Quiz

Note: It is recommended that you save your response as you complete each question.

Question 1 (1 point)

A stack is useful to reverse the order of a set of data.

- True
- False

Save

Question 2 (1 point)

If the top of the stack were stored at position 0 of the array in our array implementation of a stack, then the time complexity of many of the operations would be O(n) instead of O(1).

- True
- False

Save

Question 3 (1 point)

It is critically important for software engineers to listen to their clients and stakeholders in order to make sure that they are solving the right problem.

- True
- False

Save

Question 4 (1 point)

The most important quality characteristic (e.g. reliability, robustness, efficiency, maintainability) for a given system depends upon the specifics of the problem being solved.

- True
- False

Save

Question 5 (1 point)

UML class diagrams provide information about the classes in a given system including class names, attributes, method signatures, and relationships between classes.

- True
- False

Save

Question 6 (1 point)

Had we used sentinel nodes in our linked implementation of a stack, it would created additional special cases involving the first or the last elements in the linked list. These special cases would have resulted in additional code.

- True
- False

Save

Question 7 (1 point)

When loops are nested, the Order of the outer loop is multiplied by the Order of the inner loop to get the total Order.

- True
- False

Save

Question 8 (1 point)

The following growth function has time complexity O(___).

$6n^3 + 3n^2\log n + 15n + 25$

- n^3
- $n^2\log n$
- n
- none of the above

Save

Question 9 (1 point)

The following growth function has time complexity O(___).

$15n^2 + 43n^3 + 4n^3\log n + 22$

- n^2
- $n^3\log n$
- n^3
- none of the above

Save

Question 10 (1 point)

The following code segment has time complexity O(___).

```
for (int i=0; i < n; i++)
   for (int j=0; j < n; j++)
      System.out.println(i + " " + j);
```

- n^2
- n
- $n\log n$
- none of the above

Save

Question 11 (1 point)

The following code segment has time complexity O(___).

```
int sum = 0;
for (int i=1; i < n; i*2)
  for (int j=0; j < n; j++)
    sum = sum + j;
```

- n^2
- n
- nlogn
- none of the above

Save

Question 12 (1 point)

The following code segment has time complexity O(___).

```
int sum = 0;
for (int i=0; i < n; i++)
  for (int j=0; j < i; j++)
    sum = sum + j;
```

- n^2
- n
- nlogn
- none of the above

Save

Question 13 (1 point)

The following code segment has time complexity O(___).

```
for (int i=0; i < n; i++)
  for (int j=0; j < 10000; j++)
    System.out.println(i + " " + j);
```

- n^2
- n
- nlogn
- none of the above

Save

Question 14 (1 point)

Given a linked list of LinearNode objects as we discussed in class with a reference called front pointing to the first node, finding a target element in the list or determining that it is not in the list will have time complexity O(___).

- n^2
- n
- nlogn
- none of the above

Save

Question 15 (1 point)

The toString() operation for both the array and linked implementations of a stack is O(_____).

- n^2
- n
- 1
- none of the above

Save

Question 16 (1 point)

Stacks are useful data structures for _____ the order of something.

- reversing
- preserving
- both 1 & 2
- none of the above

Save

Question 17 (1 point)

The three basic operations on a Stack are _____.

- add, remove, look
- enqueue, dequeue, front
- push, pop, peek
- none of the above

Save

Question 18 (1 point)

