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We distinguish between

- static allocation: the maximum number of elements (capacity) is fixed when the collection is created
- dynamic allocation: the number of elements is unbounded and
 - list: duplicates are allowed and the elements are ordered
 - set: duplicates are disallowed and the elements are not ordered

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for each element of the collection

We distinguish two types of traversals:

- indexed traversals
- Iterator-based traversals

```
... collection = ...
for (int i = 0; i < collection.size(); i++) {
    ... element = collection.get(i);
    ...
}</pre>
```

```
... collection = ...
for (int i = 0; i < collection.size(); i++) {
    ... element = collection.get(i);
    ...
}</pre>
```

Print all investments (one per line) of a random portfolio.

Which methods are needed for indexed traversals?

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Which methods are needed for indexed traversals?

Answer

The methods size() and get(int).

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```
... collection = ...
...
Iterator<...> iterator = collection.iterator();
while (iterator.hasNext()) {
    ... element = iterator.next();
    ...
}
```

```
... collection = ...
...
Iterator<...> iterator = collection.iterator();
while (iterator.hasNext()) {
    ... element = iterator.next();
    ...
}
```

The above can be abbreviated using the advanced for loop:

```
... collection = ...
...
for (... element : collection) {
    ...
}
```

```
... collection = ...
for (... element : collection) {
    ...
}
```

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```
... collection = ...
for (... element : collection) {
    ...
}
```

Print all credit cards (one per line) of a random credit card centre.

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Which methods are needed for iterator-based traversals?

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Which methods are needed for iterator-based traversals?

Answer

The method iterator().

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Which methods are needed for iterator-based traversals?

Answer

The method iterator().

Question

Which collections support the advanced for loop?

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Which methods are needed for iterator-based traversals?

Answer

The method iterator().

Question

Which collections support the advanced for loop?

Answer

Those that implement Iterable (we come back to this in Chapter 10).

Write an app that prompts the user

Enter a stock symbol:

creates a random portfolio, checks whether this portfolio contains a stock with the symbol entered by the user, and prints The portfolio followed by either contains or does not contain followed by a stock with the symbol followed by the symbol entered by the user.

Write an app that takes a number of integers as command line arguments and prints the smallest.

Which of the two solutions is better?

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Which of the two solutions is better?

Answer

The app that uses indexed traversal.

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Which of the two solutions is better?

Answer

The app that uses indexed traversal.

Question Why?

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Which of the two solutions is better?

Answer

The app that uses indexed traversal.

Question Why?

Answer

It is more efficient (that is, it is faster).

How would you prove that?



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How would you prove that?

Answer

Time the apps.

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How would you prove that?

Answer

Time the apps.

Question

How often? Which inputs?

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Which Machine?



Research by undergraduate student Trevor Brown and graduate student Joanna Helga.

Friday March 7

Until this date you can drop the course without getting a grade for it and, hence, it will not affect your gpa.

Petitions to drop this course after the drop deadline will not be granted automatically.

Friday March 7, 14:30-16:00, instead of a lab there will be a lecture in Vari Hall, Lecture Hall D (second floor).