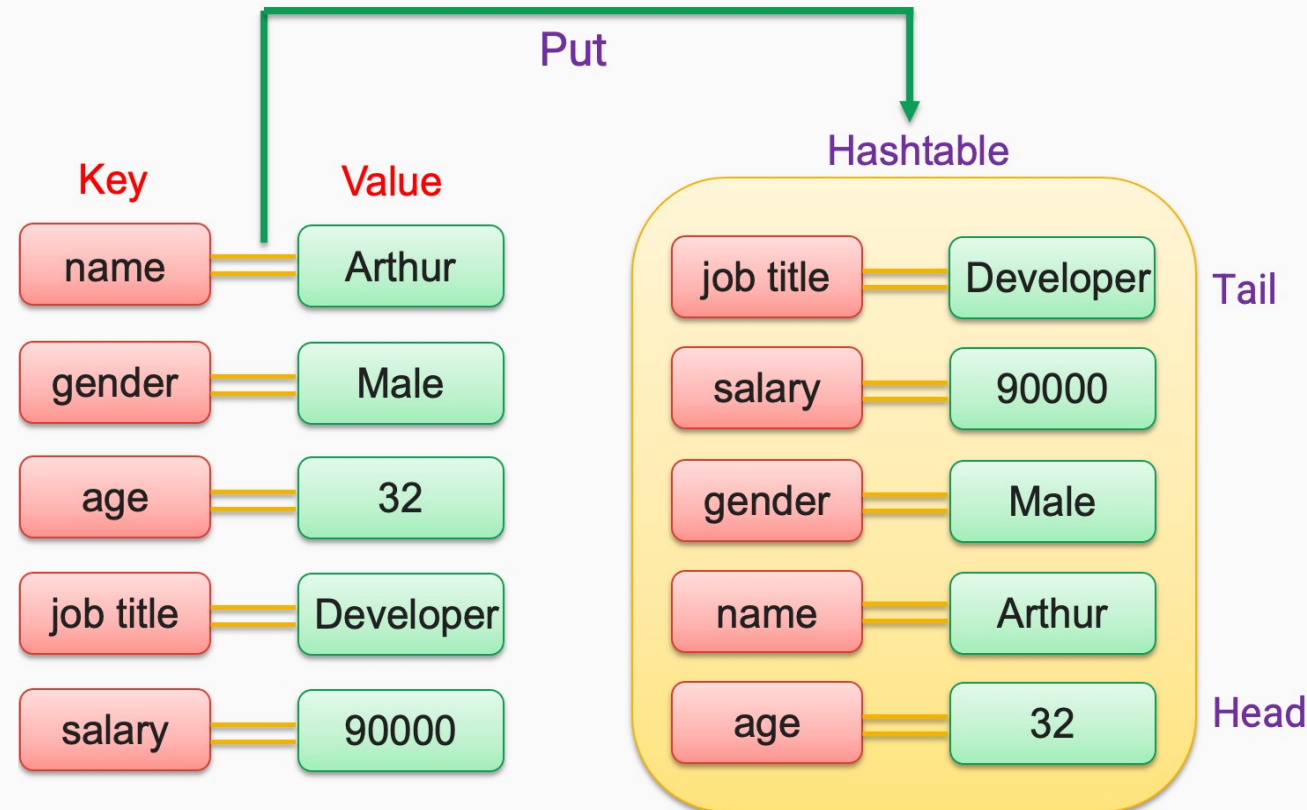
# TreeMap Class

- Implements the SortedMap Interface

- Maintains the sorted (Ascending) order

- Does not accept null as a key

```
import java.util.TreeMap;
```

# Hashtable Class

- Implements the Map interface

- Maintains the random order

- Does not accept null as a key or **values**

- Synchronized (Thread-Safe)

```
import java.util.Hashtable;
```

# HashMap vs LinkedHashMap vs Hashtable vs TreeMap

| HashMap | LinkedHashMap | TreeMap | Hashtable |
|---|---|---|---|
| Not synchronized | Not synchronized | Not synchronized | Synchronized |
| allows one null key and multiple null values | allows one null key and multiple null values | does not allow any null key but allows null values | does not allow any null key or null value |
| Maintains the random order | Maintains the insertion order | Maintains the sorted order | Maintains the random order |

CYDEO

# Methods Of Map

| Method | Method | Method |
|---|---|---|
| put() | get() | size() |
| replace() | remove() | containsKey() |
| containsValue() | isEmpty() | equals() |
| clear() | putAll() | keySet() |
| values() | entrySet() | getKey() |
| getValue() | setValue() | |