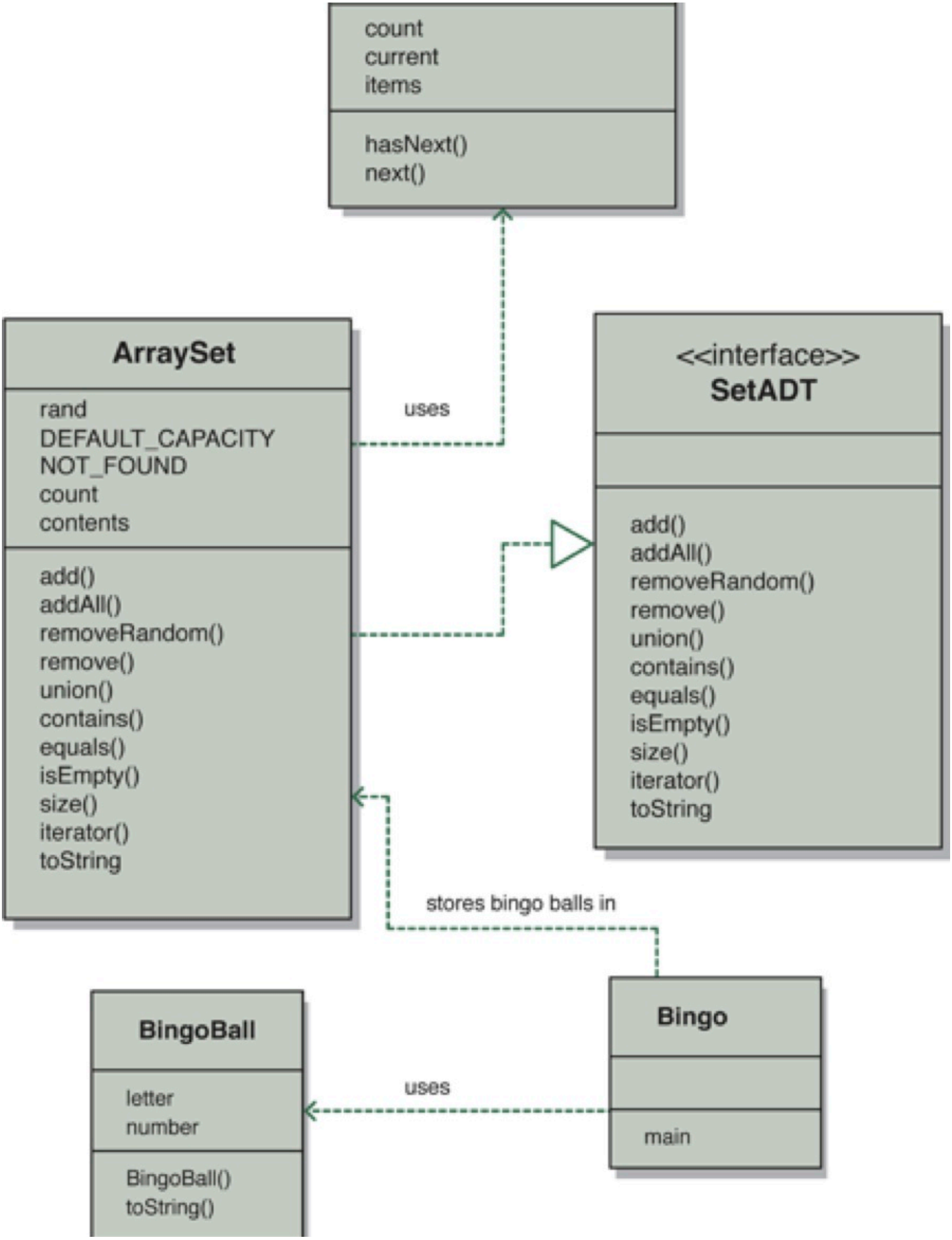

count
current
items
hasNext()
next()
ArraySet
rand
DEFAULT_CAPACITY
NOT_FOUND
count
contents
add()
addAll()
removeRandom()
remove()
union()
contains()
equals()
isEmpty()
size()
iterator()
toString
uses
<<interface>>
SetADT
add()
