

632876

We say indexing is fast if it's done in  $O(1)$  time, searching is fast if done in  $O(\lg N)$  time, and inserting and deleting are fast if done in  $O(1)$  time. Compared to other data structures, unsorted arrays offer:

- a. slow indexing, slow search, slow insertions and deletions.
- b. fast indexing, fast search, slow insertions and deletions.
- \*c. fast indexing, slow search, slow insertions and deletions.
- d. slow indexing, slow search, fast insertions and deletions.
- e. slow indexing, fast search, fast insertions and deletions.
- f. "
- g. "
- h. "
- i. "
- j. "

General Feedback:

Unsorted arrays can be indexed in constant time (which is fast), searched in  $O(N)$  time (which is not as good as  $O(\lg N)$ ), and restructured in  $O(N)$  time (which is not as good as  $O(1)$  time).

634933

One of the things in Java that allows us to use polymorphism is that the declared type and actual type of a variable may be different.

In Java, the actual type of a parameter or variable's value can be any concrete class that is

- a. the same as the declared type, or any subclass of the declared type (if the declared type is a class)
- b. any class that implements the declared type (if the declared type is an interface)
- c. any subclass of a class that implements the declared type (if the declared type is an interface)
- \*d. A, B, and C above.
- e. A and B above, but not C
- f. "
- g. "
- h. "
- i. "
- j. "

General Feedback:

The rule of thumb is that the declared type is the same or more abstract than the actual type. If the declared type is a class, the things that are equally or less abstract are its descendants -- a subclass specializes a class. If declared type is an interface, it is an abstraction of any class that implements it, or by the relationship between classes and its descendants, any class that is a subclass of something that implements it.

Java wants a guarantee that the actual type will have the declared type's methods. That can be via inheritance or implementing an interface, or a combination of the two.

632218

An example of something that could be implemented using a Stack is:

- a. The undo operation in Word
- b. The back button in a web browser
- c. A postfix calculator
- \*d. All of the above
- e. Items (A) and (B) only
- f. "
- g. "
- h. "
- i. "
- j. "

General Feedback:

Anytime you're solving a problem where you're adding and removing data and you always need to remove the item that was added most recently is suited to a Stack. This is called a last-in-first-out property, or LIFO. Back buttons, the undo operation, and postfix calculators all have the last-in-first-out property.