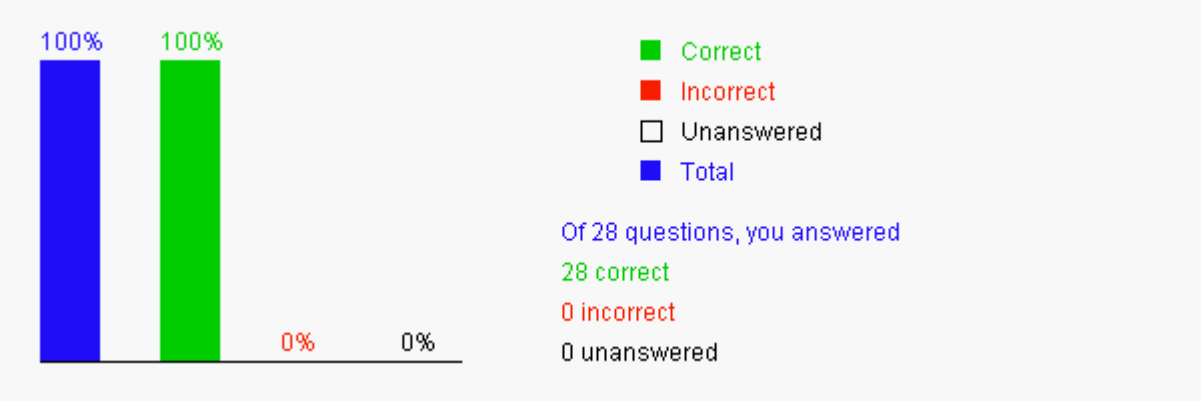
This quiz is for students to practice. A large number of additional quiz is available for instructors using Quiz Generator from the Instructor's Resource Website. Videos for Java, Python, and C++ can be found at https://yongdanielliang.github.io/revelvideos.html.

Chapter 19 Generics



Please send suggestions and errata to Dr. Liang at y.daniel.liang@gmail.com. Indicate which book and edition you are using. Thanks!

Section 19.2 Motivations and Benefits

19.1 Which of the following statements is correct?

- [x] A. Generics can help detect type errors at compile time, thus make programs more robust.
- [x] B. Generics can make programs easy to read.
- [x] C. Generics can avoid cumbersome castings.
- [ ] D. Generics can make programs run faster.

Your answer is correct

19.2 Fill in the code in Comparable_____ c = new Date();

- ( ) A. <String>
- ( ) B. <?>
- (•) C. <Date>
- ( ) D. <E>

Your answer is correct

19.3 Which of the following statements is correct?

- [x] A. Comparable<String> c = new String("abc");
- [x] B. Comparable<String> c = "abc";
- [ ] C. Comparable<String> c = new Date();
- [ ] D. Comparable<Object> c = new Date();

Your answer is correct

19.4 Suppose List list = new ArrayList(). Which of the following operations are correct?

- [x] A. list.add("Red");
- [x] B. list.add(new Integer(100));
- [x] C. list.add(new java.util.Date());
- [x] D. list.add(new ArrayList());

Your answer is correct

19.5 Suppose List<String> list = new ArrayList<String>. Which of the following operations are correct?

- (•) A. list.add("Red");
- ( ) B. list.add(new Integer(100));
- ( ) C. list.add(new java.util.Date());
- ( ) D. list.add(new ArrayList());

Your answer is correct

19.6 Suppose ArrayList<Double>list = new ArrayList<>(). Which of the following statements are correct?

- [x] A. list.add(5.5); // 5.5 is automatically converted to new Double(5.5)

- [x] B. list.add(3.0); // 3.0 is automatically converted to new Double(3.0)
- [x] C. Double doubleObject = list.get(0); // No casting is needed
- [x] D. double d = list.get(1); // Automatically converted to double

Your answer is correct

Section 19.3 Declaring Generic Classes and Interfaces

19.7 To declare a class named A with a generic type, use

- (•) A. public class A<E> { ... }
- ( ) B. public class A<E, F> { ... }
- ( ) C. public class A(E) { ... }
- ( ) D. public class A(E, F) { ... }

Your answer is correct

19.8 To declare a class named A with two generic types, use

- ( ) A. public class A<E> { ... }
- (•) B. public class A<E, F> { ... }
- ( ) C. public class A(E) { ... }
- ( ) D. public class A(E, F) { ... }

Your answer is correct

19.9 To declare an interface named A with a generic type, use

- (•) A. public interface A<E> { ... }
- ( ) B. public interface A<E, F> { ... }
- ( ) C. public interface A(E) { ... }
- ( ) D. public interface A(E, F) { ... }

Your answer is correct

19.10 To declare an interface named A with two generic types, use

- ( ) A. public interface A<E> { ... }
- (•) B. public interface A<E, F> { ... }
- ( ) C. public interface A(E) { ... }
- ( ) D. public interface A(E, F) { ... }

Your answer is correct

19.11 To create a list to store integers, use

- ( ) A. ArrayList<Object> list = new ArrayList<>();
- (•) B. ArrayList<Integer> list = new ArrayList<>();
- ( ) C. ArrayList<int> list = new ArrayList<int>();
- ( ) D. ArrayList<Number> list = new ArrayList<>();

Your answer is correct

Section 19.4 Generic Methods

19.12 The method header is left blank in the following code. Fill in the header.

```
public class GenericMethodDemo {
  public static void main(String[] args ) {
    Integer[] integers = {1, 2, 3, 4, 5};
    String[] strings = {"London", "Paris", "New York", "Austin"};

    print(integers);
    print(strings);
  }

  _____________________________________ {
    for (int i = 0; i < list.length; i++)
      System.out.print(list[i] + " ");
    System.out.println();
  }
}
```