addAll()
removeRandom()
remove()
union()
contains()
equals()
isEmpty()
size()
iterator()
toString
stores bingo balls in
BingoBall
letter
number
BingoBall()
toString()
uses
Bingo
main

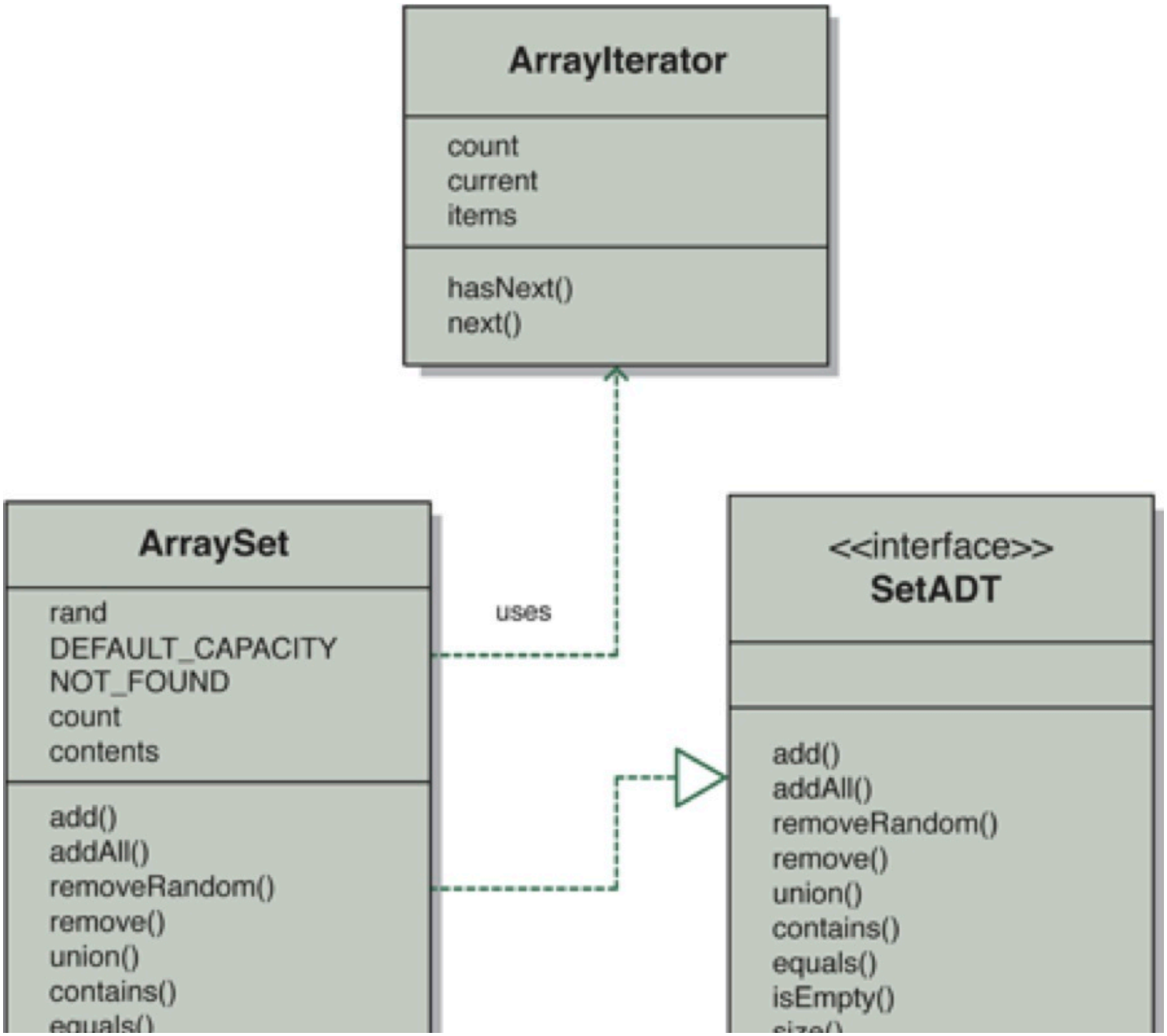
FIGURE 3.10 UML description of the bingo system

