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Christoph Treude

Bimodal Software Documentation

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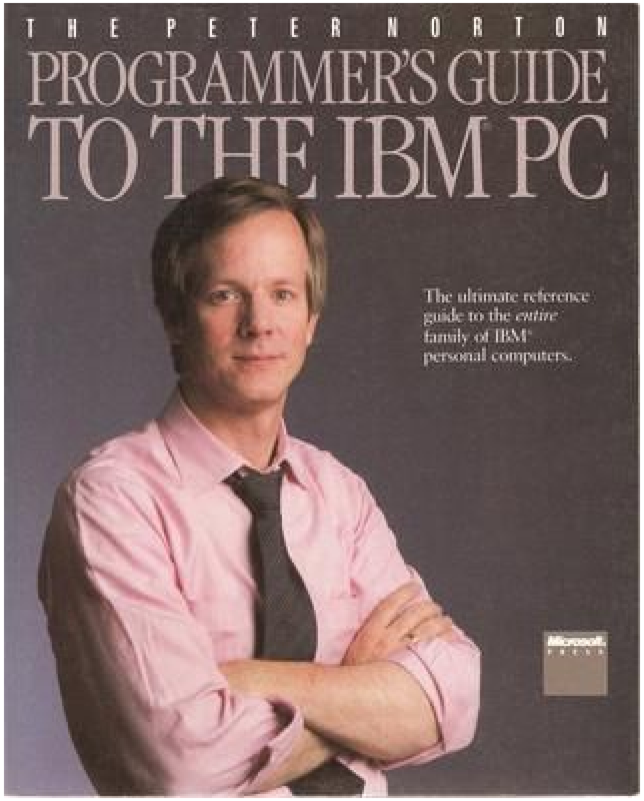
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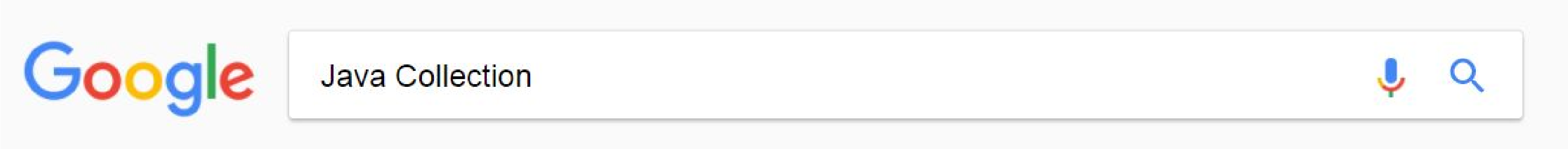

Java Collection

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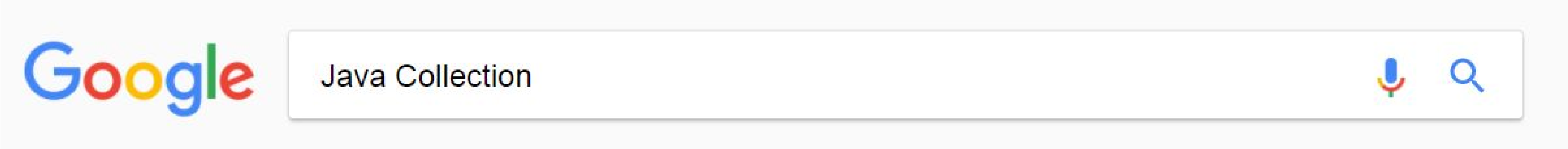

Java Collection

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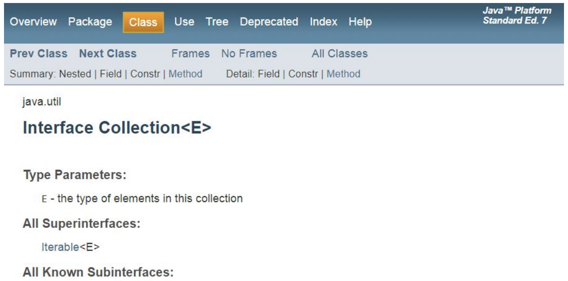

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java.util

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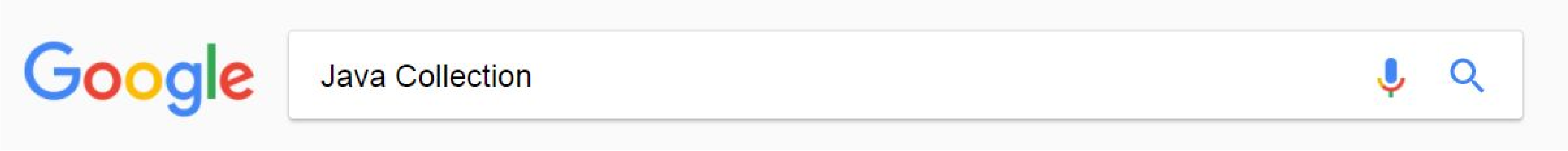

Java Collection

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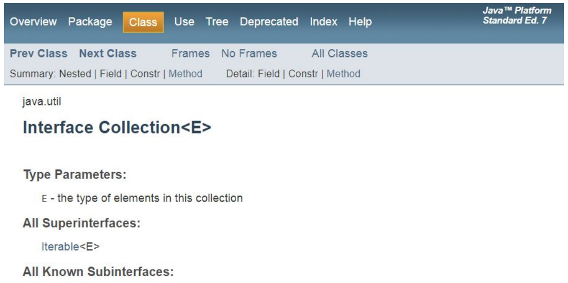
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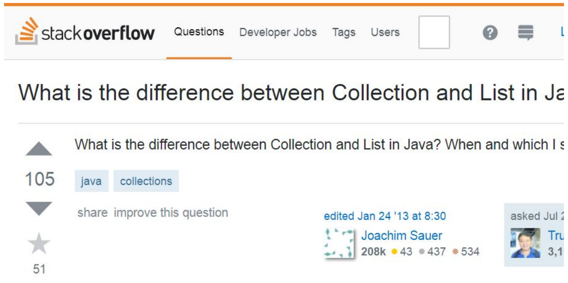

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Joachim Sauer

208k ●43 ●437 ●534

asked Jul 2

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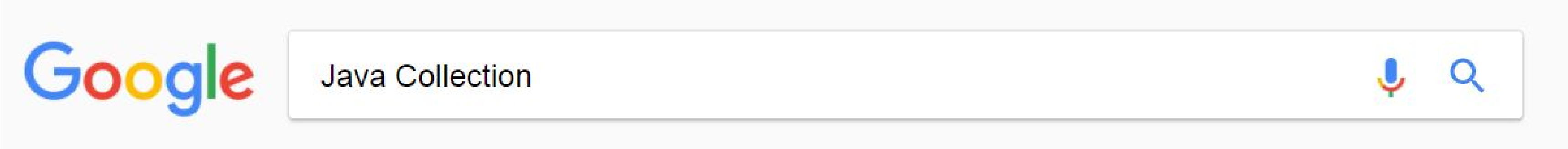

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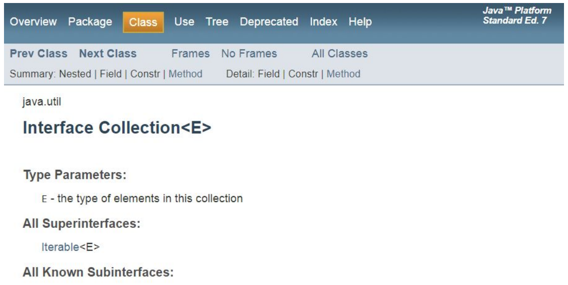
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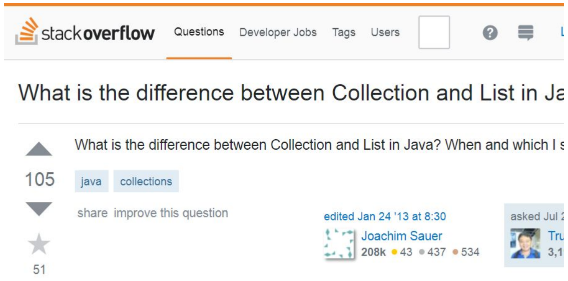
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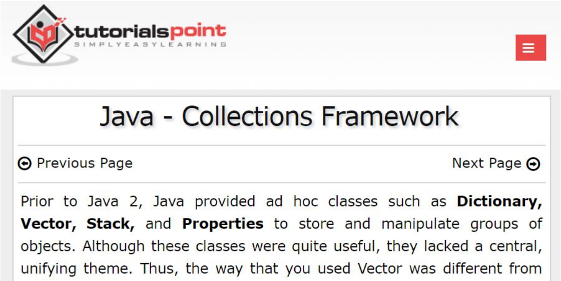

Java - Collections Framework

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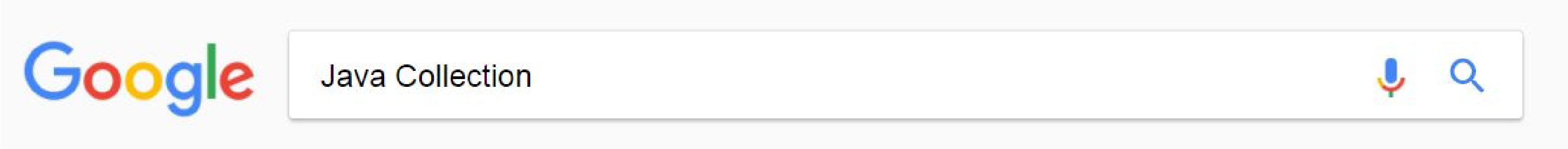

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Java Collection

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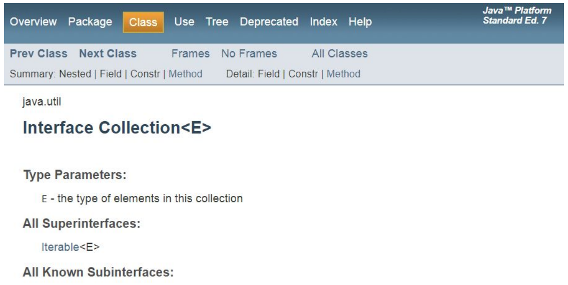

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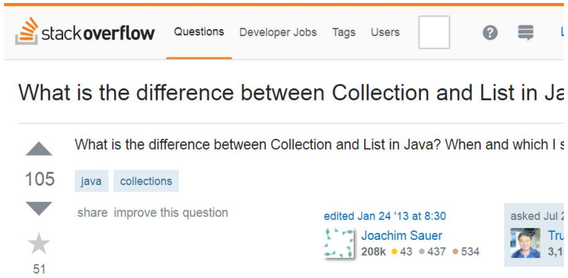

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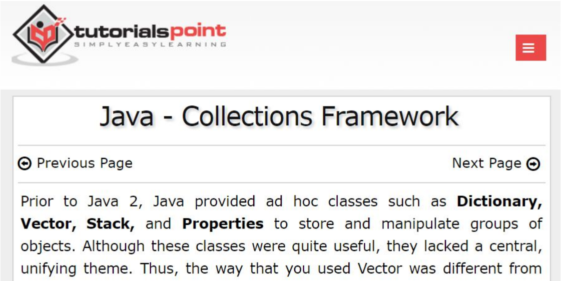

Java - Collections Framework

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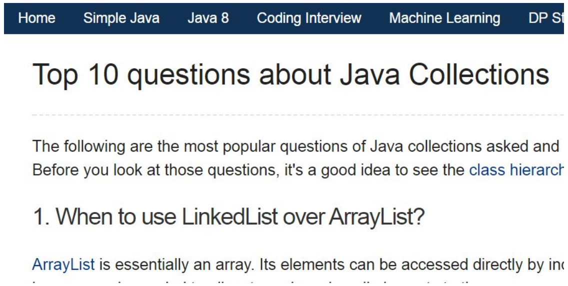

