Quiz

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

Question 1 (1 point)

If a collection is Iterable (implements the Iterable interface) then it must provide a(n) _____ method that returns a(n) _____ object. That object will have two useful methods, _____ and _____.

- iterator, Iterator, next() and hasNext()
- Iterator, iterator, next() and remove()
- compareTo, iterator, next() and remove()
- none of the above

Save

Question 2 (5 points)

A person must be liable in order to be blameworthy.

- True
- False

Save

Question 3 (5 points)

A person can be said to be role responsible for something simply because of the position they occupy.

- True
- False

Save

Question 4 (5 points)

A person who did something or failed to do something that led to a particular event can be said to be _____.

- role responsible
- causally responsible
- blameworthy
- liable

Save

Question 5 (5 points)

A person who did something wrong or failed to do something right that led to a particular event can be said to be _____.

- role responsible
- causally responsible
- blameworthy
- liable

Save

Question 6 (5 points)

A person who is responsible for something simply because of the position they occupy is said to be _____.

- role responsible
- causally responsible
- blameworthy
- liable

Save

Question 7 (5 points)

A person who is financially responsible for something is said to be _____.

- role responsible
- causally responsible
- blameworthy
- liable

Save

Question 8 (5 points)

The fair use exception to copyright means that you can copy anything you want for educational purposes.

- True
- False

Save

Question 9 (5 points)

All creative works are covered by copyright from the moment they are registered with the patent office.

- True
- False

Save

Question 10 (5 points)

All creative works are covered by copyright from the moment they are _____.

- created
- registered with the patent office
- registered with the copyright office
- none of the above

Save

Question 11 (5 points)

Which of the following is a valid copyright exception under the fair use doctrine?

- parody
- citation
- partial copy for educational use
- all of the above

Save

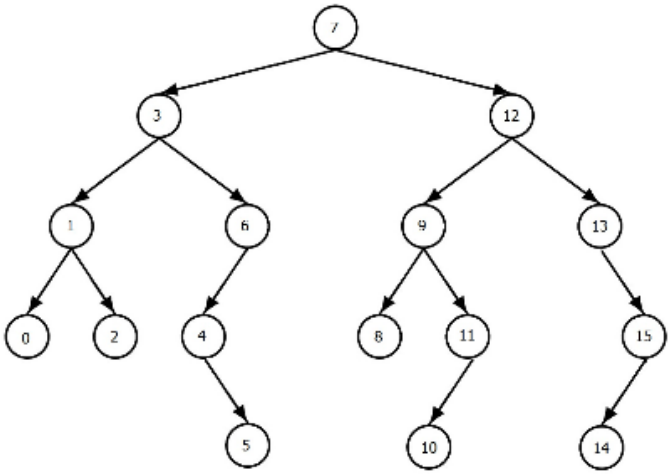
Question 12 (5 points)

Which of the following is a good way to legally capture the creation date of something for copyright purposes.

- tell a friend
- e-mail it to yourself
- mail it to yourself and do not open the envelope
- all of the above

Save

Question 13 (5 points)

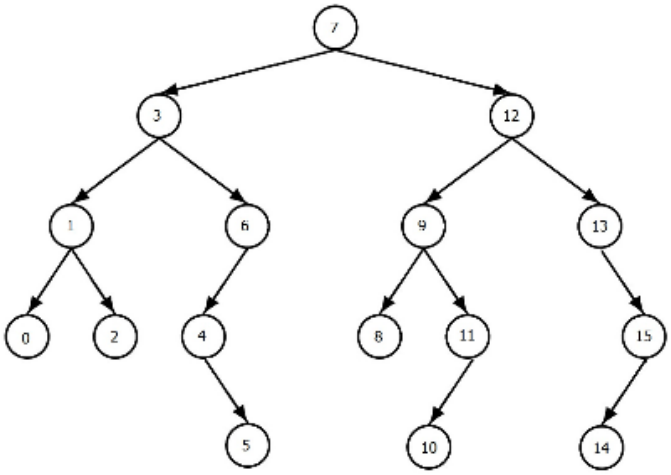


Given the image of the binary tree, what is the height of this tree?

- 2
- 3
- 4
- 5

Save

Question 14 (5 points)

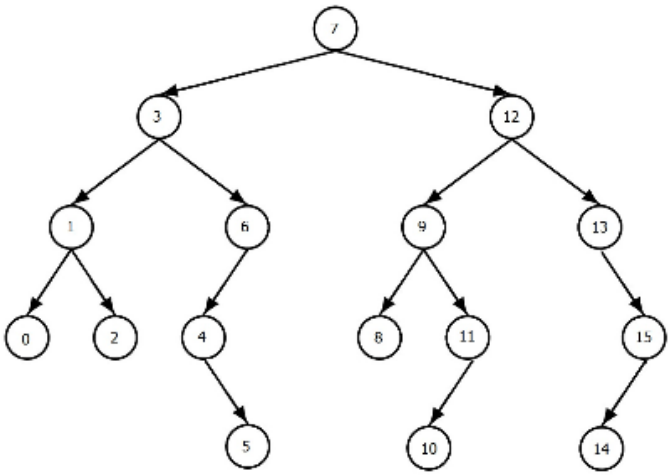


Given the image of the binary tree, how many nodes are in this tree?

- 8
- 12
- 14
- 16

Save

Question 15 (5 points)

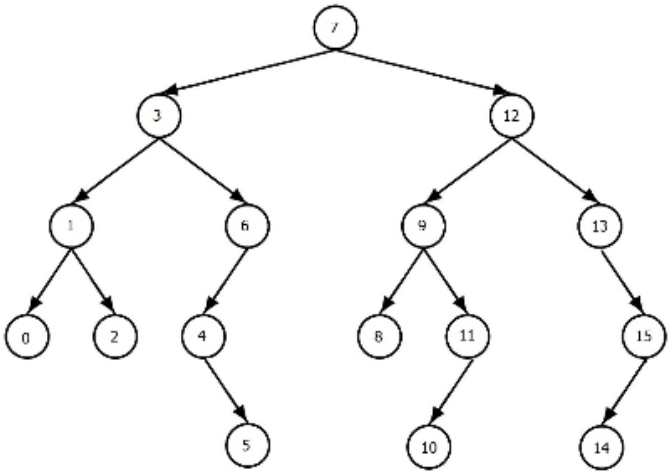


Given the image of the binary tree, how many leaves are in this tree?

- 3
- 4
- 5
- 6

Save

Question 16 (5 points)

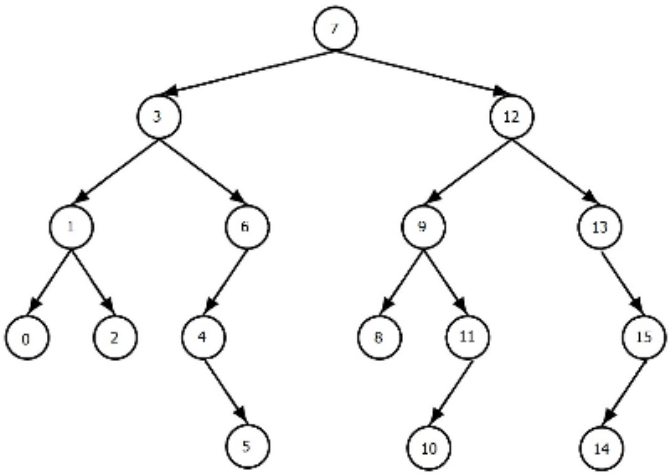


Given the image of the binary tree, what element is at the root of this tree?