In the diagram above the items add() and addAll() in the ArraySet object are _____.

- methods
- attributes
- interfaces
- none of the above

Save

Question 19 (1 point)



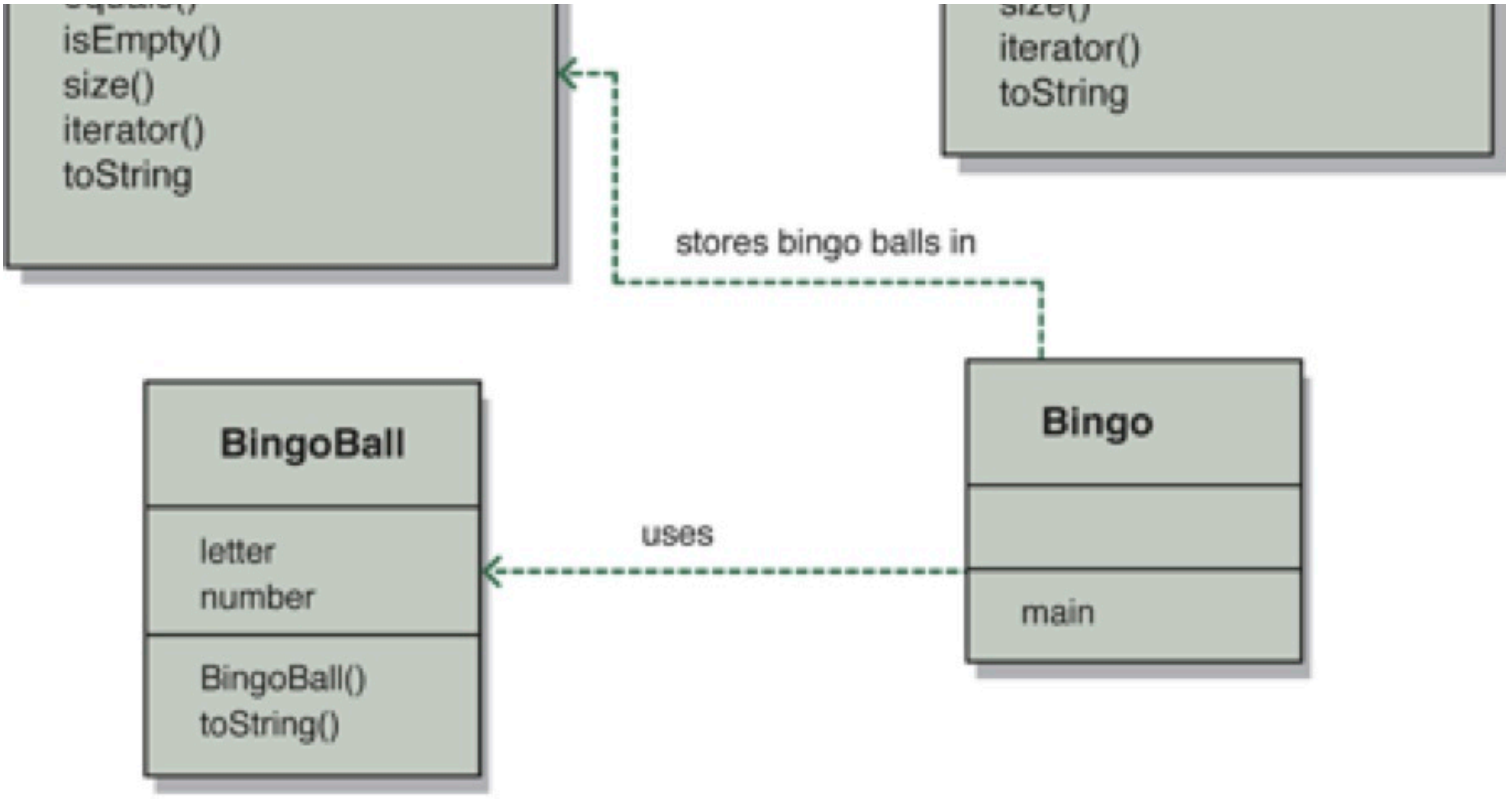


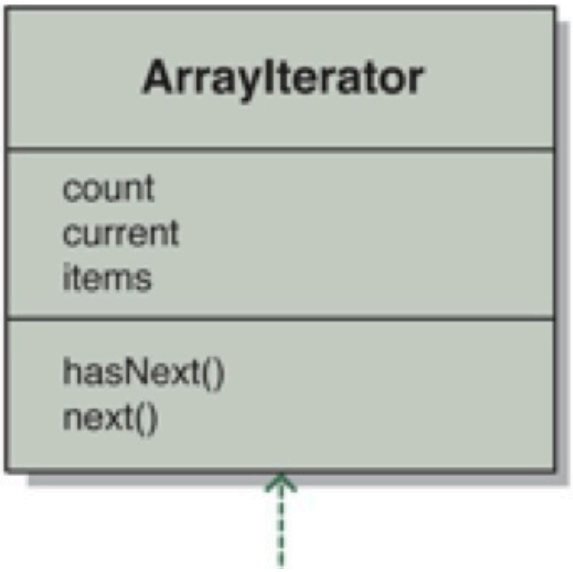
FIGURE 3.10 UML description of the bingo system

In the diagram above the items letter and number in the BingoBall object are _____.

- methods
- attributes
- interfaces
- none of the above

Save

Question 20 (1 point)