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Top 10 questions about Java Collections

The following are the most popular questions of Java collections asked and Before you look at those questions, it's a good idea to see the class hierarch

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ArrayList is essentially an array. Its elements can be accessed directly by inc

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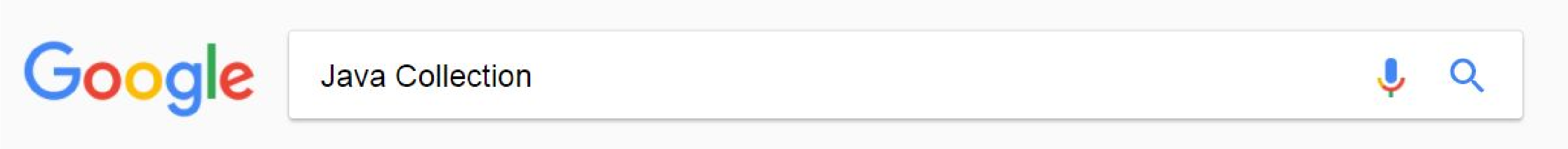
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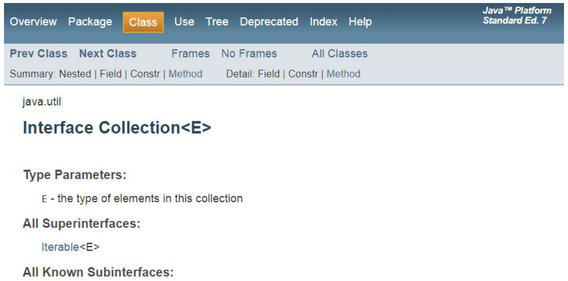
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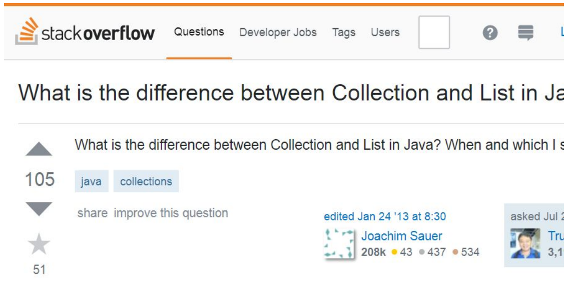

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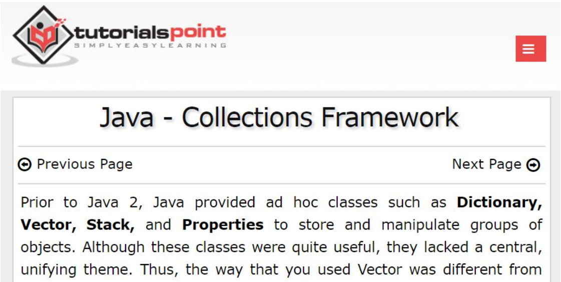

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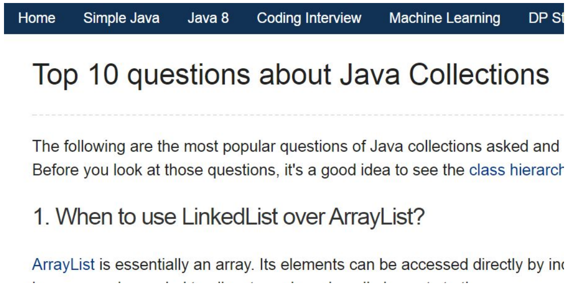
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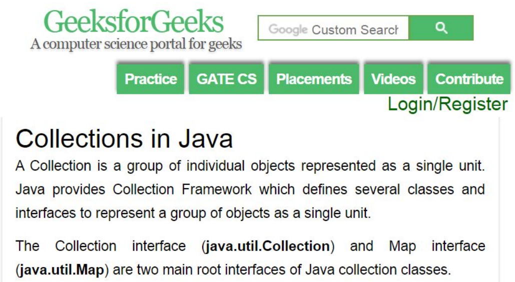

Collections in Java

A Collection is a group of individual objects represented as a single unit. Java provides Collection Framework which defines several classes and interfaces to represent a group of objects as a single unit.

The Collection interface (**java.util.Collection**) and Map interface (**java.util.Map**) are two main root interfaces of Java collection classes.

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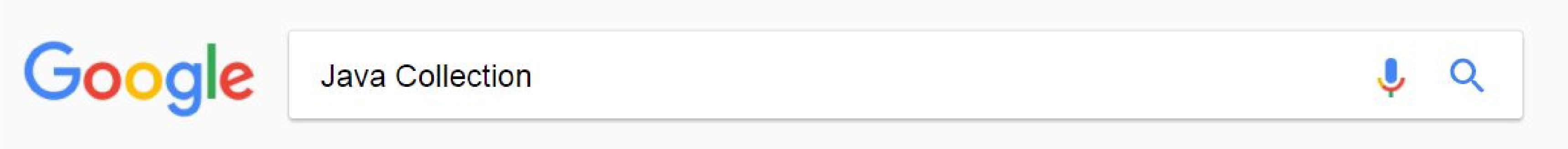

Java Collection

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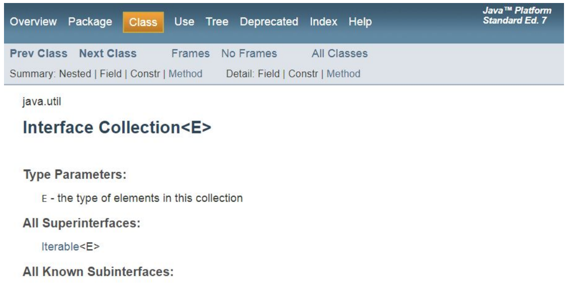

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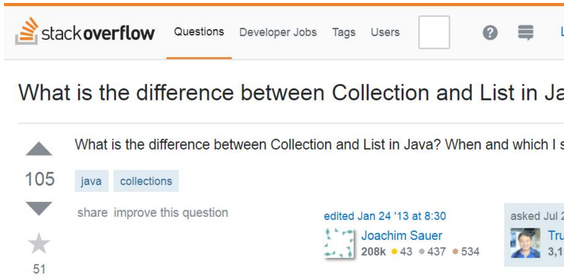

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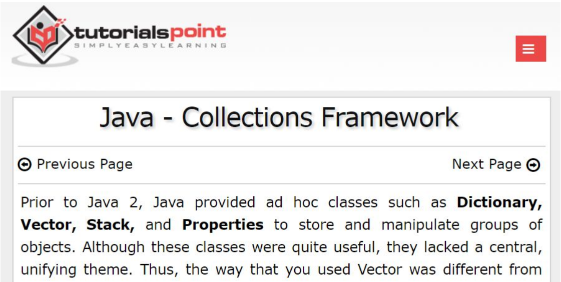

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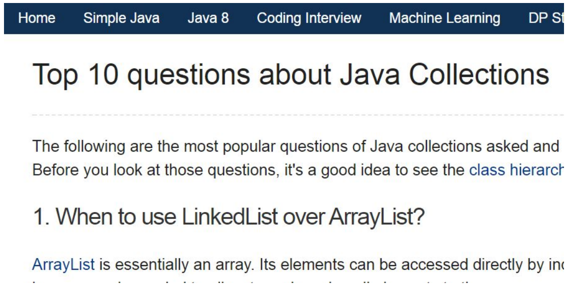

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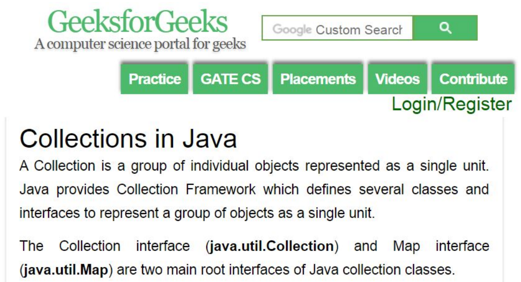

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162 different domains in the top 10 for 99 queries

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Tensorflow Python API: 309 different domains in the top 10 for 2,192 queries

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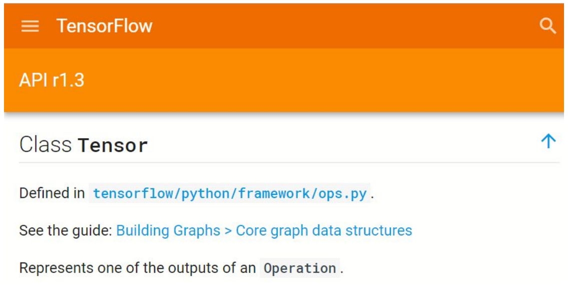

Class `Tensor`

Defined in `tensorflow/python/framework/ops.py` .

See the guide: Building Graphs > Core graph data structures

Represents one of the outputs of an `Operation` .

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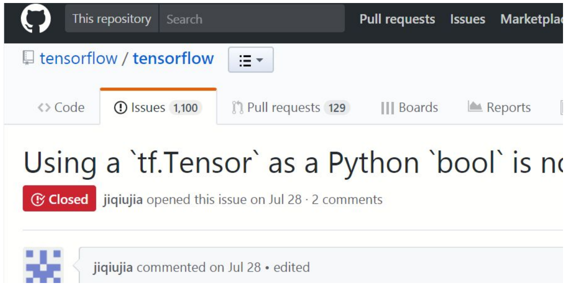

Using a `tf.Tensor` as a Python `bool` is nc

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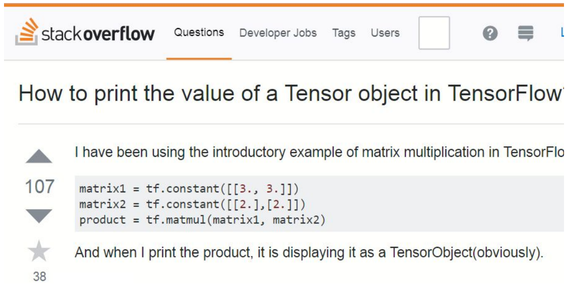