- 7
- 4
- 5
- 9

Save

Question 17 (5 points)

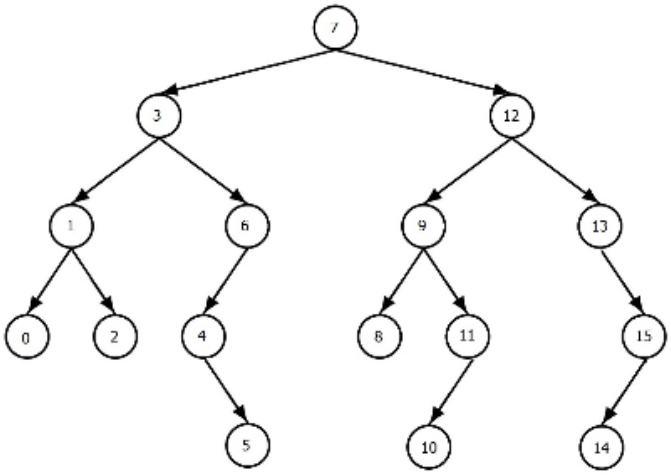


Using our definition that all of the leaves must be at level h or h-1, is this tree balanced?

- yes, it is balanced
- no, it is not balanced

Save

Question 18 (5 points)



Is this tree complete?

- yes, it is complete
- no, it is not complete

Save

Question 19 (5 points)

Using the array-based computational strategy for implementing a binary tree, the left child of a node stored at position n will be stored at position _____.

- 2n
- 2n + 1
- 2(n+1)
- none of the above

Save

Question 20 (5 points)

If a tree that is not complete is stored using the computational strategy, then the array will contain _____.

- gaps (i.e. empty positions that waste space)
- duplicate elements that waste space
- all of the data and nothing more
- none of the above

Save

Question 21 (5 points)

Using the array-based simulated link strategy to store a binary tree, each position of the array will contain an object with three attributes. These attributes will be:

- a reference to the element stored there as well as references/links to the left child and the right child of the node
- a reference to the element stored there as well as the array index of the left child and the array index of the right child of the node
- only the element stored there
- none of the above

Save

Question 22 (5 points)

Using the linked strategy to store a binary tree, each node will be represented by a tree node object containing:

- a reference to the element stored there as well as references/links to the left child and the right child of the node
- a reference to the element stored there as well as the array index of the left child and the array index of the right child of the node
- only the element stored there
- none of the above

Save

Question 23 (5 points)

A binary search tree is a binary tree with the added property that _____.

- the left child is less than the root/node which is less than or equal to the right child
- the left child is less than or equal to the root/node which is less than the right child
- the left child is less than the root/node which is less than the right child
- none of the above

Save

Question 24 (5 points)

The recursive algorithm for an inorder traversal of a binary tree is:

Traverse(left);
visit(node);
Traverse(right);

visit(node);
Traverse(right);
Traverse(left);

visit(node);
Traverse(left);
Traverse(right);

Traverse(left);
Traverse(right);
visit(node);

Save

Question 25 (5 points)

The recursive algorithm for an post-order traversal of a binary tree is:

Traverse(left);
visit(node);
Traverse(right);

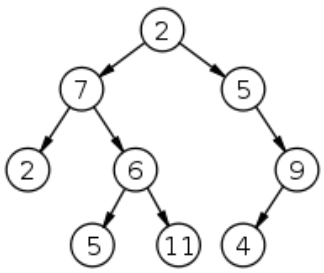
visit(node);
Traverse(right);
Traverse(left);

visit(node);
Traverse(left);
Traverse(right);

Traverse(left);
Traverse(right);
visit(node);

Save

Question 26 (5 points)

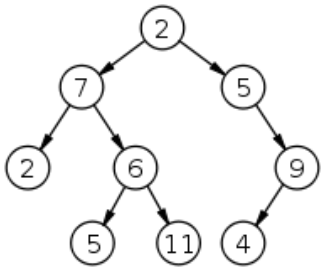


Given the binary tree, an inorder traversal would yield _____.

- 2 7 5 2 6 9 5 11 4
- 2 7 5 6 11 2 5 4 9
- 2 7 2 6 5 11 5 9 4
- 2 5 11 6 7 4 9 5 2

Save

Question 27 (5 points)

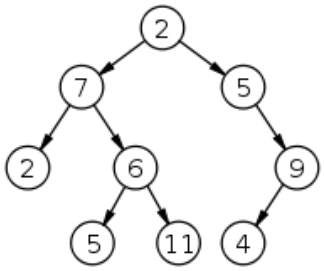


Given the binary tree, a level order traversal would yield _____.

- 2 7 5 2 6 9 5 11 4
- 2 7 5 6 11 2 5 4 9
- 2 7 2 6 5 11 5 9 4
- 2 5 11 6 7 4 9 5 2

Save

Question 28 (5 points)

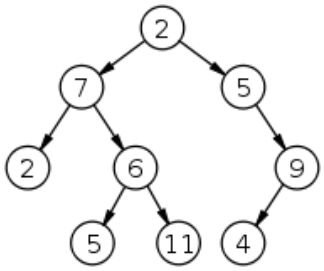


Given the binary tree, a pre-order traversal would yield _____.

- 2 7 5 2 6 9 5 11 4
- 2 7 5 6 11 2 5 4 9
- 2 7 2 6 5 11 5 9 4
- 2 5 11 6 7 4 9 5 2

Save

Question 29 (5 points)



Given the binary tree, a post-order traversal would yield _____.

- 2 7 5 2 6 9 5 11 4
- 2 7 5 6 11 2 5 4 9
- 2 7 2 6 5 11 5 9 4
- 2 5 11 6 7 4 9 5 2

Save

Question 30 (5 points)

A level-order traversal can be implemented with a queue and a list.

- True
- False

Save

Question 31 (5 points)

Every node of a tree is also a tree which is why recursive algorithms work so well with trees.

- True
- False

Save

Question 32 (1 point)

Which of the following are the right steps to remove and return the linear node pointed to by current if it is not the first node in the list and previous points to the node before current.

- previous.setNext(current.getNext());
  return current;
- current.setNext(previous.getNext());
  return previous;
- current.setPrevious(current.getNext());
  return previous;
- previous.setNext(current.getPrevious());
  return previous;

Save

Question 33 (1 point)

Which of the following are the right step(s) to remove the first node of a linked list?

- front = front.getNext();
- if (front == rear)
  rear = front.getNext();
  front = front.getNext();
- front.setNext(rear);
- none of the above

Save

Question 34 (1 point)

Which of the following are the right step(s) to remove the last node of a linked list assuming that current points to that node and that previous points to the node before current?

- previous.setNext(current);
  rear = current;
- rear.setPrevious(previous);
- previous.setNext(null)
  rear = previous;
- none of the above

Save

Question 35 (1 point)

At the point in the following loop marked by the XXXXXXX, what will be the relationship between X and Y?

```
Iterator<Integer> iter = listofinteger.iterator();
while (iter.hasNext())
{
    X = iter.next();
    Y = iter.next();
XXXXXXXX
}
```

- X and Y will be equal (i.e. pointing to the same Integer object)
- X will point to an Integer and Y will point to the next Integer in the list after X.
- X will point to an Integer and Y will point to the next Integer in the list after X but only if X was not the last element in the list. In that case, an exception will occur in the line assigning a value to Y.
- none of the above

Save

Question 36 (1 point)

Which of the following are the right steps to advance the pointers in a loop that must keep track of current and previous while traversing a linked list?

