

CSE115 / CSE503

Introduction to Computer Science I

Dr. Carl Alphonc
343 Davis Hall
alphonc@buffalo.edu

Office hours:

Tuesday 10:00 AM – 12:00 PM*

Wednesday 4:00 PM – 5:00 PM

Friday 11:00 AM – 12:00 PM

OR request appointment via e-mail

**Tuesday adjustments: 11:00 AM – 1:00 PM on 10/11, 11/1 and 12/6*

Last time

Collections (intro)

Today

Collections (continued)

Coding exercise

Coming up

Iterators

REVIEW

All collection classes in Java are subtypes of the `java.util.Collection<E>` interface.

‘<E>’ is new syntax

E is a *type variable*, and denote the element type of the collection:

`Collection<String>` denotes a collection of String objects

`Collection<ActionListener>` denotes a collection of ActionListener objects

Among the methods specified in the interface:

boolean add(E item) --- tries to add item to the collection; if this is successful, true is returned, false otherwise

boolean remove(Object item) --- tries to remove (one occurrence of) item from the collection; if this is successful, true is returned, false otherwise

boolean contains(Object item) --- returns true if item is in the collection, false otherwise

int size() --- return the number of items currently in the collection

Two specific collections (defined in java.util)

ArrayList<E>

- permits duplicates

- allows client to control order of elements

HashSet<E>

- does not permit duplicates

- does not allow client to control order of elements

To declare a variable of type HashSet of String:

```
HashSet<String> names;
```

To create a HashSet of String object, and assign its reference to the variable declared above:

```
names = new HashSet<String>();
```

MOVING ON

Live coding demo

PROGRAM:

```
ArrayList<String> words;
words = new ArrayList<String>();

words.add("cat");
words.add("dog");
words.add("rabbit");

for (String w : words) {
    System.out.println("A "+w+" is a good pet");
}
```

OUTPUT:

```
A cat is a good pet
A dog is a good pet
A rabbit is a good pet
```

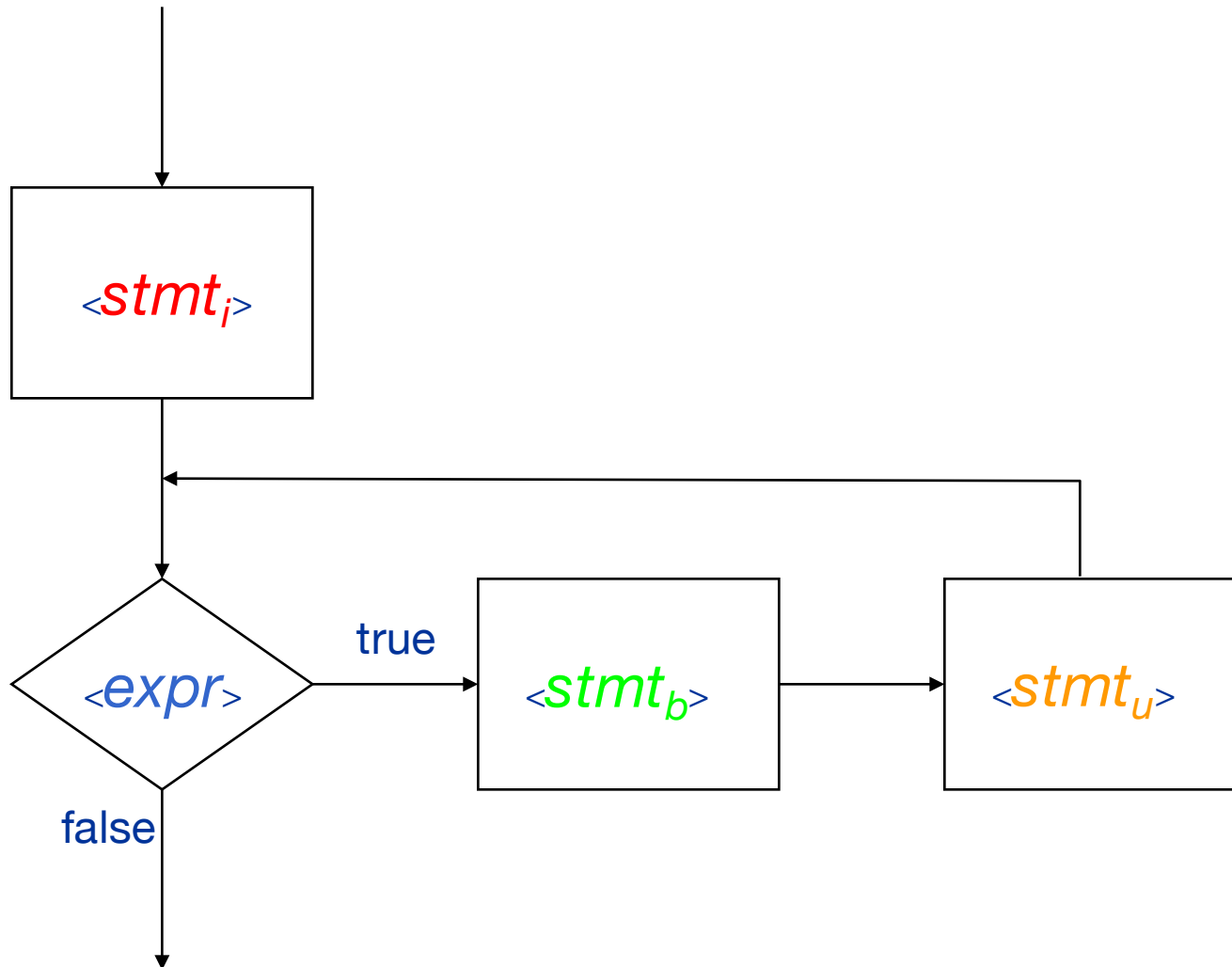
An ArrayList<E> object holds a sequence of E values.