How to print the value of a Tensor object in TensorFlow

I have been using the introductory example of matrix multiplication in TensorFlo

```
matrix1 = tf.constant([[3., 3.]])
matrix2 = tf.constant([[2.],[2.]])
product = tf.matmul(matrix1, matrix2)
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And when I print the product, it is displaying it as a TensorObject(obviously).

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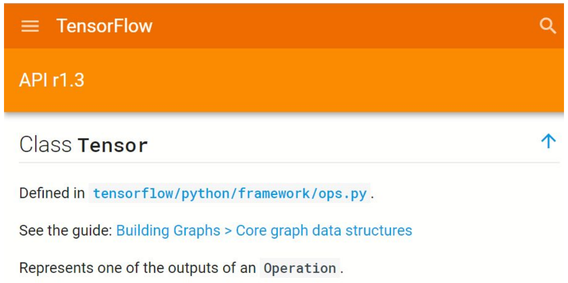

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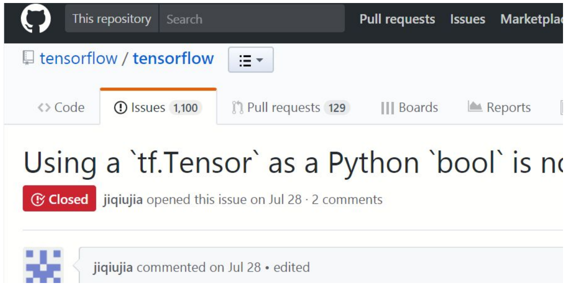

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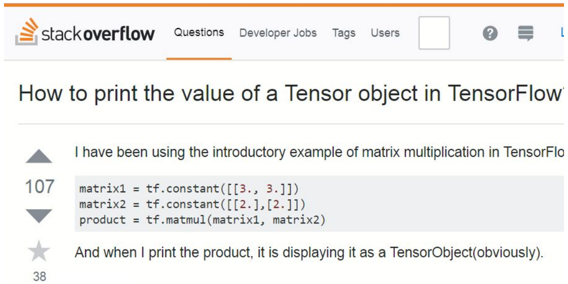

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jQuery Event API: 75 different domains in the top 10 for 57 queries

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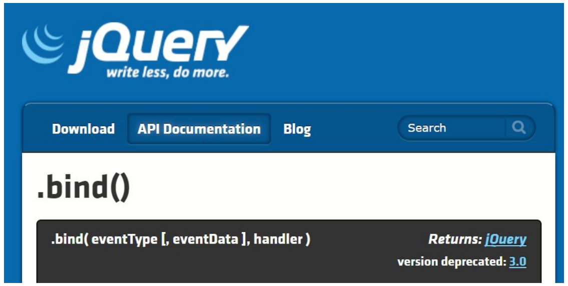


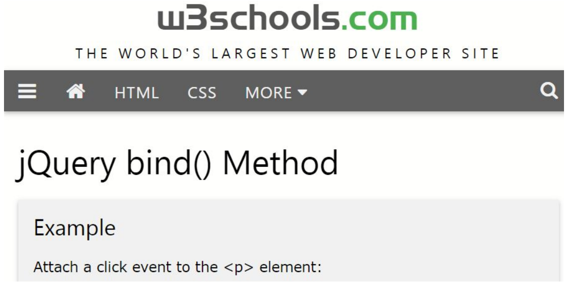
.bind()

.bind(eventType [, eventData], handler)

Returns: jQuery

version deprecated: 3.0

100%

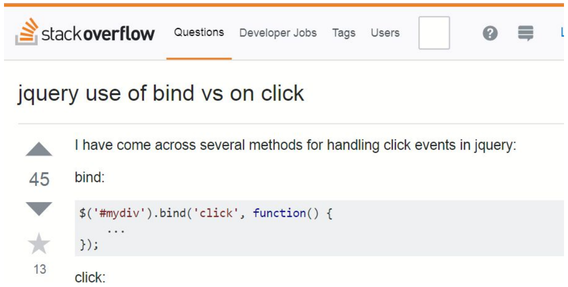


jQuery bind() Method

Example

Attach a click event to the <p> element:

98%



jquery use of bind vs on click

I have come across several methods for handling click events in jquery:

bind:

```
$('#mydiv').bind('click', function() {
    ...
});
```

click:

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Navigating documentation is not trivial

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Common Tasks

- Link
- Link
- Link
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- Link
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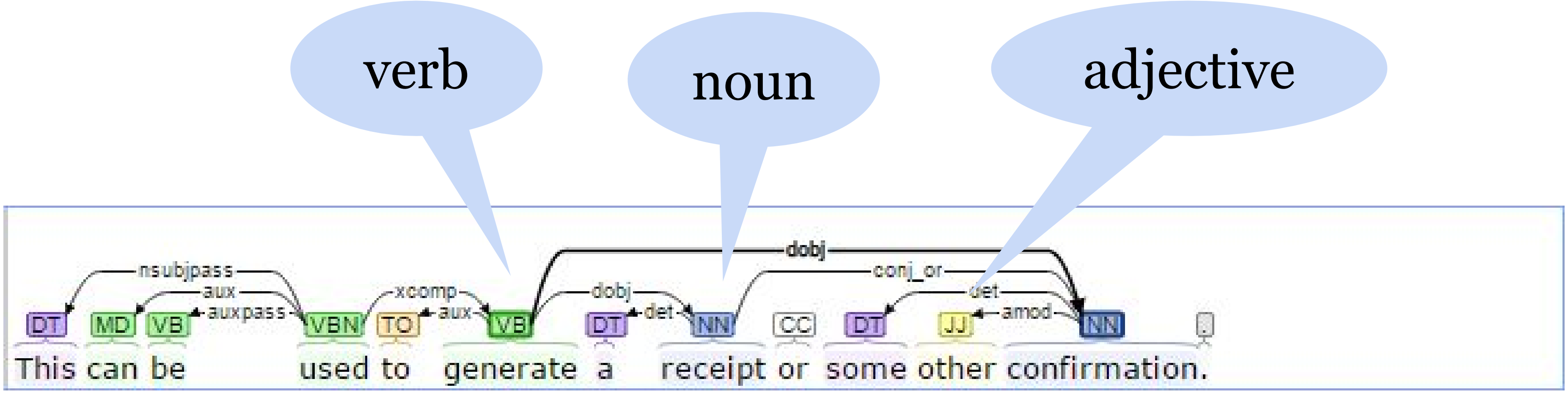
- Link

Extracting tasks from documentation



verb

noun

adjective

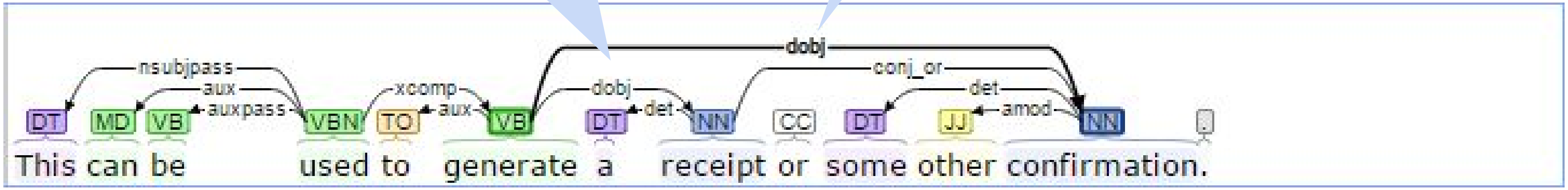
This can be used to generate a receipt or some other confirmation.

[C. Treude, M. P. Robillard, and B. Dagenais. Extracting Development Tasks to Navigate Software Documentation. IEEE Trans. on Software Engineering, 41, 6, p. 565-581]

Grammatical dependencies

direct object:
generate
confirmation

direct object:
generate receipt



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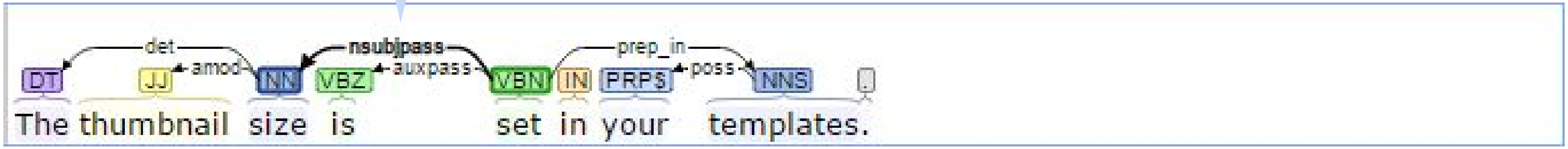
Grammatical dependencies

passive nominal subject: set size



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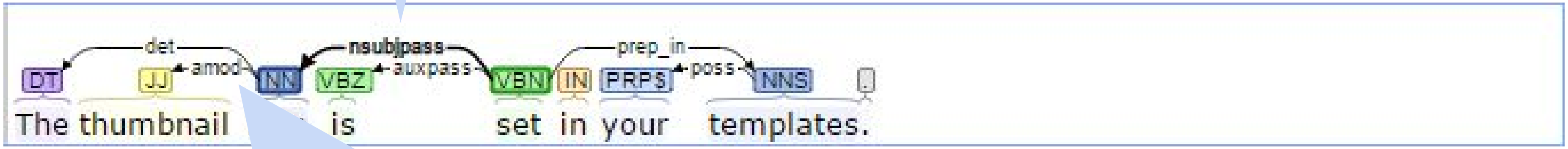

adjective modifier: set thumbnail size

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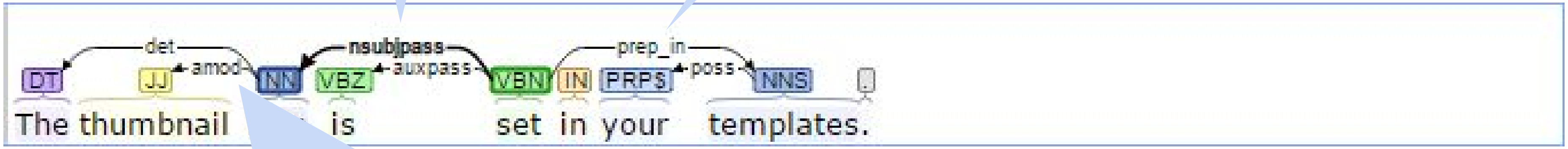
Grammatical dependencies

preposition: set thumbnail size in templates

passive nominal subject: set size



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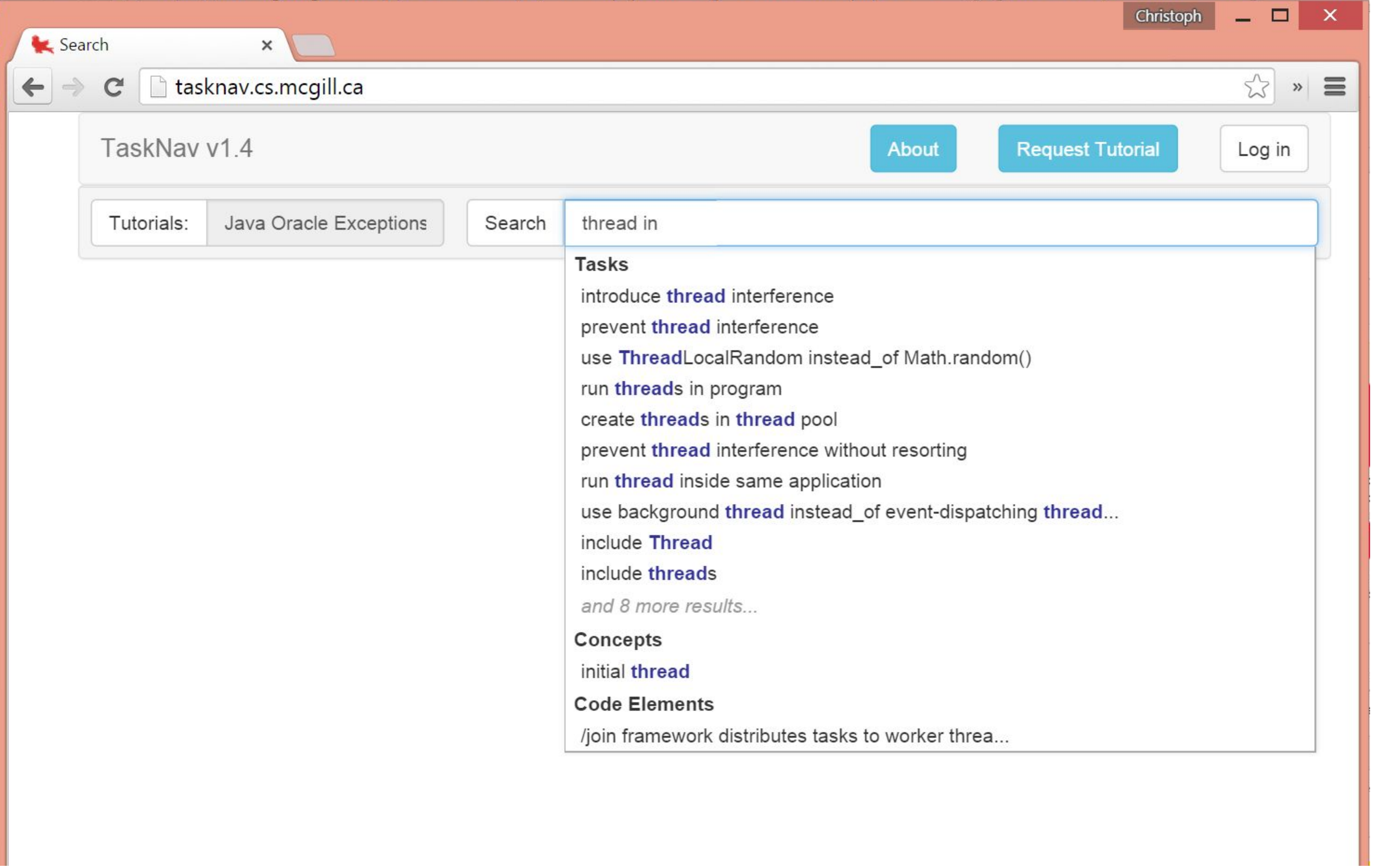


thread in

Tasks

introduce **thread** interference
prevent **thread** interference
use **Thread**LocalRandom instead_of Math.random()
run **threads** in program
create **threads** in **thread** pool
prevent **thread** interference without resorting
run **thread** inside same application
use background **thread** instead_of event-dispatching **thread**...
include **Thread**
include **threads**
and 8 more results...

Concepts

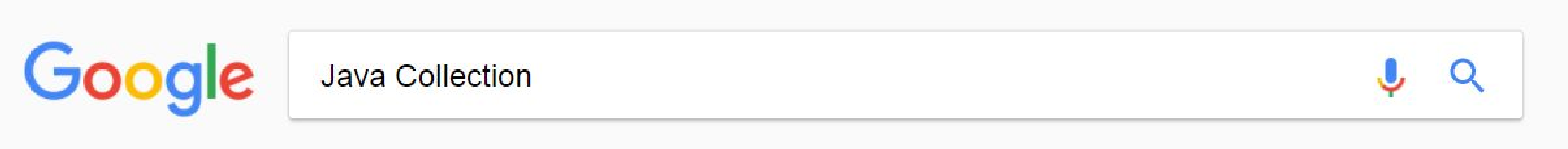
initial **thread**

Code Elements

/join framework distributes tasks to worker threa...

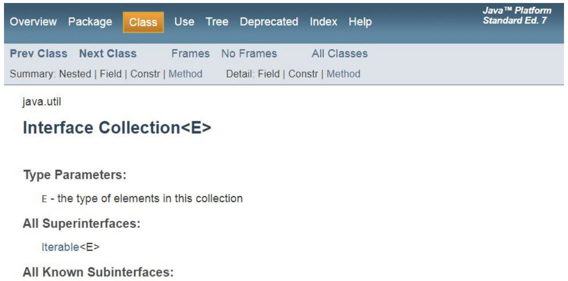
[C. Treude, M. Sicard, M. Klocke, and M. P. Robillard. TaskNav: Task-based Navigation of Software Documentation. ICSE '15: 37th Int'l. Conf. on Software Engineering, p. 649-652]

Software Documentation is everywhere



Java Collection

100%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Java™ Platform Standard Ed. 7
Prev Class Next Class Frames No Frames All Classes
Summary: Nested | Field | Constr | Method Detail: Field | Constr | Method

java.util

Interface Collection<E>

Type Parameters:

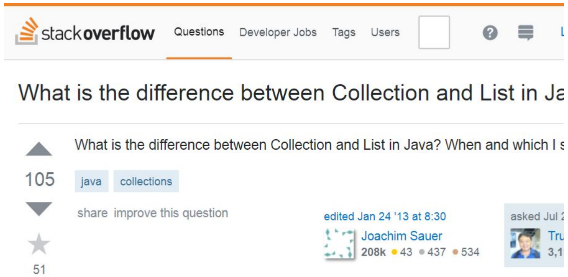
E - the type of elements in this collection

All Superinterfaces:

Iterable<E>

All Known Subinterfaces:

74%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java
collections
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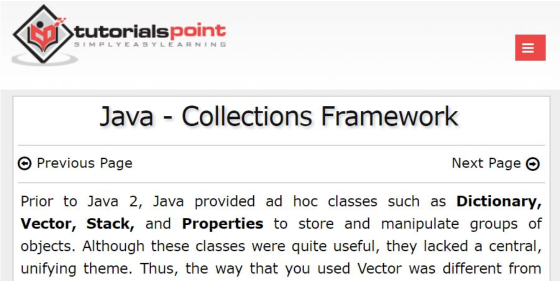
What is the difference between Collection and List in Ja

What is the difference between Collection and List in Java? When and which I s

edited Jan 24 '13 at 8:30
Joachim Sauer
208k ●43 ●437 ●534

asked Jul 2
Tru
3,1

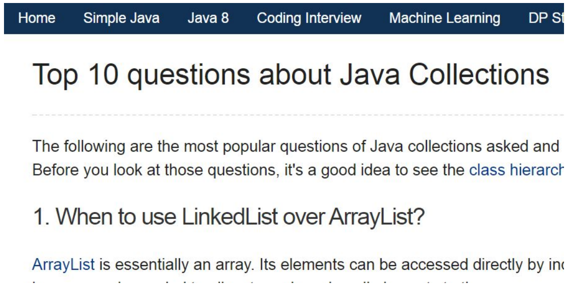
59%



Java - Collections Framework

Prior to Java 2, Java provided ad hoc classes such as **Dictionary, Vector, Stack,** and **Properties** to store and manipulate groups of objects. Although these classes were quite useful, they lacked a central, unifying theme. Thus, the way that you used Vector was different from

44%


Home Simple Java Java 8 Coding Interview Machine Learning DP St

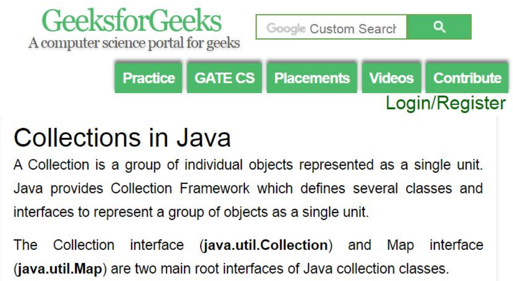
Top 10 questions about Java Collections

The following are the most popular questions of Java collections asked and Before you look at those questions, it's a good idea to see the class hierarch

1. When to use LinkedList over ArrayList?

ArrayList is essentially an array. Its elements can be accessed directly by inc

37%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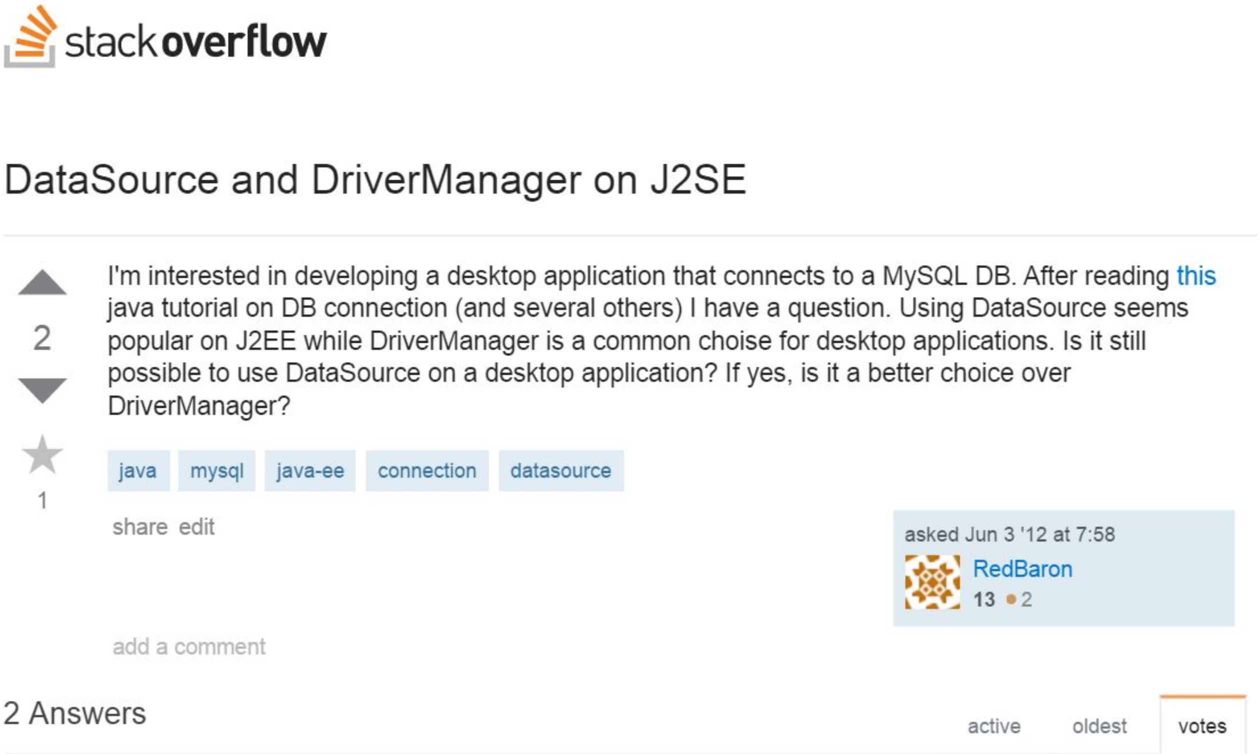
Collections in Java

A Collection is a group of individual objects represented as a single unit. Java provides Collection Framework which defines several classes and interfaces to represent a group of objects as a single unit.

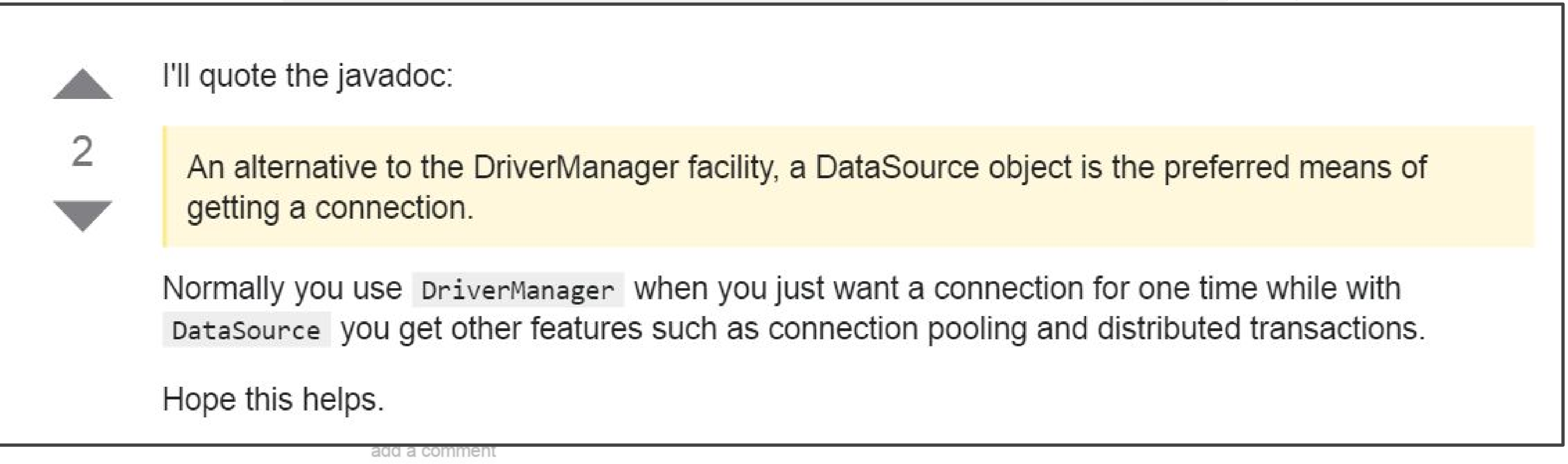
The Collection interface (**java.util.Collection**) and Map interface (**java.util.Map**) are two main root interfaces of Java collection classes.

[C. Parnin and C. Treude. Measuring API Documentation on the Web. Web2SE '11: 2nd Int'l. Workshop on Web 2.0 for Software Engineering, p. 25-30]



DataSource and DriverManager on J2SE

I'm interested in developing a desktop application that connects to a MySQL DB. After reading this java tutorial on DB connection (and several others) I have a question. Using DataSource seems popular on J2EE while DriverManager is a common choise for desktop applications. Is it still possible to use DataSource on a desktop application? If yes, is it a better choice over DriverManager?



I'll quote the javadoc:

> An alternative to the DriverManager facility, a DataSource object is the preferred means of getting a connection.

Normally you use `DriverManager` when you just want a connection for one time while with `DataSource` you get other features such as connection pooling and distributed transactions.

Hope this helps.

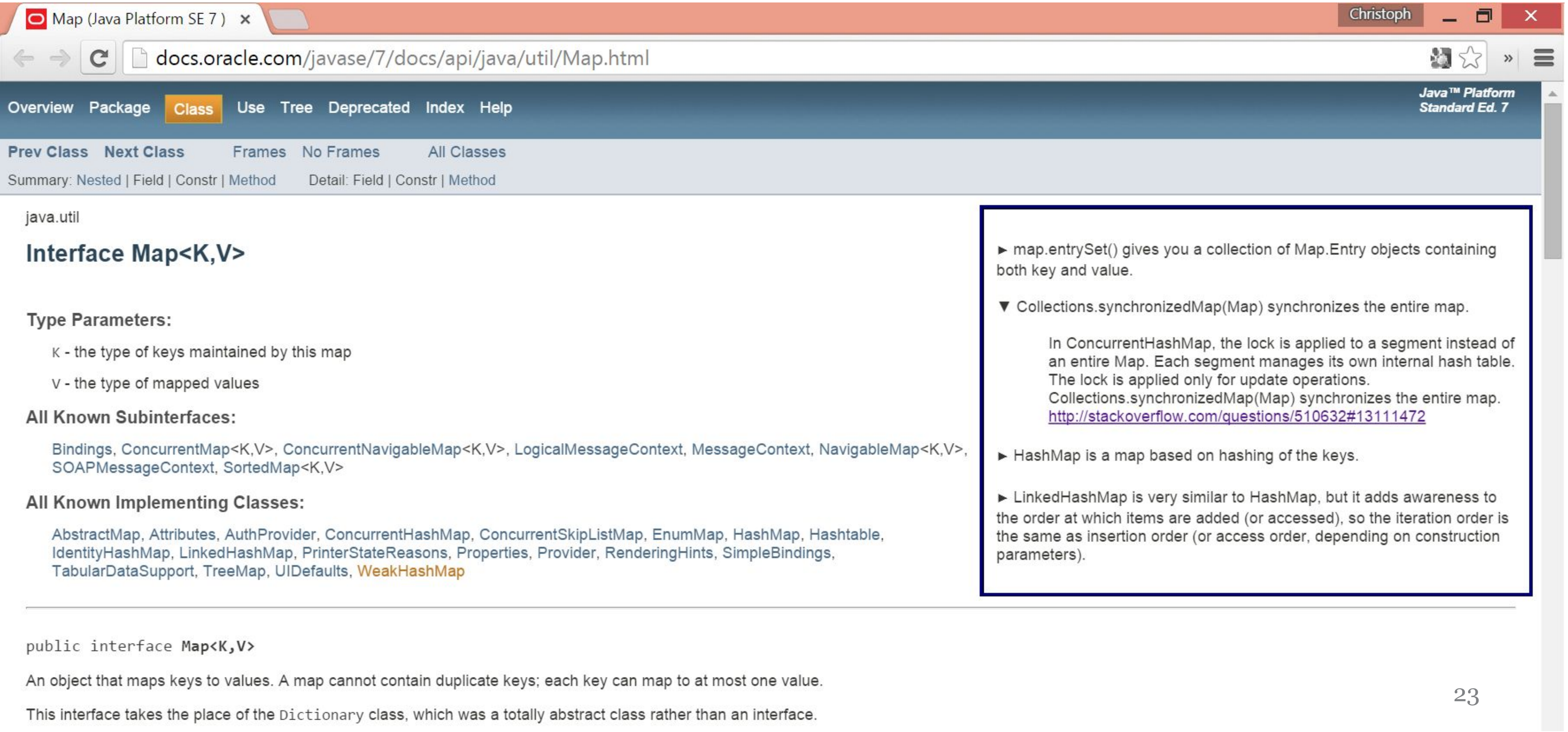
[C. Treude and M. P. Robillard. Augmenting API Documentation with Insights from Stack Overflow. ICSE '16: 38th Int'l. Conference on Software Engineering, p. 392-403]

insight sentence

a sentence from Stack Overflow that is related to a particular API type and that provides insight not contained in the API documentation of that type

Supervised Insight Sentence Extractor

Augment API documentation with insights from Stack Overflow


Map (Java Platform SE 7)
Christoph
docs.oracle.com/javase/7/docs/api/java/util/Map.html
Overview
Package
Class
Use
Tree
Deprecated
Index
Help
Java™ Platform Standard Ed. 7
Prev Class
Next Class
Frames
No Frames
All Classes
Summary: Nested | Field | Constr | Method
Detail: Field | Constr | Method

java.util

Interface Map<K,V>

Type Parameters:

K - the type of keys maintained by this map

V - the type of mapped values

All Known Subinterfaces:

Bindings, ConcurrentMap<K,V>, ConcurrentNavigableMap<K,V>, LogicalMessageContext, MessageContext, NavigableMap<K,V>, SOAPMessageContext, SortedMap<K,V>

All Known Implementing Classes:

AbstractMap, Attributes, AuthProvider, ConcurrentHashMap, ConcurrentSkipListMap, EnumMap, HashMap, Hashtable, IdentityHashMap, LinkedHashMap, PrinterStateReasons, Properties, Provider, RenderingHints, SimpleBindings, TabularDataSupport, TreeMap, UIDefaults, WeakHashMap