- previous = current;
  current = current.getNext();
- current = current.getNext()
- previous = current;
- previous = current;
  current = current.next;

Save

Question 37 (1 point)

Performing a radix sort on a collection of data where the key is 12 digits long and each digit is limited to the range 0 to 4 will require _____ passes and require _____ queues per pass.

Save

Question 38 (1 point)

Performing a radix sort on a collection of data where the key is 20 digits long and each digit is limited to the range 0 to 3 will require _____ passes and require _____ queues per pass.

Save

Question 39 (1 point)

The use of generic types allows a developer to create a collection _____.

- that can operate on any object type
- where the type of the object that the collection will operate on is determined at runtime instead of compile time
- both 1 & 2
- none of the above

Save

Question 40 (1 point)

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

- True
- False

Save

Question 41 (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 42 (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 43 (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 44 (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 45 (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 46 (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 47 (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 48 (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 49 (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 50 (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
- $n\log n$
- none of the above

Save

Question 51 (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 52 (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 53 (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 54 (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 55 (1 point)

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

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

Save

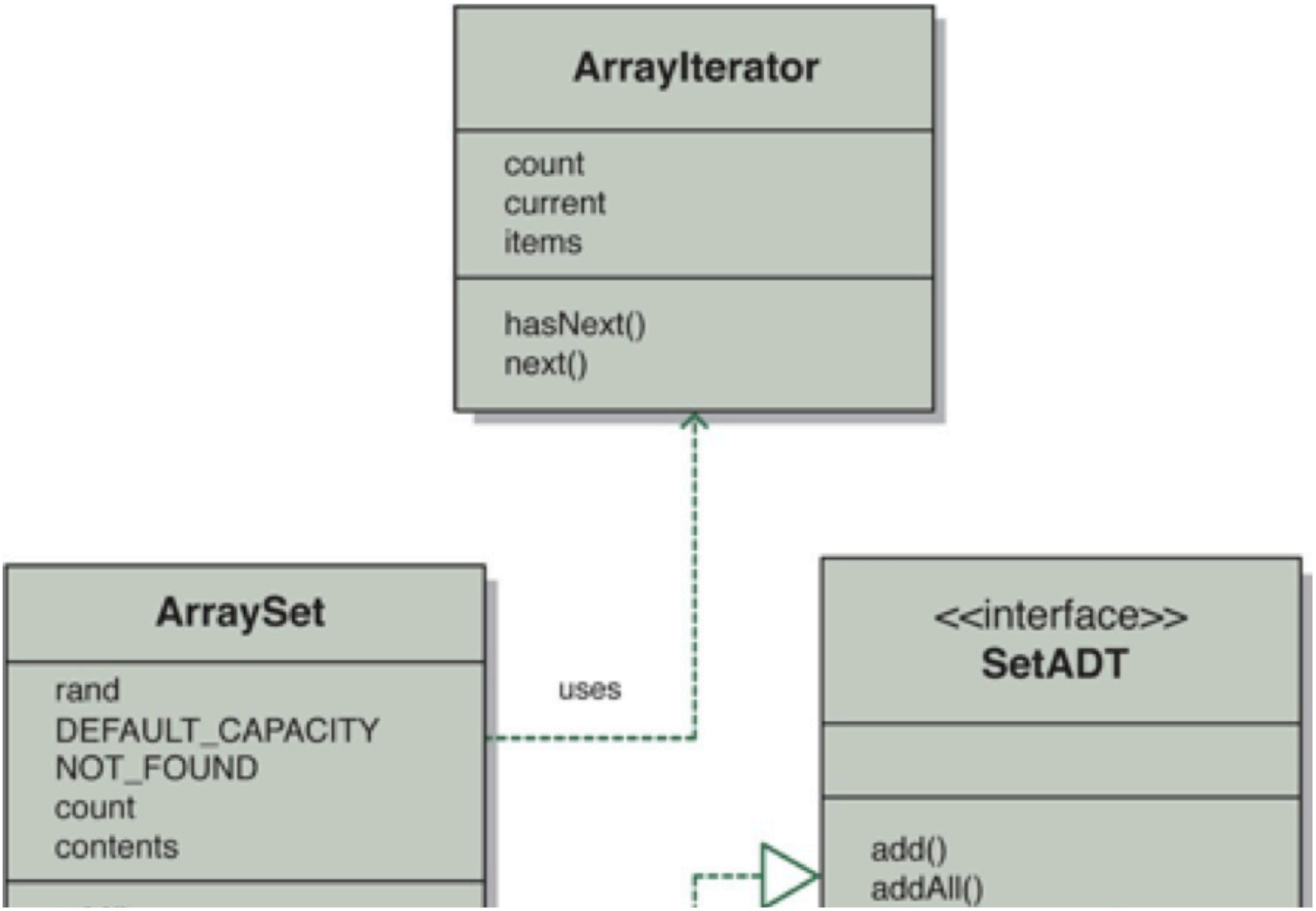
Question 56 (1 point)

The three basic operations on a Stack are _____.

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

Save

Question 57 (1 point)