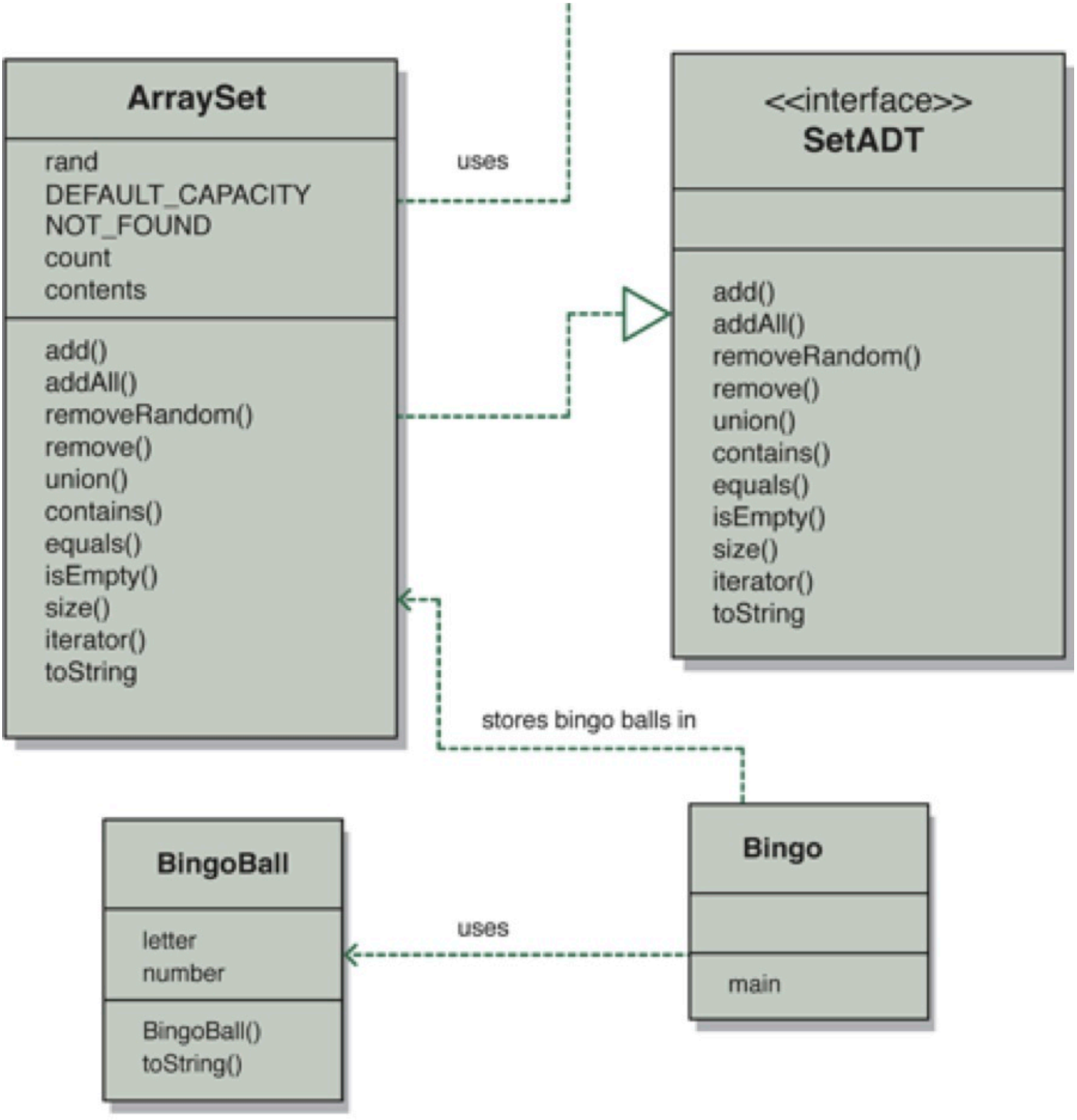


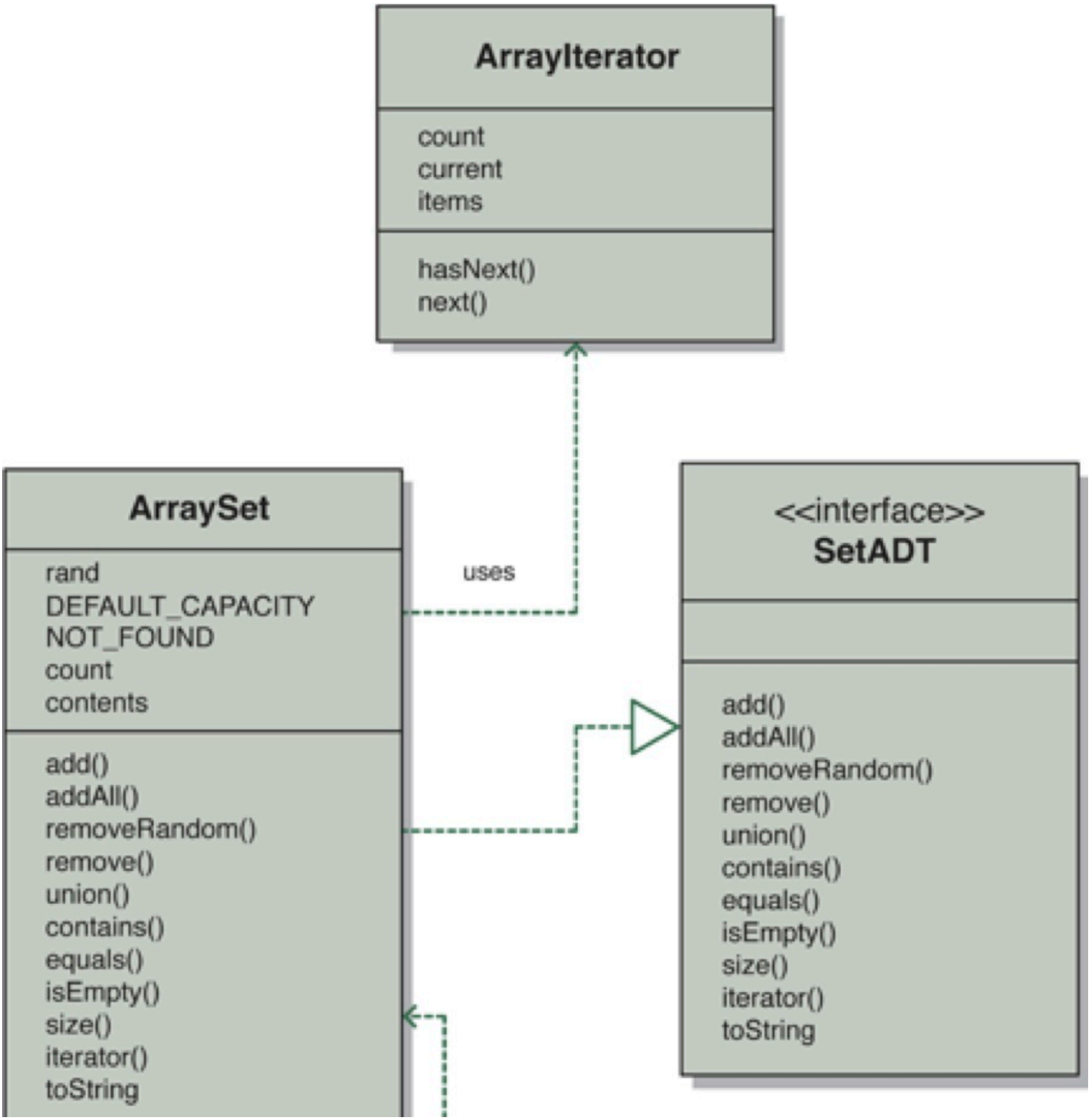
FIGURE 3.10 UML description of the bingo system

In the image above, the relationship between ArraySet and SetADT is

- inheritance
- implementation
- uses
- none of the above

Save

Question 21 (1 point)