```
public interface Map<K,V>
```

An object that maps keys to values. A map cannot contain duplicate keys; each key can map to at most one value.

This interface takes the place of the Dictionary class, which was a totally abstract class rather than an interface.

► map.entrySet() gives you a collection of Map.Entry objects containing both key and value.

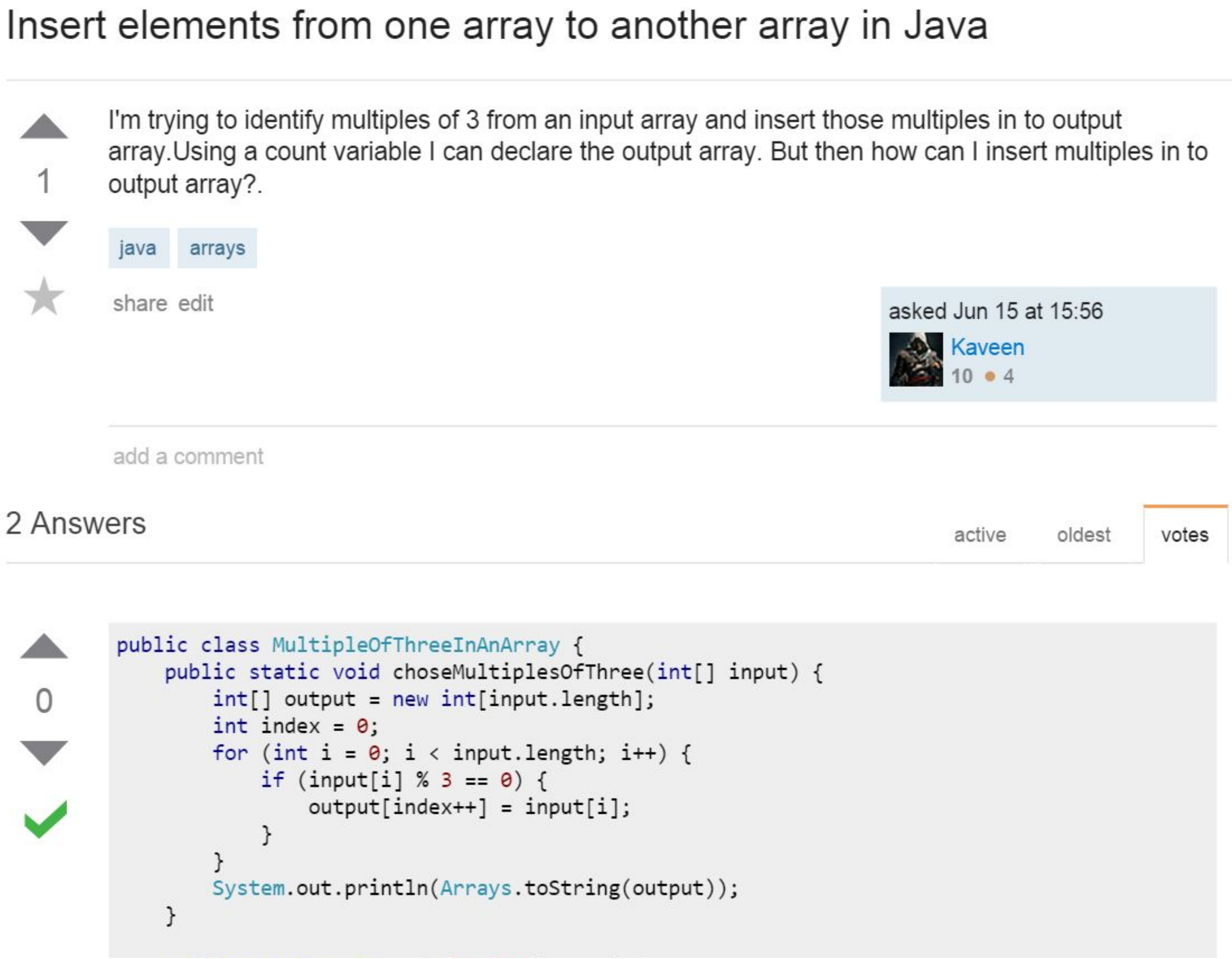
▼ Collections.synchronizedMap(Map) synchronizes the entire map.

In ConcurrentHashMap, the lock is applied to a segment instead of an entire Map. Each segment manages its own internal hash table. The lock is applied only for update operations. Collections.synchronizedMap(Map) synchronizes the entire map. http://stackoverflow.com/questions/510632#13111472

► HashMap is a map based on hashing of the keys.

► LinkedHashMap is very similar to HashMap, but it adds awareness to the order at which items are added (or accessed), so the iteration order is the same as insertion order (or access order, depending on construction parameters).

Bimodal software documentation



Insert elements from one array to another array in Java

1

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asked Jun 15 at 15:56
Kaveen
10 ● 4

2 Answers

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```
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        int[] output = new int[input.length];
        int index = 0;
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        }
        System.out.println(Arrays.toString(output));
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```

[B. A. Campbell and C. Treude. NLP2Code: Code Snippet Content Assist via Natural Language Tasks. ICSME '17: 33rd Int'l. Conf. on Software Maintenance and Evolution, to appear]

Challenges in Analyzing Documentation

- Software documentation is technical and often contains references to code elements
- Natural language text written by software developers may not obey all grammatical rules, e.g.,
  - sentences that are grammatically incomplete
  - content that has not authored by a native speaker

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

Comparing NLP libraries

CoreNLP

Returns the C++ variable.

SyntaxNet

Returns the C++ variable.

spaCy

Returns the C++ variable.

NLTK

Returns the C++ variable.

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

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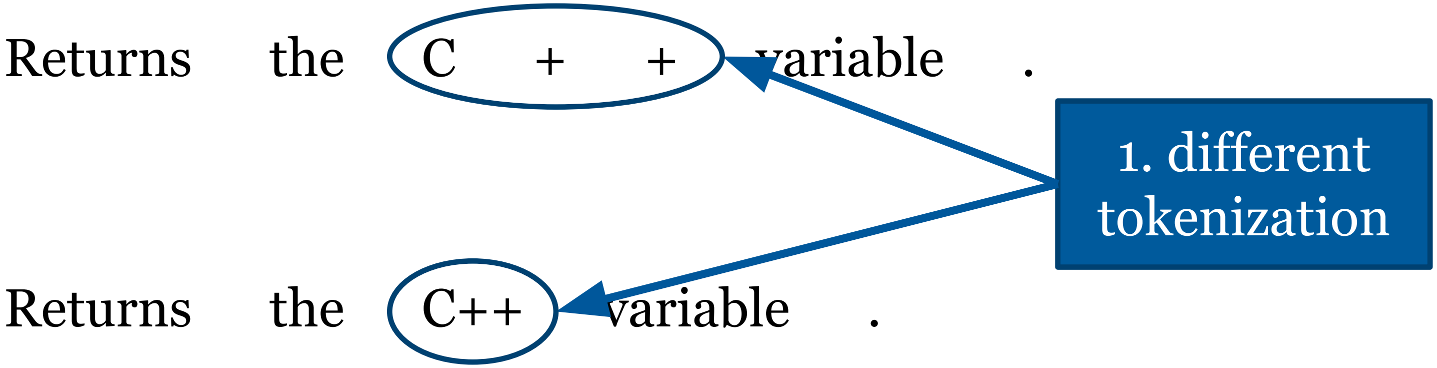

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1. different tokenization

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

Comparing NLP libraries

CoreNLP

Returns	the	C	+	+	variable	.