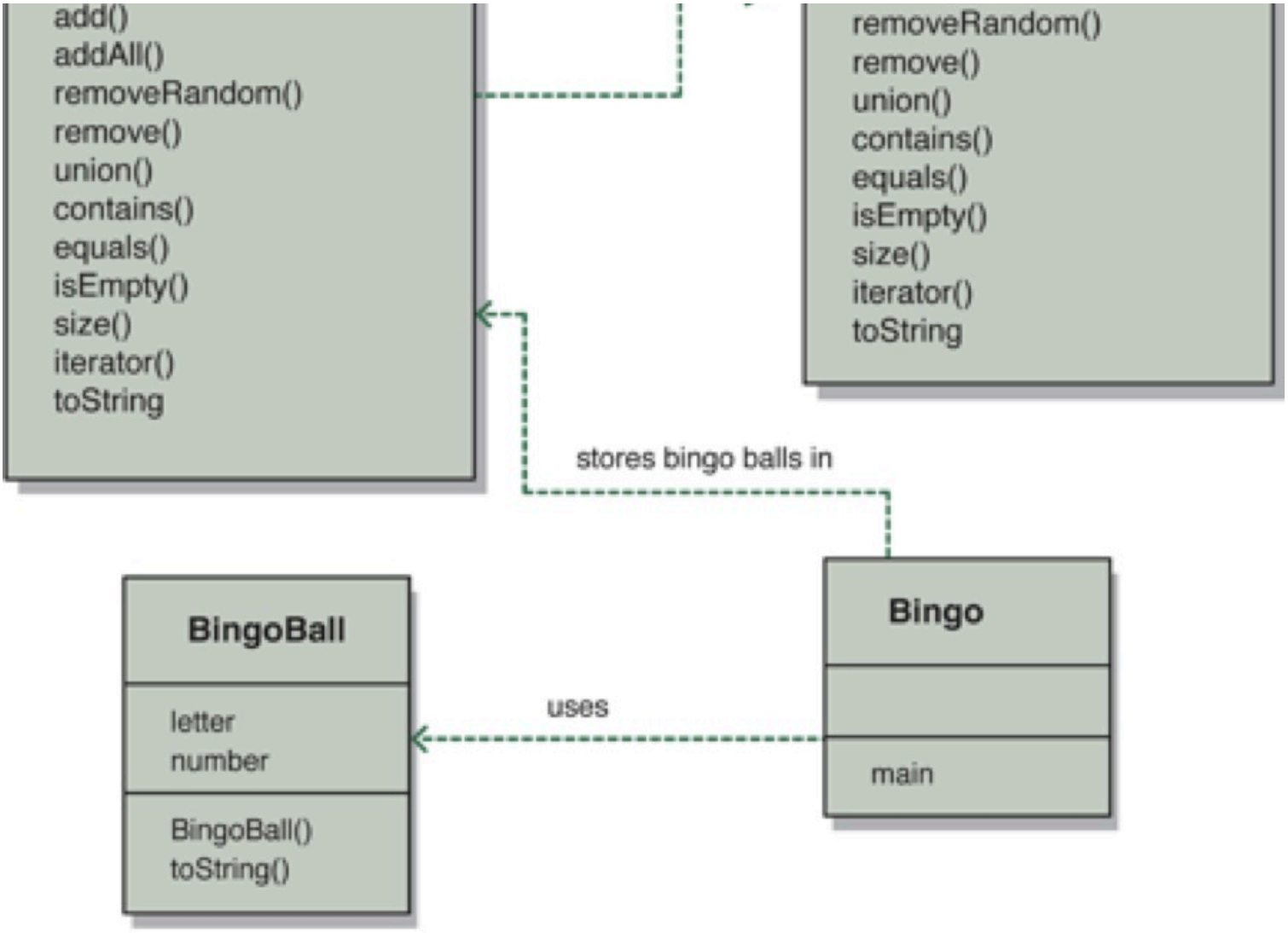


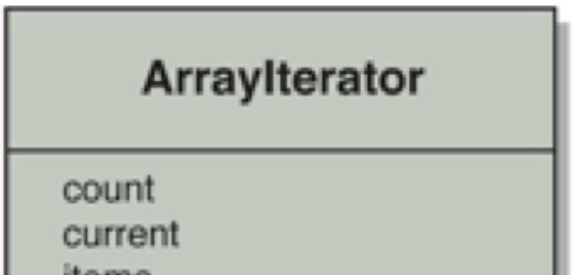
FIGURE 3.10 UML description of the bingo system

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

- methods
- attributes
- interfaces
- none of the above

Save

Question 58 (1 point)