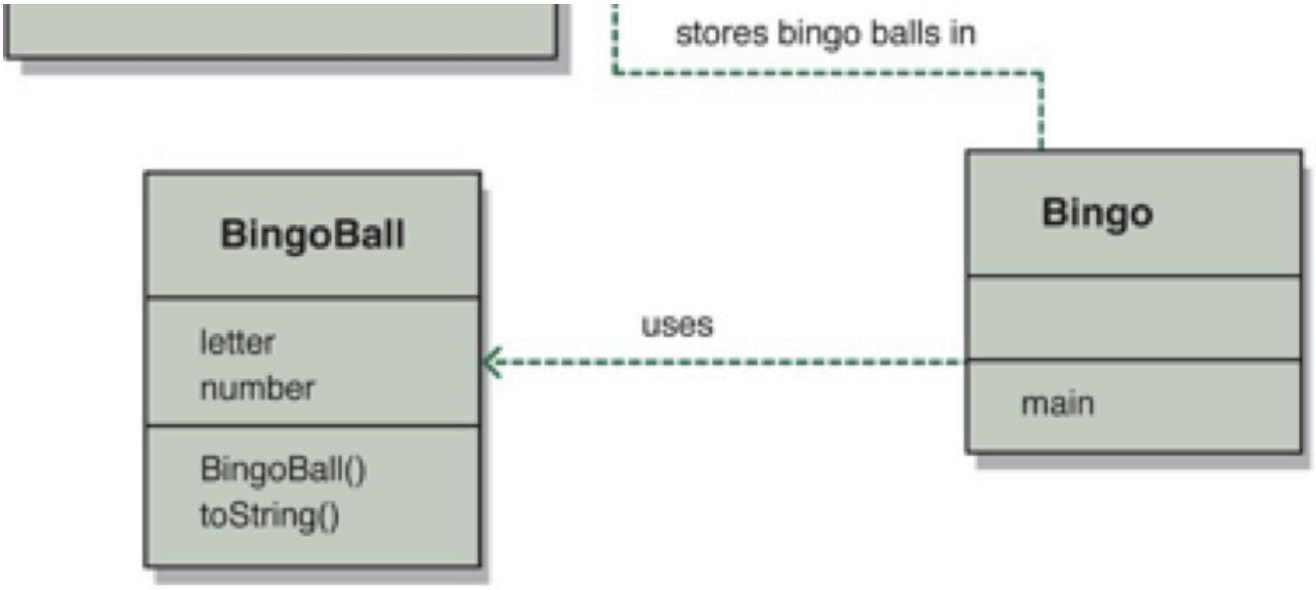


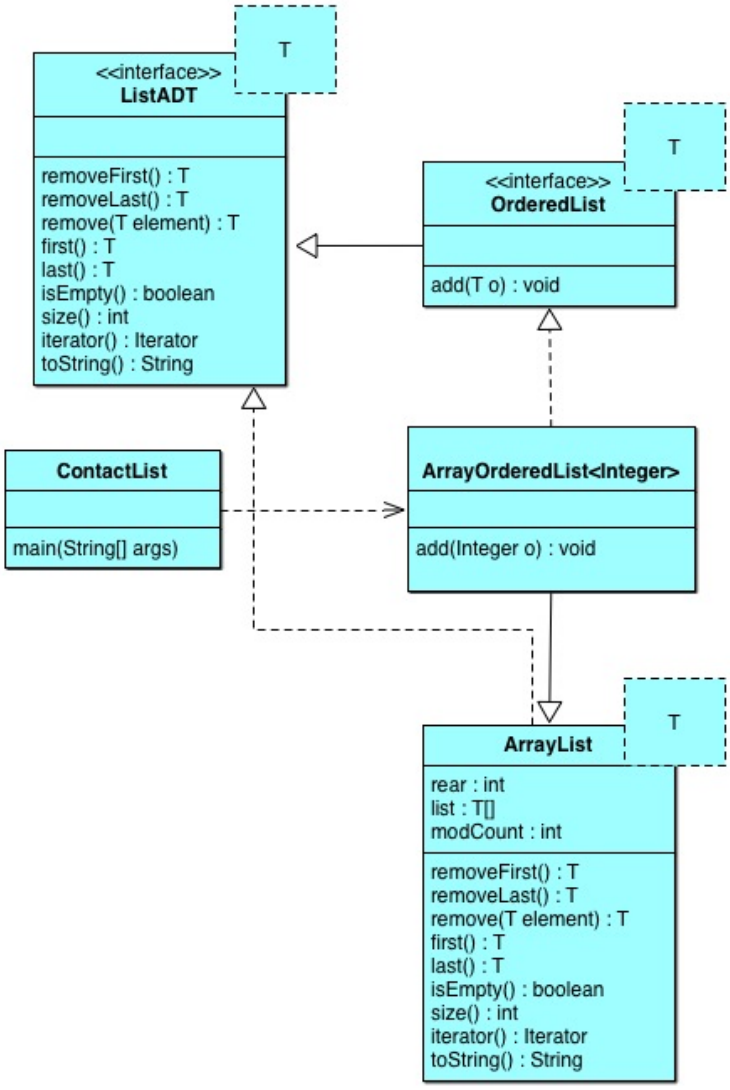
FIGURE 3.10 UML description of the bingo system