NNS	*DT*	*NN*	*JJ*	*CC*	*JJ*	.

1. different tokenization

SyntaxNet

Returns	the	C++	variable	.
VBZ	*DT*	*NNP*	*NN*	.

spaCy

Returns	the	C++	variable	.
VBZ	*DT*	*NNP*	*NN*	.

NLTK

Returns	the	C++	variable	.
NNS	*DT*	*NN*	*JJ*	.

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

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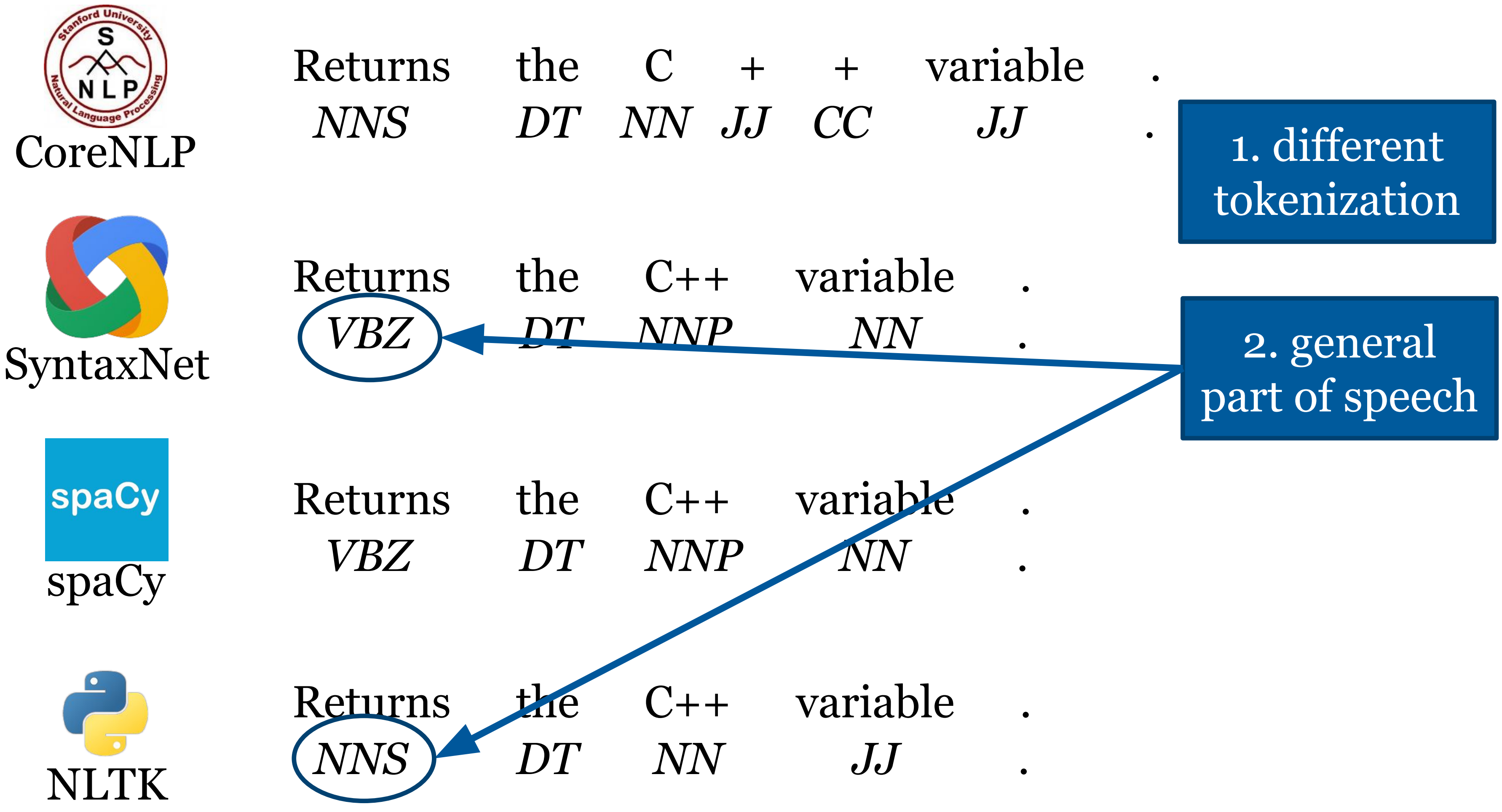

CoreNLP

Returns the C + + variable .

NNS DT NN JJ CC JJ .

SyntaxNet

Returns the C++ variable .

VBZ DT NNP NN .

spaCy

Returns the C++ variable .

VBZ DT NNP NN .

NLTK

Returns the C++ variable .

NNS DT NN JJ .

1. different tokenization

2. general part of speech

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

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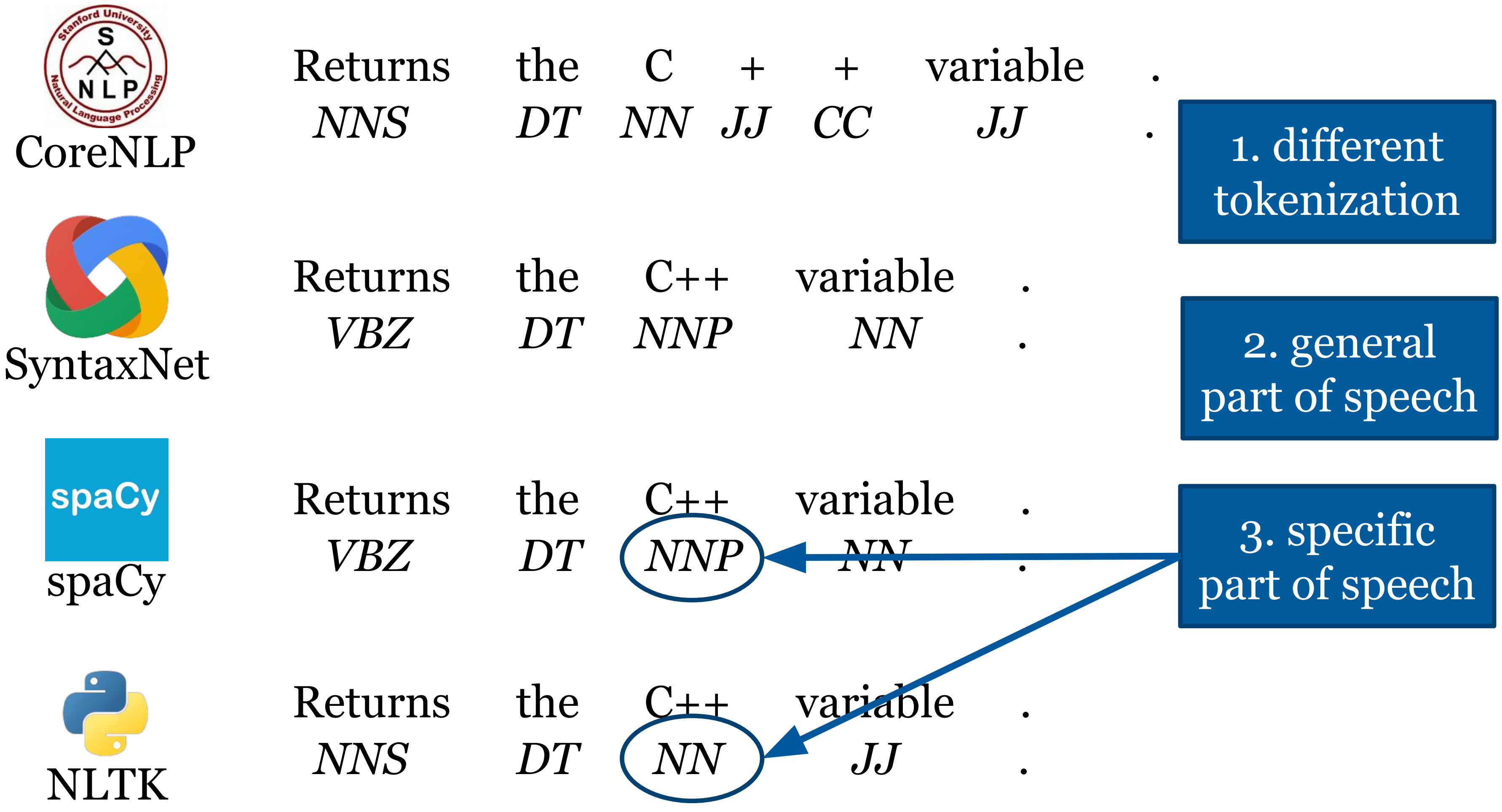

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NNS	*DT*	*NN*	*JJ*	*CC*	*JJ*	.

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1. different tokenization

2. general part of speech

3. specific part of speech

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Comparing NLP libraries

CoreNLP

SyntaxNet

spaCy

NLTK

Only between 60% and 71% of tokens from Stack Overflow, GitHub, and the Java API Documentation were assigned the same part-of-speech tag by all four libraries.

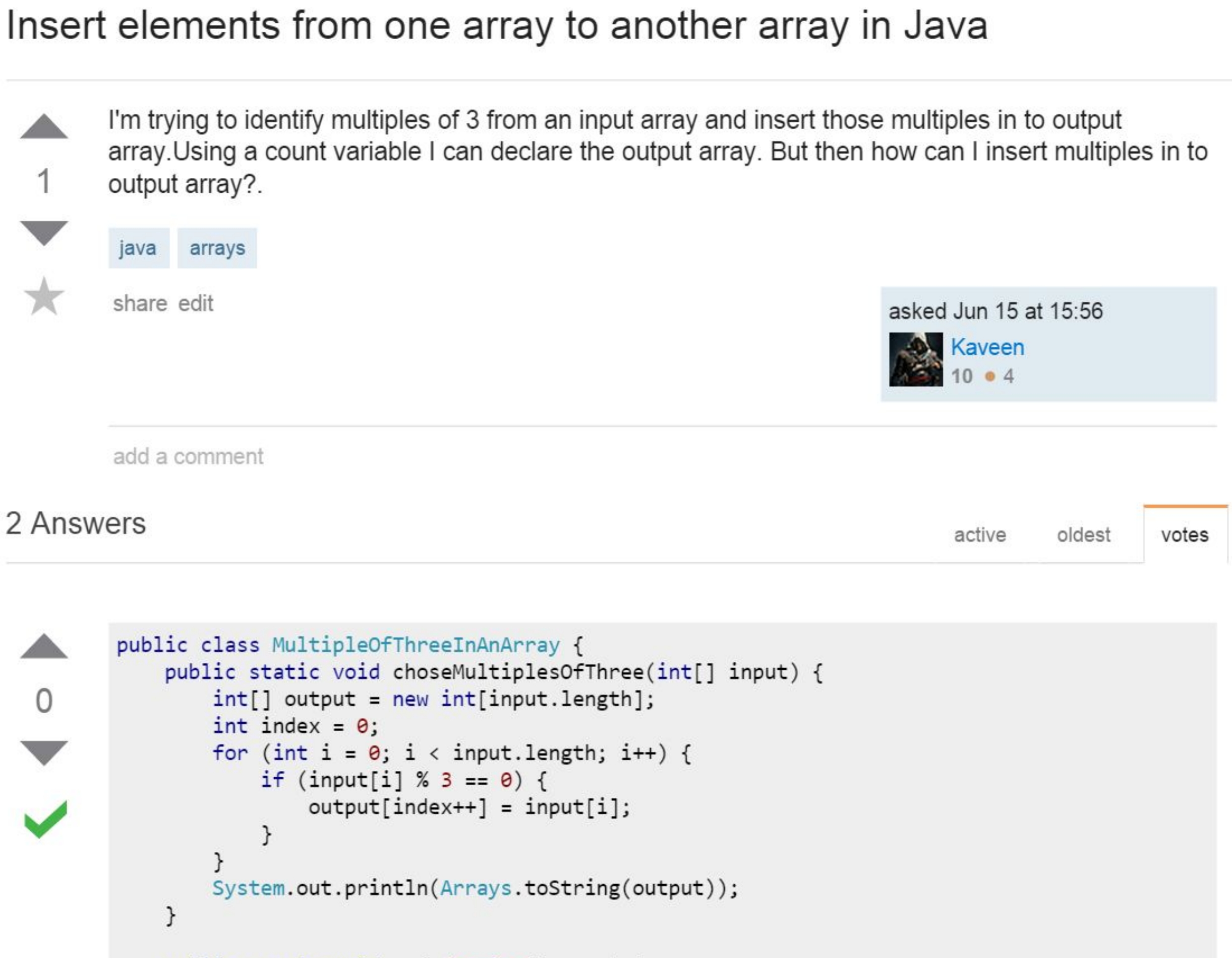
1. different tokenization

2. general part of speech

3. specific part of speech

[F. N. A. Al Omran and C. Treude. Choosing an NLP Library for Analyzing Software Documentation: A Systematic Literature Review and a Series of Experiments. MSR '17: 14th Int'l. Conf. on Mining Software Repositories, p. 187-197]

Bimodal software documentation



Insert elements from one array to another array in Java

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asked Jun 15 at 15:56

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2 Answers

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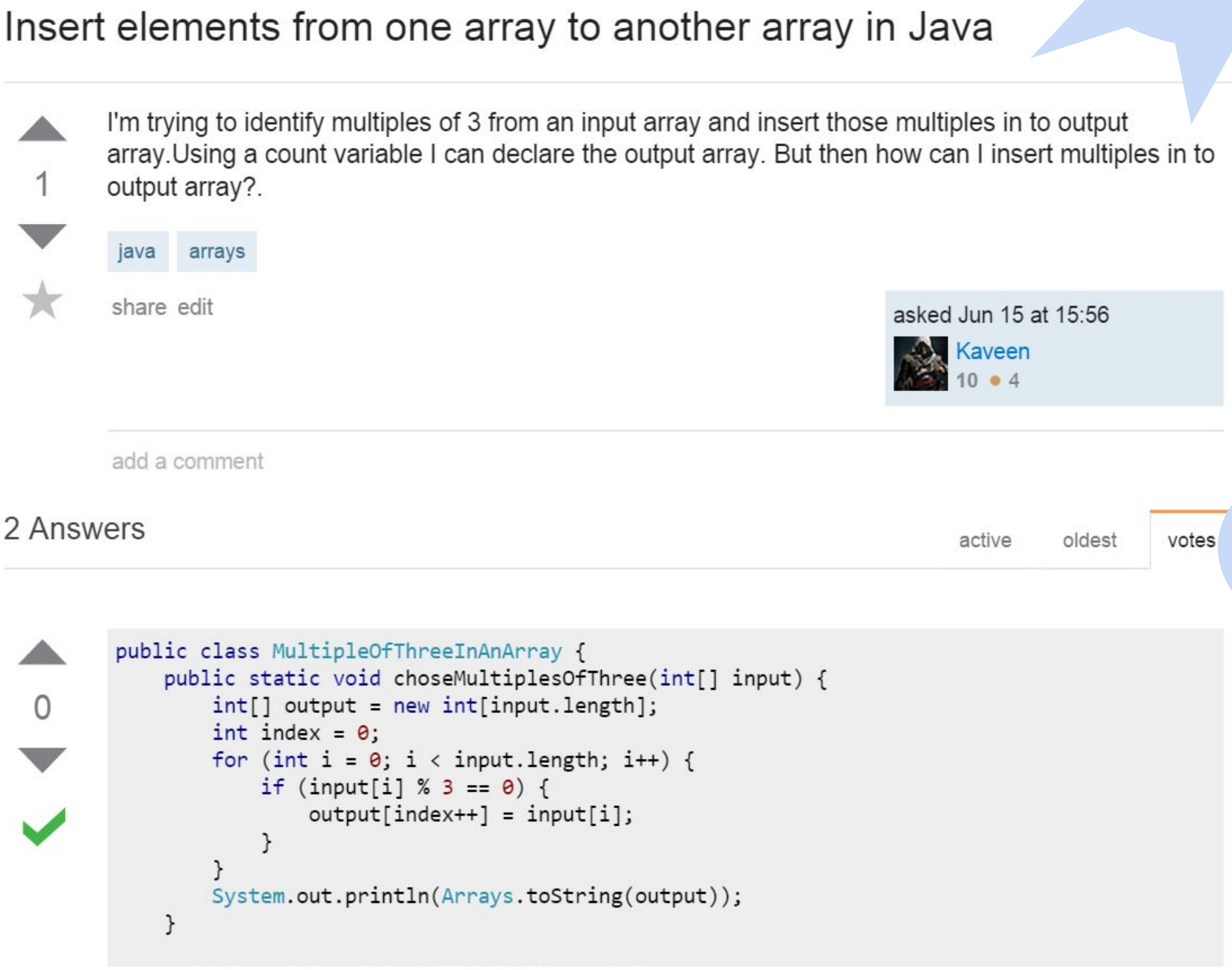
[B. A. Campbell and C. Treude. NLP2Code: Code Snippet Content Assist via Natural Language Tasks. ICSME '17: 33rd Int'l. Conf. on Software Maintenance and Evolution, to appear]

Bimodal software documentation

tasks



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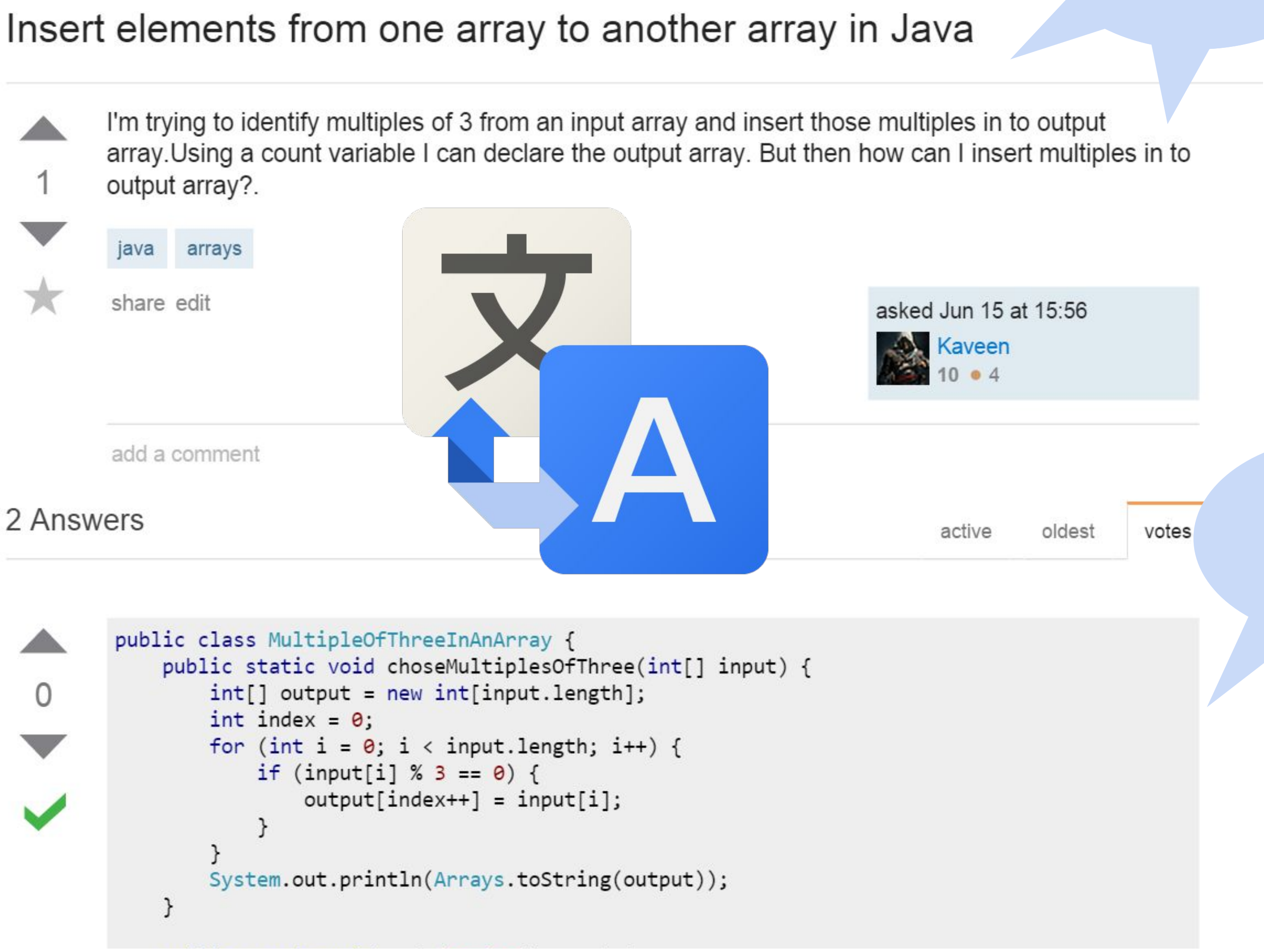
code

[B. A. Campbell and C. Treude. NLP2Code: Code Snippet Content Assist via Natural Language Tasks. ICSME '17: 33rd Int'l. Conf. on Software Maintenance and Evolution, to appear]

Code Snippet Content Assist

tasks



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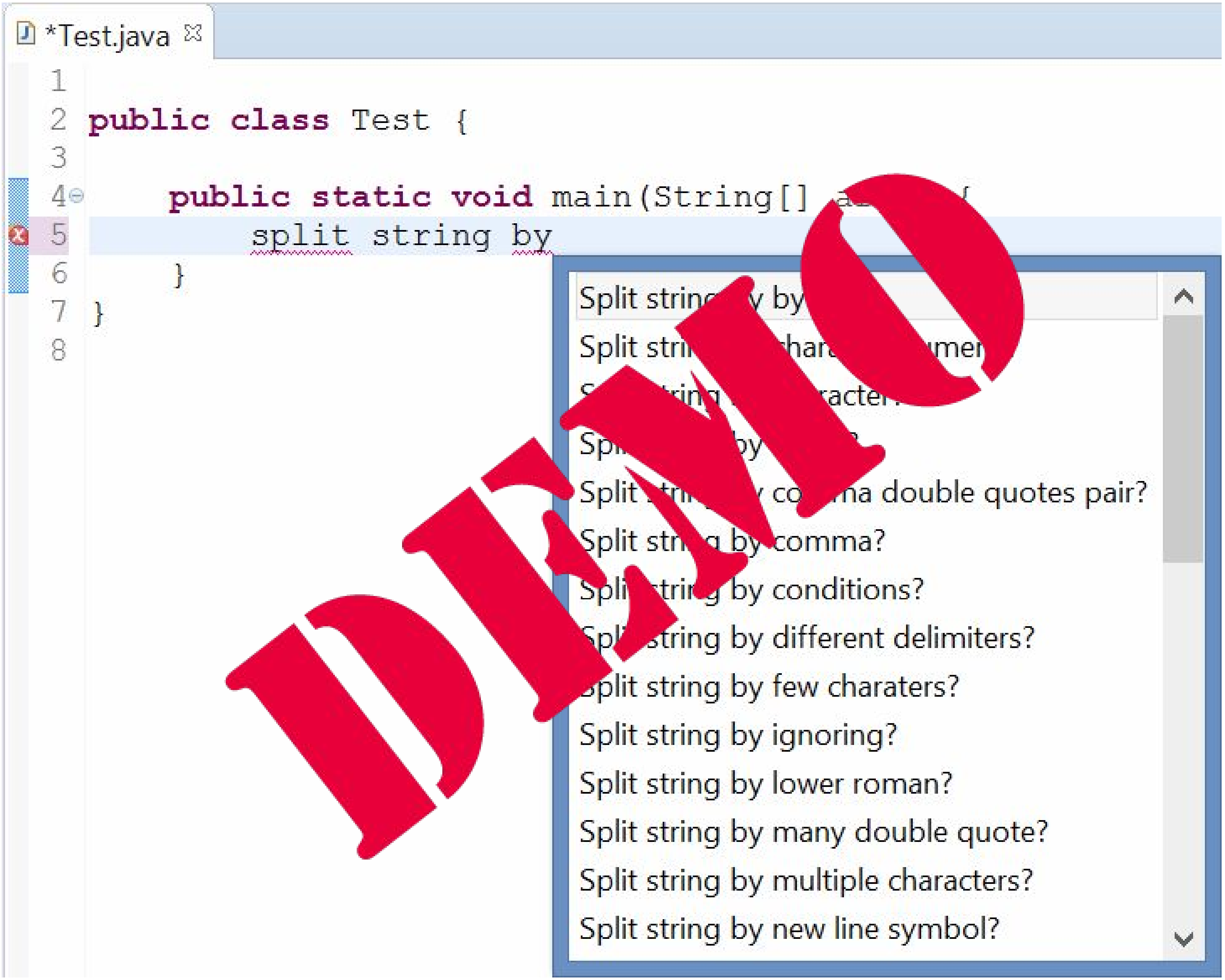


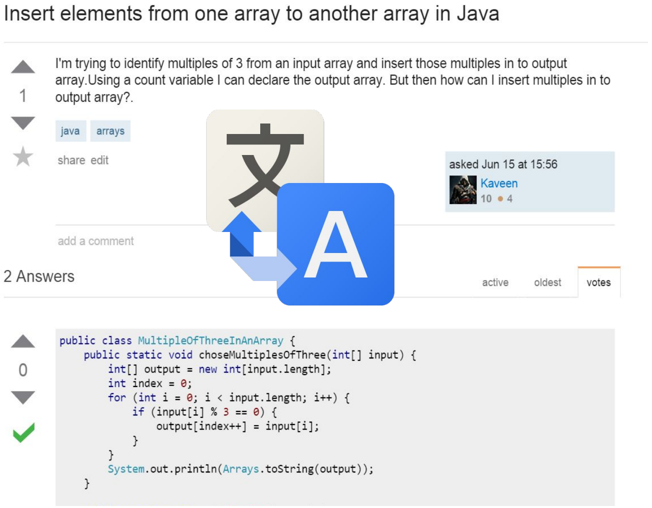
```
public class Test {