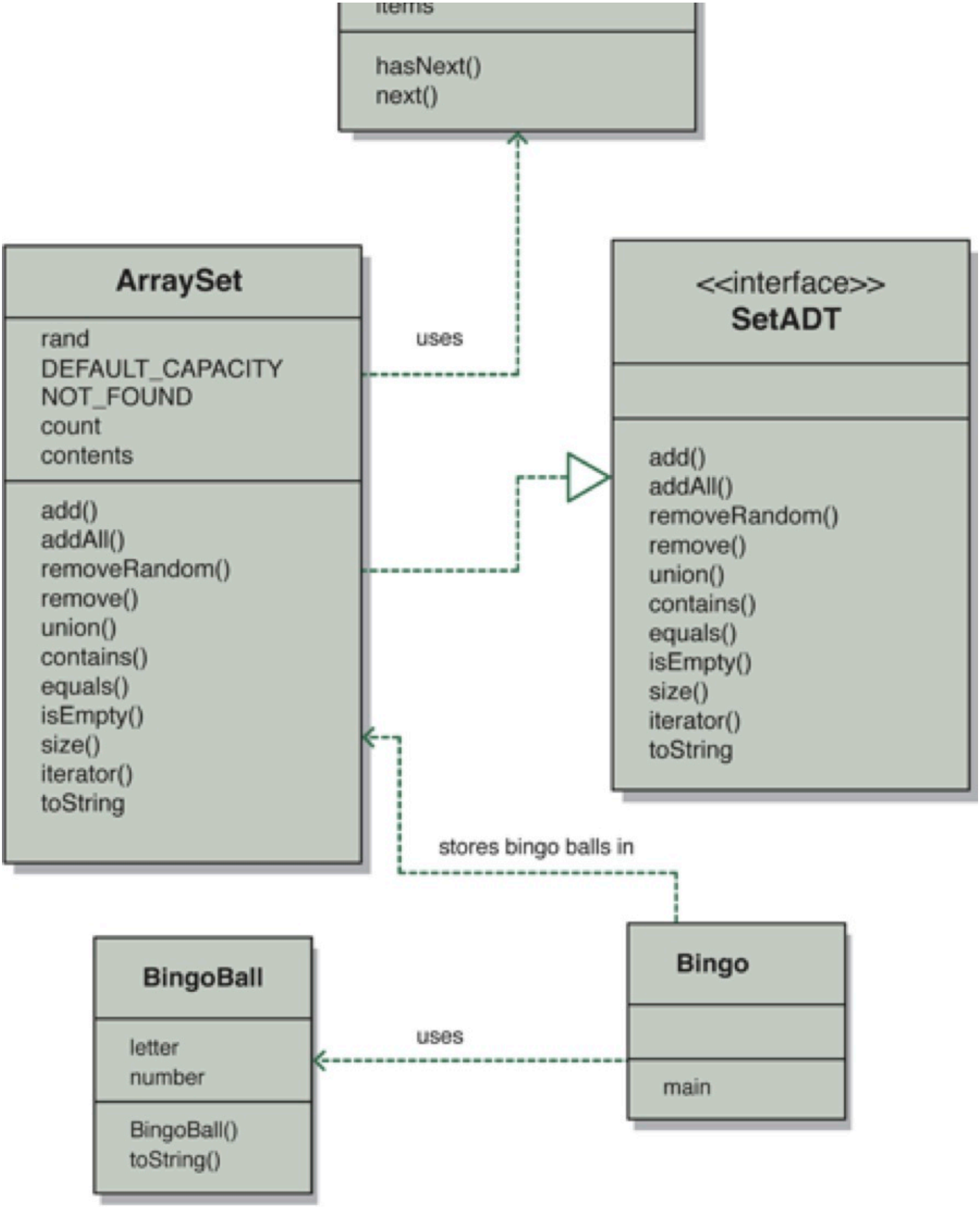


FIGURE 3.10 UML description of the bingo system

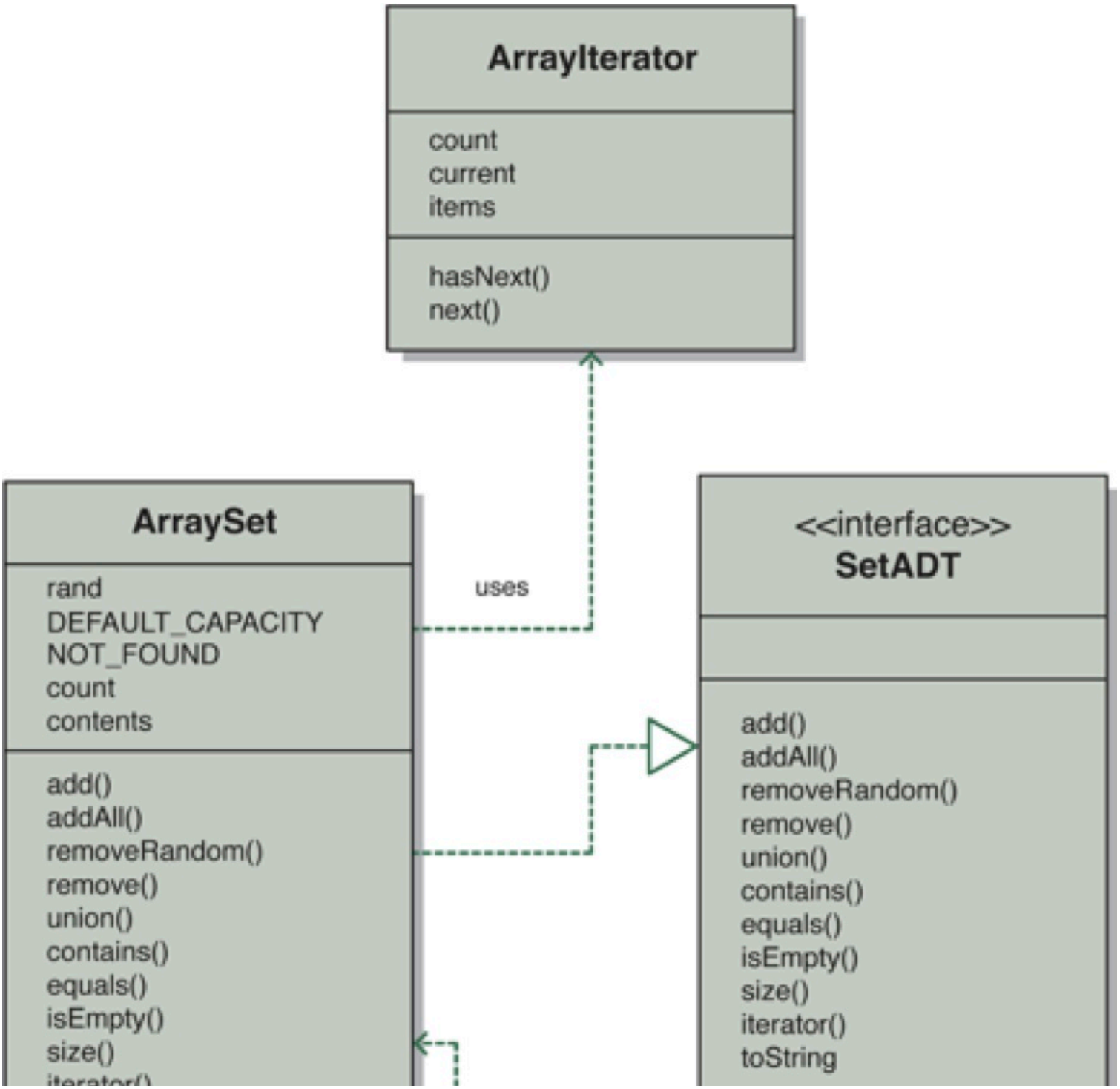
FIGURE 3.10 UML description of the bingo system

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

- methods
- attributes
- interfaces
- none of the above

Save

Question 59 (1 point)