In the image above the relationship between Bingo and BingoBall is

- inheritance
- implementation
- uses
- none of the above

Save

Question 22 (1 point)

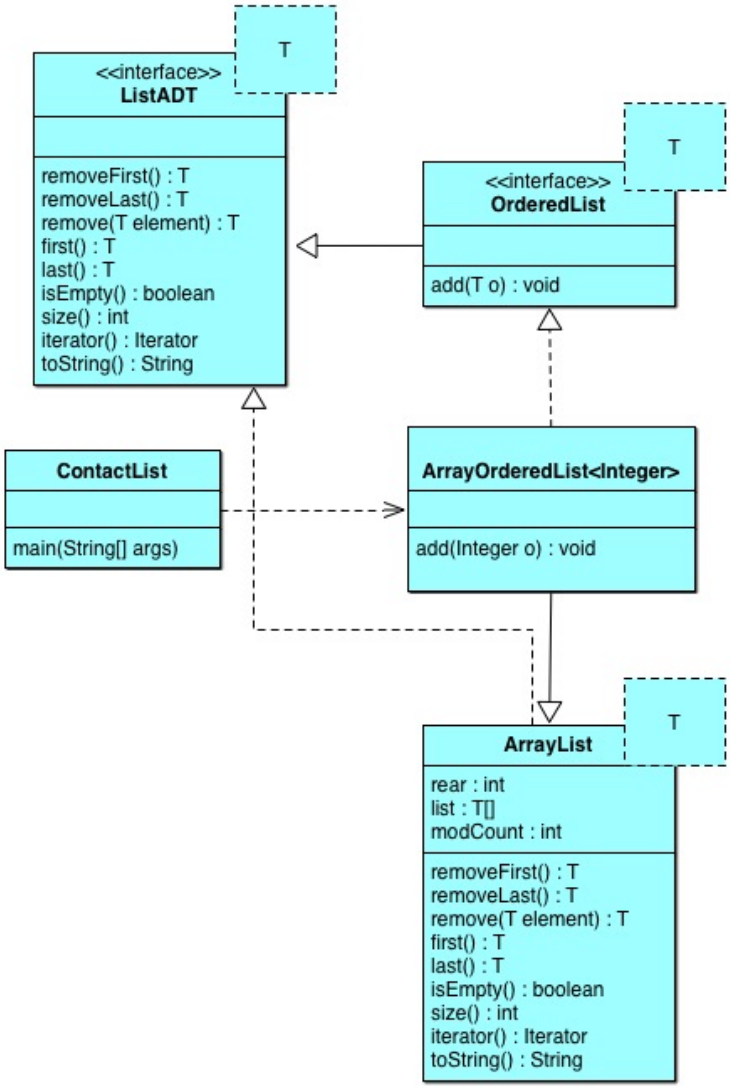


In the image above, the relationship between ArrayList and ListADT requires that ArrayList _____ all of the methods of ListADT.

- use
- inherit
- implement
- none of the above

Save

Question 23 (1 point)



In the image above, the relationship between ContactList and ArrayOrderedList means that ContactList inherits all of the attributes and methods of ArrayOrderedList.

- True
- False

Save

Question 24 (1 point)

The _____ relationship is indicative of one class being derived from or being a child of the other class.

- inheritance
- uses
- implements
- none of the above

Save

Question 25 (1 point)

The degree to which software adheres to its specific requirements is called

- reliability
- robustness
- correctness
- none of the above

Save

Question 26 (1 point)

A _____ is an object that gathers and organizes other objects. Examples include Stacks, Queues, Lists, etc.

- variable
- collection
- data type
- none of the above

Save

Question 27 (1 point)

Given a class called Ball, the following code:

Ball x = new Ball();

could be said to create a variable of type Ball and then _____ an object of type Ball and assign the variable x to refer to it.

- abstracts
- implements
- instantiates
- none of the above

Save

Question 28 (1 point)

Maintainability refers to _____.

- the degree to which software adheres to its specific requirements.
- the frequency and criticality of software failure.
- The degree to which erroneous situations are handled gracefully.
- The ease with which changes can be made to the software.

Save

Question 29 (1 point)

One purpose of inheritance is to _____ existing software.

- reuse
- alter
- protect
- none of the above

Save

Question 30 (1 point)

In our linked implementation of a stack, the pop operation is implemented by first checking to make sure there is an element on the stack. If there is an element on the stack then the operation continues by returning a reference to the element currently stored at the top of the stack and adjusting the top reference to the new top of the stack. Otherwise, an exception is thrown.

- True
- False

Save

Question 31 (1 point)

We could turn our array implentation of a stack around storing the top of the stack at position 0 of the array and still have all of the operations be O(1).

- True
- False

Save

Question 32 (1 point)

A static instance variable is shared among all instances of a class. Thus if a class Course has an attribute grade that is static:

static String grade;

That would mean that changing that grade would change it for all instances of Course.

- True
- False

Save

Question 33 (1 point)

Public variables violate encapsulation.