    public static void main(String[] a[illegible] {
        split string by
    }
}
```

- Split strin[illegible]y by
- Split stri[illegible]hara[illegible]mer
- S[illegible]tring [illegible]racter
- Sp[illegible] by [illegible]?
- Split [illegible] co[illegible]ma double quotes pair?
- Split str[illegible]g by comma?
- Spli[illegible]trin[illegible] by conditions?
- Spl[illegible]string by different delimiters?
- [illegible]plit string by few charaters?
- Split string by ignoring?
- Split string by lower roman?
- Split string by many double quote?
- Split string by multiple characters?
- Split string by new line symbol?

DEMO

[B. A. Campbell and C. Treude. NLP2Code: Code Snippet Content Assist via Natural Language Tasks. ICSME '17: 33rd Int'l. Conf. on Software Maintenance and Evolution, to appear]



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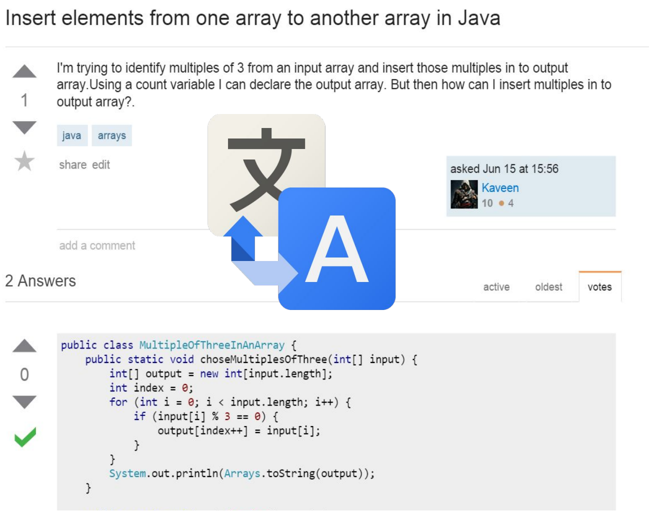
The integration of natural language and code in documentation



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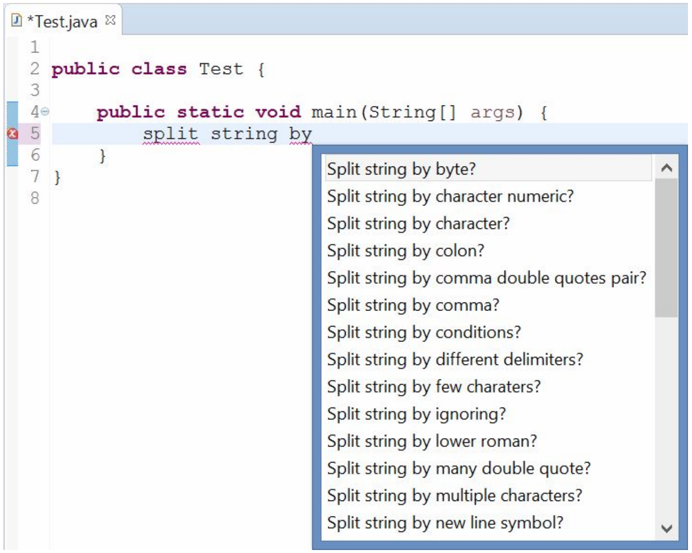
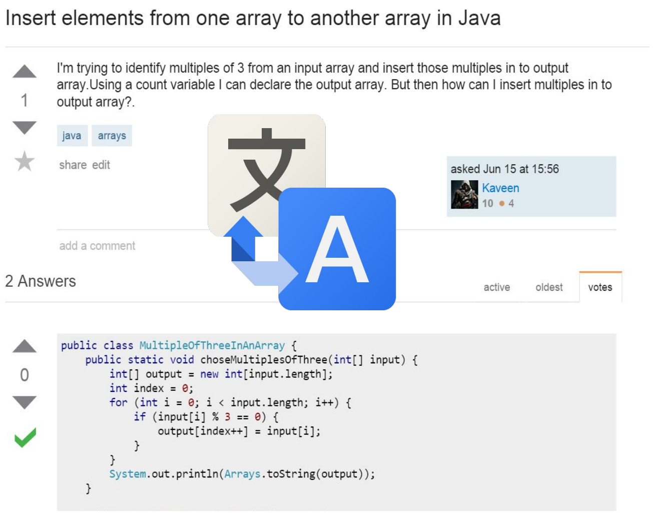