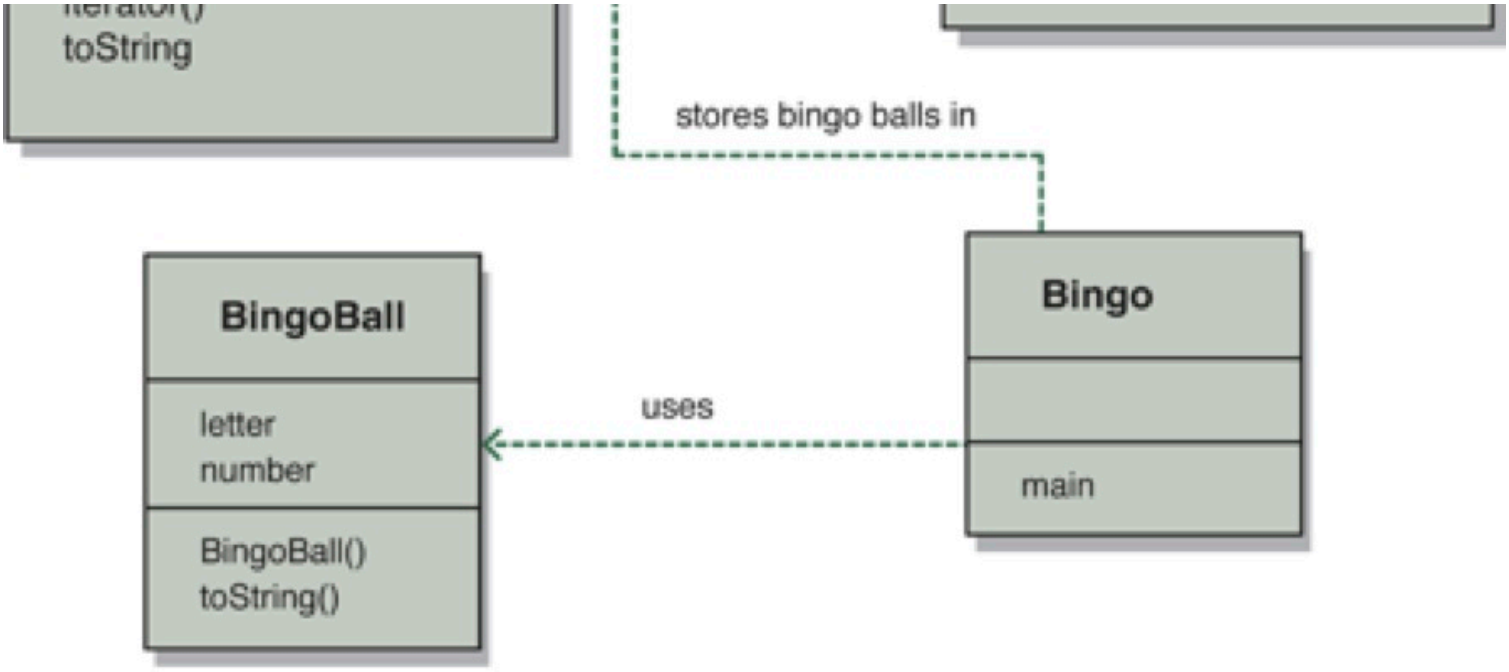


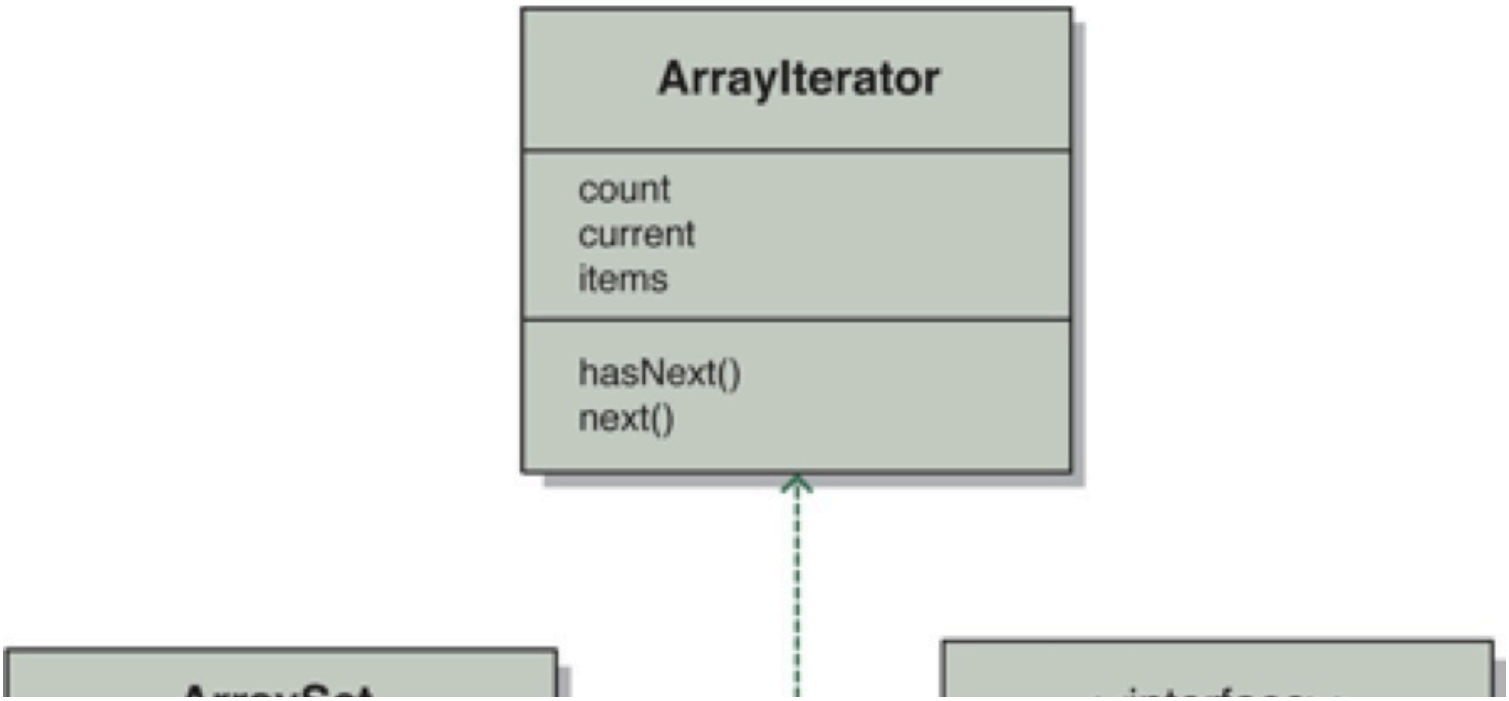
FIGURE 3.10 UML description of the bingo system

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

- inheritance
- implementation
- uses
- none of the above

Save

Question 60 (1 point)