- True
- False

Save

Question 34 (1 point)

Two methods with the same name and the same return type but different parameter lists is an example of method overloading. For example:

public void moveBall();

public void moveBall(int x);

would be an example of method overloading.

- True
- False

Save

Question 35 (1 point)

A linked structure uses integer indices to link one object to another.

- True
- False

Save

Question 36 (1 point)

A constructor must NOT have an explicit return type.

- True
- False

Save

Question 37 (1 point)

The order of an algorithm is found by eliminating constants and all but the dominant term in the algorithm's growth function.

- True
- False

Save

Question 38 (1 point)

The order in which references are changed is crucial to maintaining a linked list. Changes made in the wrong order could lead to the loss of access to all or part of the list.

- True
- False

Save

Question 39 (1 point)

To adhere to the principle of encapsulation, the instances variables of an object must only be modified by methods of that object.

- True
- False

Save

Question 40 (1 point)

An array has no set capacity limitations other than the size of the computers memory where as the size of a linked list is determined when it is created and cannot be changed.

- True
- False

Save

Question 41 (1 point)

The concept of aggregation, as described in UML, is the situation in which one class is essentially made up, at least in part, of other classes.

- True
- False

Save

Question 42 (1 point)

The concept of implementation is when one class contains an attribute of the type of another class. Thus if class A implements class B then A contains an attribute of type B.

- True
- False

Save

Question 43 (1 point)

What is the principle difference in behavior between a stack and a queue?

- a stack reverses order whereas a queue preserves order
- a stack does nothing whereas a queue can preserve and reverse order
- there is no difference
- a stack preserves order whereas a queue reverses order

Save

Question 44 (1 point)

Method overriding occurs when . . .

- a child class has a method with the same signature as a method of its parent
- two methods have the same name and parameter list but different return types
- two methods within the same context have the same name but different parameter lists
- none of the above

Save

Question 45 (1 point)

UML class diagrams may include which of the following?

- The classes used in the system
- The static relationships among classes
- The attributes and operations of each class
- The constraints on the connections among objects
- all of the above

Save

Question 46 (1 point)

Stacks operate as _____.

- Last Out, First Out (LOFO)
- First In, First Out (FIFO)
- Last In, First Out
- None of the above

Save

Question 47 (1 point)

The relationship in which all of the public and protected variables and methods of a given class are passed on to a child class is _____. This relationship is created in the class header by the use of the word extends:

public class A extends B . . .

- aggregation
- inheritance
- implements
- uses

Save

Question 48 (1 point)

Which of the following is NOT an aspect of software quality

- Correctness
- Credibility
- Usability
- Robustness

Save

Question 49 (1 point)

Which of the following has the **smallest** time complexity?

- $3n+5+2^n$
- logn + 6logn + 2
- 3n+4
- nlogn

Save

Question 50 (1 point)

An equation that shows the time or space utilization of a given algorithm relative to the problem size is called a _____.

- asymptotic complexity
- algorithm
- growth function
- none of the above

Save

Question 51 (1 point)

What does the peek operation on a Stack return?

- a reference to the LinearNode object on top of the stack
- a reference to the element stored at the top of the stack.
- the front pointer for the linked list
- none of the above

Save

Question 52 (1 point)

The concept of _____ refers to the ability of users to learn and use a given system.

- Reliability
- Usability
- Efficiency
- Robustness

Save

Question 53 (1 point)

To add an element to a stack you use the _____method.

- add
- enqueue
- push
- pop

Save

Question 54 (1 point)

Which of the following is the correct way to instantiate an array of 10 generic objects?

- T[] x = new T[10];
- T[10] x = new T[];
- T[] x = (T[])(new object[10]);
- none of the above

Save

Question 55 (1 point)

In java, generics are used as type placeholders. This allows us to create a collection using a type such as T and then replace that generic type T with another type at the time we instantiate the collection. This works because of Java's ability to perform _____ – meaning that the association between the variables and their types is done at run-time instead of compile-time.

- dynamic or late binding
- compilation
- graphical user interfaces
- inheritance and implementation

Save

Question 56 (1 point)

One of the most common methods to override in the creation of classes in java is the equals method inherited from java.lang.Object. If you do not override this method, what definition of equality is used?

- Objects are equal if they have equal value
- Objects are equal if they are the same object (i.e. two references pointing to the same address in memory).
- Objects are equal if they are of the same class.
- none of the above

Save

Question 57 (1 point)

The following code:

Integer x;

Instantiates a new Integer and sets the reference variable x to point to it.

- True
- False

Save

Question 58 (1 point)

The following code segment is O(n)

```
int sum = 0;
for (int i = 0; i < n; i++)
{
```

```
sum = sum + i;
}
```

- True
- False

Save

Question 59 (1 point)

The following loop is O(log n)

```
int sum = 0;
for (int i = 1; i < 1000; i * 2)
{
sum = sum + i;
}
```

- True
- False

Save

Question 60 (1 point)

Which of the following has the **largest** time complexity?

- $3n+5+2^n$
- logn + 6logn + 2
- 3n+4
- nlogn

Save

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