```java

public class Test {

    public static void main(String[] args) {
        split string by
    }
}

```

Split string by byte?
Split string by character numeric?
Split string by character?
Split string by colon?
Split string by comma double quotes pair?
Split string by comma?
Split string by conditions?
Split string by different delimiters?
Split string by few charaters?
Split string by ignoring?
Split string by lower roman?
Split string by many double quote?
Split string by multiple characters?
Split string by new line symbol?

creates challenges & opportunities for software engineering tools.



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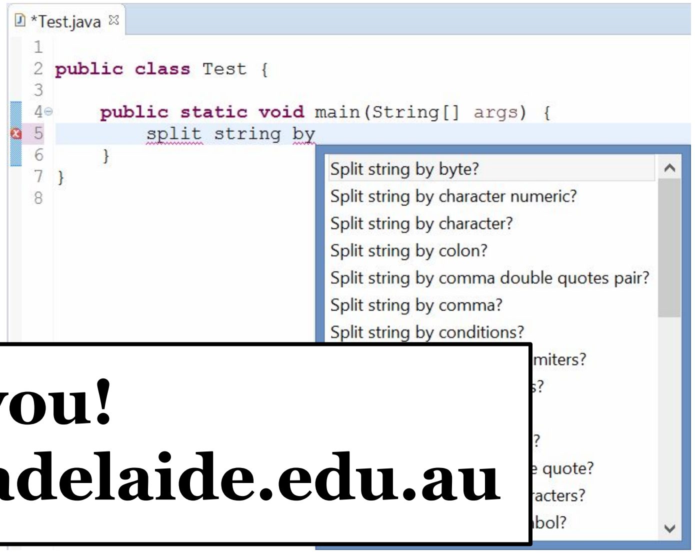

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Split string by byte?
Split string by character numeric?
Split string by character?
Split string by colon?
Split string by comma double quotes pair?
Split string by comma?
Split string by conditions?
miters?
s?
?
quote?
acters?
bol?

Thank you!
christoph.treude@adelaide.edu.au

creates challenges & opportunities for software engineering tools.