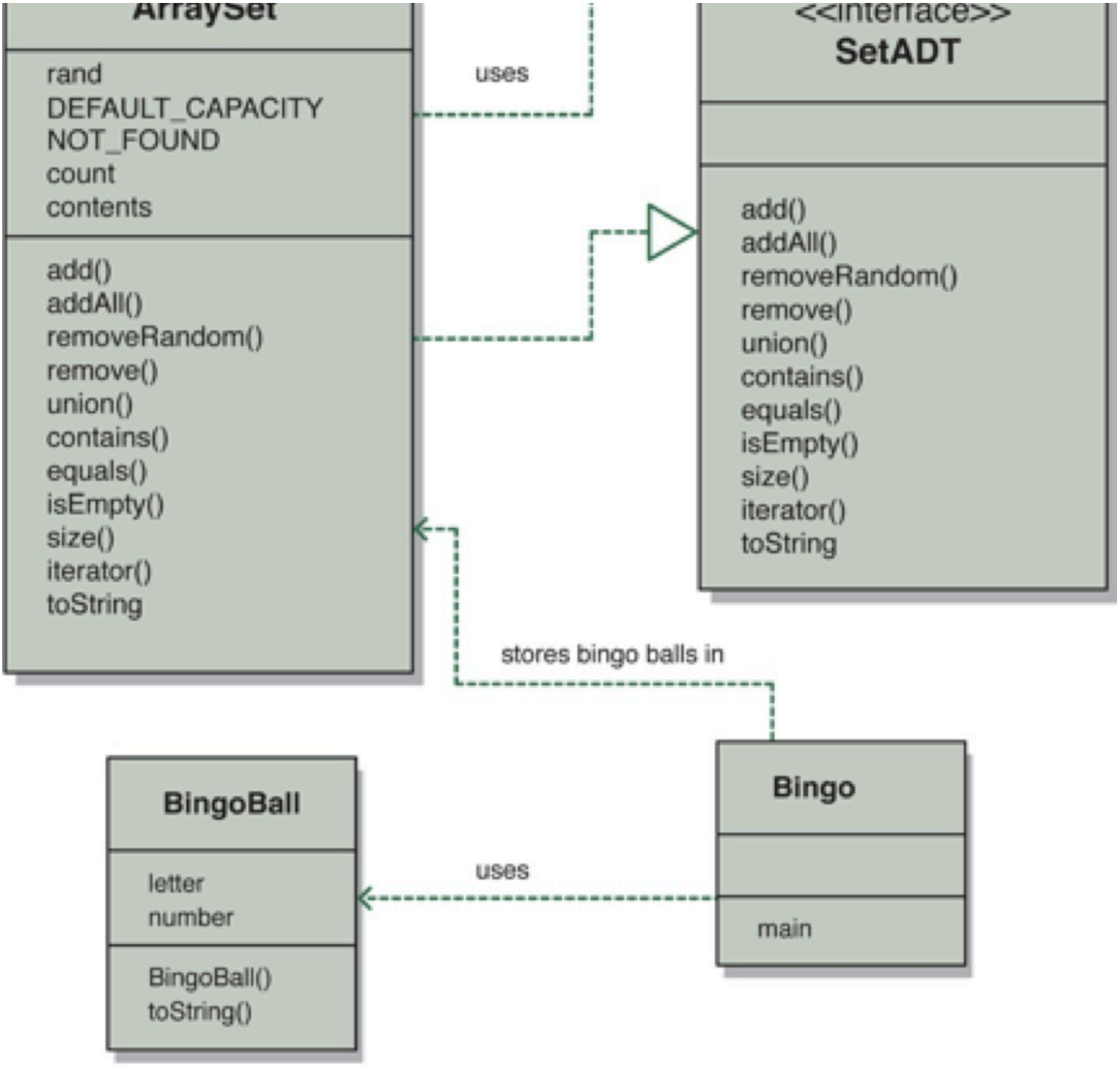


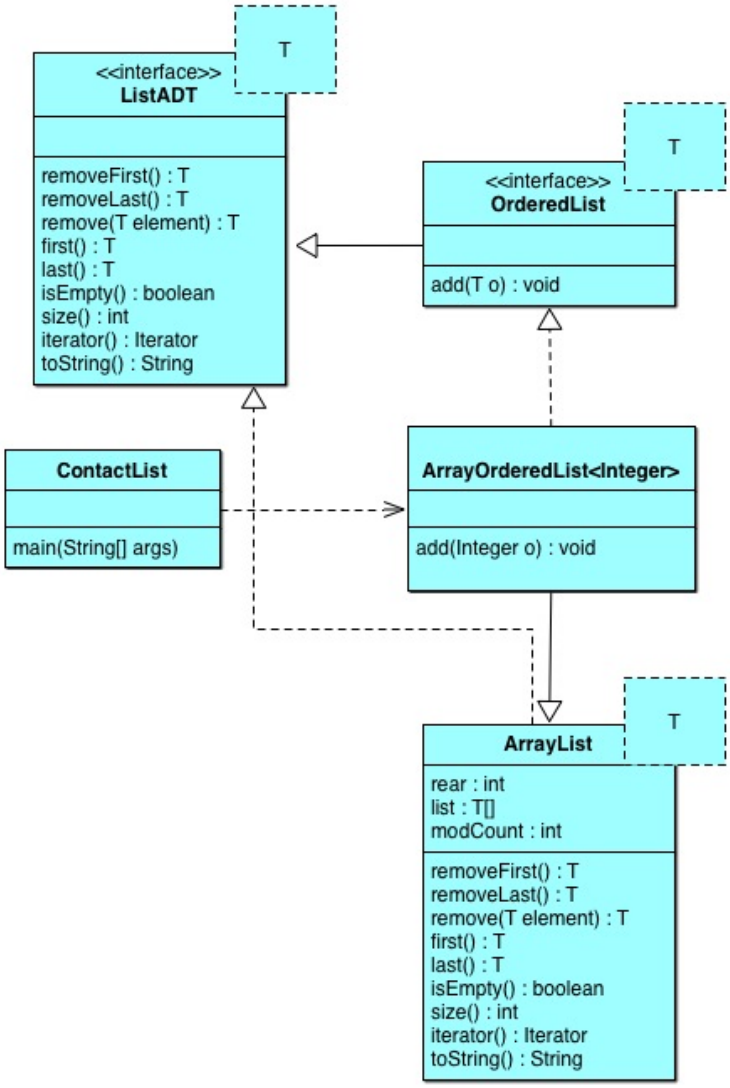
FIGURE 3.10 UML description of the bingo system

In the image above the relationship between Bingo and BingoBall is

- inheritance
- implementation
- uses
- none of the above

Save

Question 61 (1 point)

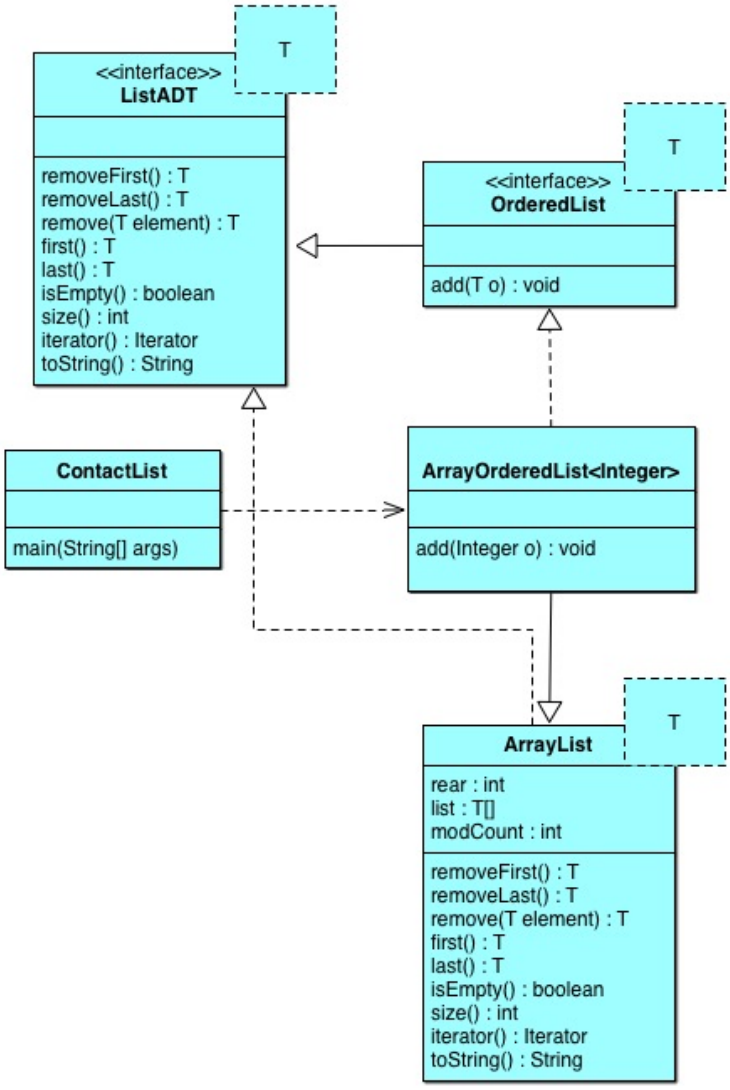


In the image above, the relationship between ArrayList and ListADT requires that ArrayList _____ all of the methods of ListADT.

- use
- inherit
- implement
- none of the above

Save

Question 62 (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 63 (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 64 (1 point)

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

- reliability
- robustness
- correctness
- none of the above

Save

Question 65 (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 66 (1 point)

Given a class called Ball, the following code:

Ball x = new Ball();

creates 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 67 (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 68 (1 point)

One purpose of inheritance is to _____ existing software.

- reuse
- alter
- protect
- none of the above

Save

Question 69 (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 70 (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 71 (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 72 (1 point)

Public variables violate encapsulation.

- True
- False

Save

Question 73 (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 74 (1 point)

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

- True
- False

Save

Question 75 (1 point)

A constructor must NOT have an explicit return type.

- True
- False

Save

Question 76 (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 77 (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 78 (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 79 (1 point)

An array has no set capacity limitations other than the size of the computer's memory whereas the size of a linked list is determined when it is created and cannot be changed.

- True
- False

Save

Question 80 (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 81 (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 82 (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 83 (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 84 (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 85 (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 86 (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 87 (1 point)

Which of the following is NOT an aspect of software quality

- Correctness
- Credibility
- Usability
- Robustness

Save

Question 88 (1 point)

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

- $3n+5+2^n$
- $\log n + 6\log n + 2$
- $3n+4$
- $n\log n$

Save

Question 89 (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 90 (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 91 (1 point)

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

- Reliability
- Usability
- Efficiency
- Robustness

Save

Question 92 (1 point)

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

- add
- enqueue
- push
- pop

Save

Question 93 (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 94 (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 95 (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 96 (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 97 (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 98 (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 99 (1 point)

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

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

Save

Question 100 (1 point)

The following code:

String x;

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

- True
- False

Save

Question 101 (1 point)

The elements of a(n) _____ list have an inherent relationship defining their order.

- ordered
- unordered
- indexed
- linked

Save

Question 102 (1 point)

Any recursive definition must have a non-recursive part, called the _____, which permits the recursion to eventually end.

- terminal
- default
- base case
- none of the above

Save

Question 103 (1 point)

_____ is the process of arranging a list of items into a defined order based on some criteria.

- searching
- sorting
- classifying
- categorizing

Save

Question 104 (1 point)

A _____ is a linear collection whose elements are added on one end and removed from the other.

- stack
- queue
- list
- tree

Save

Question 105 (1 point)

Recursion is a programming technique in which a method calls itself either directly or indirectly.