The get(i) method returns the value stored at location i, as in:

`names.get(0) → "Fred"`

String

for ($\langle stmt_i \rangle$; $\langle expr \rangle$; $\langle stmt_u \rangle$) $\langle stmt_b \rangle$



for statement

PROGRAM:

```
ArrayList<String> words;  
words = new ArrayList<String>();  
  
words.add("cat");  
words.add("dog");  
words.add("rabbit");  
  
for (int i=0; i<words.size(); i=i+1) {  
    String w = words.get(i);  
    System.out.println("A "+w+" is a good pet");  
}
```

OUTPUT:

```
A cat is a good pet  
A dog is a good pet  
A rabbit is a good pet
```

A String object holds a sequence of char values.

The `length()` method returns the number of characters in the String.

`"dog".length() → 3`

`"rabbit".length() → 6`

PROGRAM:

```
ArrayList<String> words;
words = new ArrayList<String>();

words.add("cat");
words.add("dog");
words.add("rabbit");
for (int i=0; i<words.size(); i=i+1) {
    String w = words.get(i);
    System.out.println("The length of "+w+" is "
        +w.length());
}
```

OUTPUT:

```
The length of cat is 3
The length of dog is 3
The length of rabbit is 6
```

A String object holds a sequence of char values.

Each char value has a position (index) within the String. An index is an integer between 0 and the length() of the string, inclusive at 0, exclusive at length().

The charAt(int) method of String returns the char at the given index:

`"dog".charAt(0) → 'd'`

`"dog".charAt(2) → 'g'`


```
public void characterInString(String s) {

    System.out.println("The String " + s
        + " consists of these characters: ");

    for (int i=0; i<s.length(); i=i+1) {
        char ch = s.charAt(i);
        System.out.println("    '"+ch+"'");
    }
}
```

PROGRAM:

```
ArrayList<String> words;
words = new ArrayList<String>();

words.add("cat");
words.add("dog");
words.add("rabbit");
for (int i=0; i<words.size(); i=i+1) {
    String w = words.get(i);
    characterInString(w);
}
```

OUTPUT:

The String cat consists of these characters:

'c'

'a'

't'

The String dog consists of these characters:

'd'

'o'

'g'

The String rabbit consists of these characters:

'r'

'a'

'b'

'b'

'i'

't'

PAIR CODING EXERCISE
CHECK OUT Exercise-04 FROM REPO
TO GET TESTS

Define method named answer in quiz.Question.

Define this method so that it takes an `ArrayList<String>` as argument and returns true if the first String has length 5, false otherwise.

If the argument is null or if the `ArrayList` is empty, return false.

Submit to Exercise-04 in Web-CAT – enter the usernames of everyone in your group!

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SUBMIT NO LATER THAN
6:00 PM TOMORROW (SATURDAY)

HAVE A GREAT WEEKEND

MONDAY IS HALLOWEEN

WHO IS DRESSING UP
FOR CLASS?