- [ ] A. public static void print(Integer[] list)
- [ ] B. public static void print(String[] list)
- [ ] C. public static void print(int[] list)

- [x] D. public static void print(Object[] list)
- [x] E. public static <E> void print(E[] list)

Your answer is correct 

19.13 To create a generic type bounded by Number, use

- (•) A. <E extends Number>
- ( ) B. <E extends Object>
- ( ) C. <E>
- ( ) D. <E extends Integer>

Your answer is correct 

Section 19.6 Raw Type and Backward Compatibility

19.14 Which of the following declarations use raw type?

- ( ) A. ArrayList<Object> list = new ArrayList<>();
- ( ) B. ArrayList<String> list = new ArrayList<>();
- ( ) C. ArrayList<Integer> list = new ArrayList<>();
- (•) D. ArrayList list = new ArrayList();

Your answer is correct 

19.15 If you use the javac command to compile a program that contains raw type, what would the compiler do?

- ( ) A. report syntax error
- ( ) B. report warning and generate a class file
- ( ) C. report warning without generating a class file
- ( ) D. no error and generate a class file
- (•) E. report warning and generate a class file if no other errors in the program.

Your answer is correct 
Explanation: For javac, a class file is generated even if the program has compile warnings.

19.16 If you use the javac ?Xlint:unchecked command to compile a program that contains raw type, what would the compiler do?

- ( ) A. report compile error
- (•) B. report warning and generate a class file
- ( ) C. report warning without generating a class file
- ( ) D. no error and generate a class file

Your answer is correct 

Section 19.7 Wildcards

19.17 Is ArrayList<Integer> a subclass of ArrayList<Object>?

- ( ) A. Yes
- (•) B. No

Your answer is correct 

19.18 Is ArrayList<Integer> a subclass of ArrayList<?>?

- (•) A. Yes
- ( ) B. No

Your answer is correct 

19.19 Is ArrayList<Integer> a subclass of ArrayList<? extends Number>?

- (•) A. Yes
- ( ) B. No

Your answer is correct 

19.20 Is ArrayList<Number> a subclass of ArrayList<? extends Number>?

- (•) A. Yes
- ( ) B. No

Your answer is correct

19.21 Is ArrayList<?> same as ArrayList<? extends Object>?

- (●) A. Yes
- ( ) B. No

Your answer is correct

19.22 Does <? super Number> represent a superclass of Number?

- (●) A. Yes
- ( ) B. No

Your answer is correct

19.23 Which of the following can be used to replace YYYYYYYY in the following code?

```
public class WildCardDemo3 {
  public static void main(String[] args) {
    GenericStack<String> stack1 = new GenericStack<>();
    GenericStack<Object> stack2 = new GenericStack<>();
    stack2.push("Java");
    stack2.push(2);
    stack1.push("Sun");
    add(stack1, stack2);
    WildCardDemo2.print(stack2);
  }

  public static <T> void add(GenericStack<T> stack1,
      GenericStack<YYYYYYYY> stack2) {
    while (!stack1.isEmpty())
      stack2.push(stack1.pop());
  }
}
```

- ( ) A. ? super Object
- (●) B. ? super T
- ( ) C. ? extends T
- ( ) D. ? extends Object

Your answer is correct

19.24 Which of the following can be used to replace YYYYYYYY in the following code?

```
public class WildCardDemo3 {
  public static void main(String[] args) {
    GenericStack<String> stack1 = new GenericStack<>();
    GenericStack<Object> stack2 = new GenericStack<>();
    stack2.push("Java");
    stack2.push(2);
    stack1.push("Sun");
    add(stack1, stack2);
    WildCardDemo2.print(stack2);
  }

  public static <T> void YYYYYYYY {
    while (!stack1.isEmpty())
      stack2.push(stack1.pop());
  }
}
```

- [ ] A. add(GenericStack<T> stack1, GenericStack<T> stack2)
- [x] B. add(GenericStack<? extends T> stack1, GenericStack<T> stack2)
- [x] C. add(GenericStack<T> stack1, GenericStack<? super T> stack2)
- [x] D. add(GenericStack<T> stack1, GenericStack<Object> stack2)

Your answer is correct

Section 19.8 Erasure and Restrictions on Generics

19.25 ArrayList<String> and ArrayList<Integer> are two types. Does the JVM load two classes ArrayList<String> and ArrayList<Integer>?

- ( ) A. Yes
- (●) B. No

Your answer is correct
Explanation: The JVM loads just one ArrayList.

19.26 Which of the following statements are true?

- [x] A. Generic type information is present at compile time.
- [x] B. Generic type information is not present at runtime.
- [x] C. You cannot create an instance using a generic class type parameter.
- [x] D. You cannot create an array using a generic class type parameter.
- [x] E. You cannot create an array using a generic class.

Your answer is correct 

19.27 If E is a generic type for a class, can E be referenced from a static method?

- ( ) A. Yes
- (•) B. No

Your answer is correct 
Explanation: It is illegal to refer to a generic type parameter for a class in a static method or initializer, because generic type for a class belongs to a specific instantiation of the class.

19.28 Fill in the most appropriate code in the blanks in the MyInt class?

```
public class MyInt implements _______ {
  int id;

  public MyInt(int id) {
    this.id = id;
  }

  public String toString() {
    return String.valueOf(id);
  }

  public int compareTo(_______ arg0) {
    if (id > arg0.id)
      return 1;
    else if (id < arg0.id)
      return -1;
    else
      return 0;
  }
}
```

- ( ) A. Comparable / Object
- (•) B. Comparable<MyInt> / MyInt
- ( ) C. Comparable<MyInt> / Object
- ( ) D. Comparable / MyInt

Your answer is correct