- True
- False

Save

Question 106 (1 point)

_____ is the process of finding a designated target within a group of items or determining that it doesn't exist.

Save

Question 107 (1 point)

When one enqueue's an element to a queue, you add that element to the _____ of the queue

Save

Question 108 (1 point)

UnOrdered lists have no inherent order but are ordered by their placement in the list

- True
- False

Save

Question 109 (1 point)

If a problem can be solved with iteration, it cannot be solved with recursion

- True
- False

Save

Question 110 (1 point)

1. An efficient search

_____ the number of comparisons made.

Save

Question 111 (1 point)

If method m1 invokes m2 which invokes m3 which invokes m1 again, then this is an example of _____

Save

Question 112 (1 point)

Classes that implement the Comparable interface provide a compareTo method to compare objects of that class. What type does a compareTo method return?

- Integer
- int
- boolean
- same type as the class

Save

Question 113 (1 point)

A recursive definition without a base-case will lead to _____

Save

Question 114 (1 point)

What are the three primary operations on a queue?

- enqueue, dequeue, first (or front)
- push, pop, peek
- addtorear, removefirst, first
- none of the above

Save

Question 115 (1 point)

Only Comparable objects may be stored in an ordered list.

- True
- False

Save

Question 116 (1 point)

Which of these have the smallest expected case time complexity?

- bubble sort
- selection sort
- merge sort
- insertion sort

Save

Question 117 (1 point)

Some problems can only be solved recursively

- True
- False

Save

Question 118 (1 point)

_____ orders a list of values by repetitively comparing neighboring elements and swapping their positions if necessary

- bubble sort
- merge sort
- selection sort
- quick sort

Save

Question 119 (1 point)

_____ orders a list of values by repetitively finding the next smallest element in the list and swapping into the next position to fill.

- bubble sort
- merge sort
- selection sort
- quick sort

Save

Question 120 (1 point)

_____ orders a list of values by recursively decomposing a list into lists of length one and then using recursive backtracking to merge the lists in order on the way back.

- bubble sort
- merge sort
- selection sort
- quick sort

Save

Question 121 (1 point)

_____ orders a list of values by recursively decomposing a list using a carefully chose partition element.

- bubble sort
- merge sort
- selection sort
- quick sort

Save

Question 122 (1 point)

In a circular array implementation of a queue, there are two indexes that are maintained, front and rear. The only time front and rear will be equal is when the queue is empty.

- True
- False

Save

Question 123 (1 point)

The equation to update the front index in a circular array queue is

- front = (front + 1) % queue.length
- front = (front -1) % queue.length
- front = front + 1
- none of the above

Save

Question 124 (1 point)

_____ search eliminates half of the search pool with each step and thus is O(_____) as long as the search pool is _____

Save

Question 125 (1 point)

The best time complexity that can be achieved using a comparsion sort is O(_____)

- n
- log n
- n log n
- none of the above

Save

Question 126 (1 point)

Bubble Sort, Selection Sort, and Insertion Sort all have expected case time complexity O(_____)

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

Save

Question 127 (1 point)

Each time a method is called, an activation record is created and place on the run-time stack containing

- parameters passed to that method
- local variables for that method
- a program counter for that method to keep track of which line of code is the next to be executed
- all of the above

Save

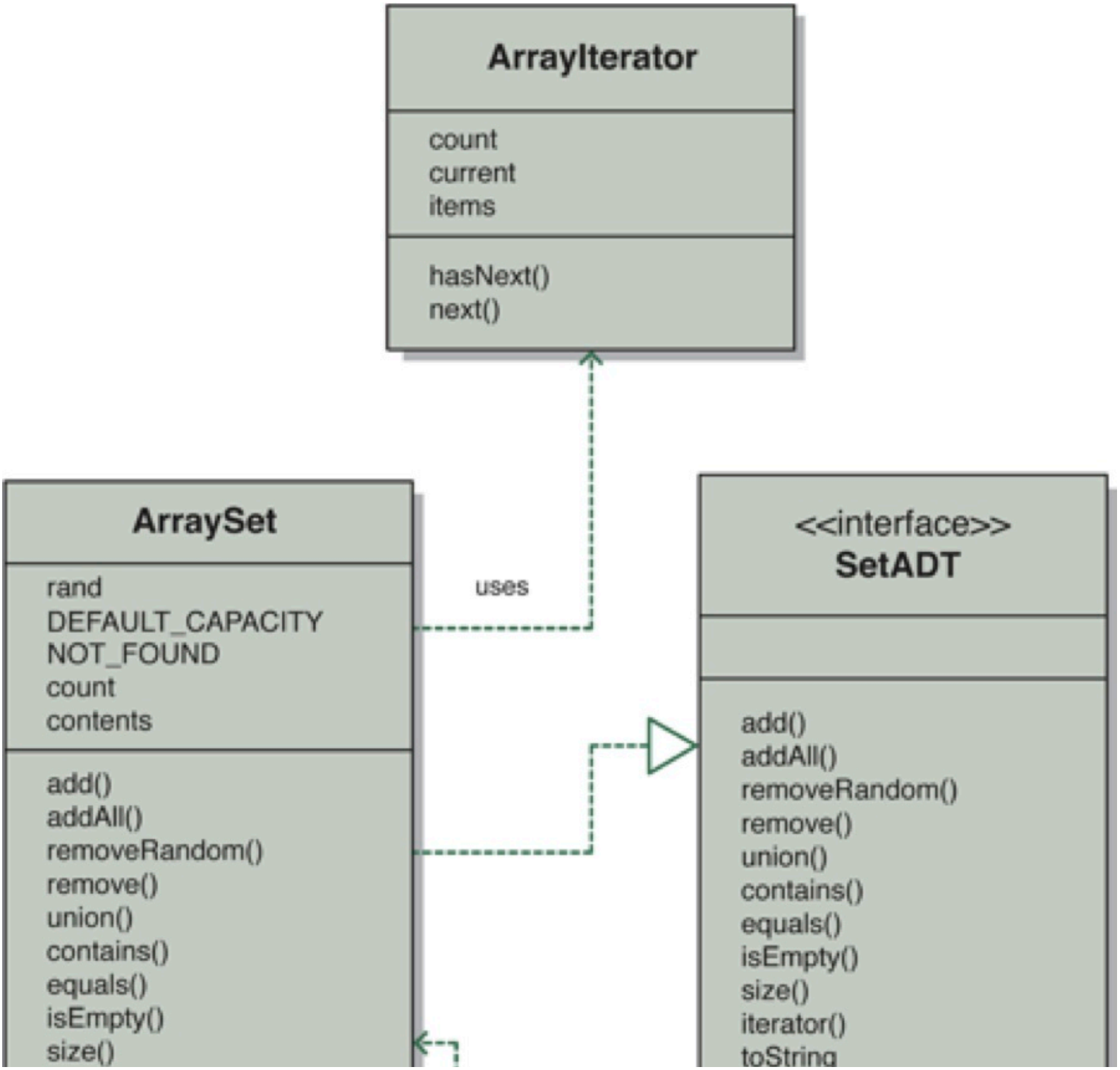
Question 128 (1 point)

One purpose of inheritance is to _____ existing software.

- reuse
- alter
- protect
- none of the above

Save

Question 129 (1 point)



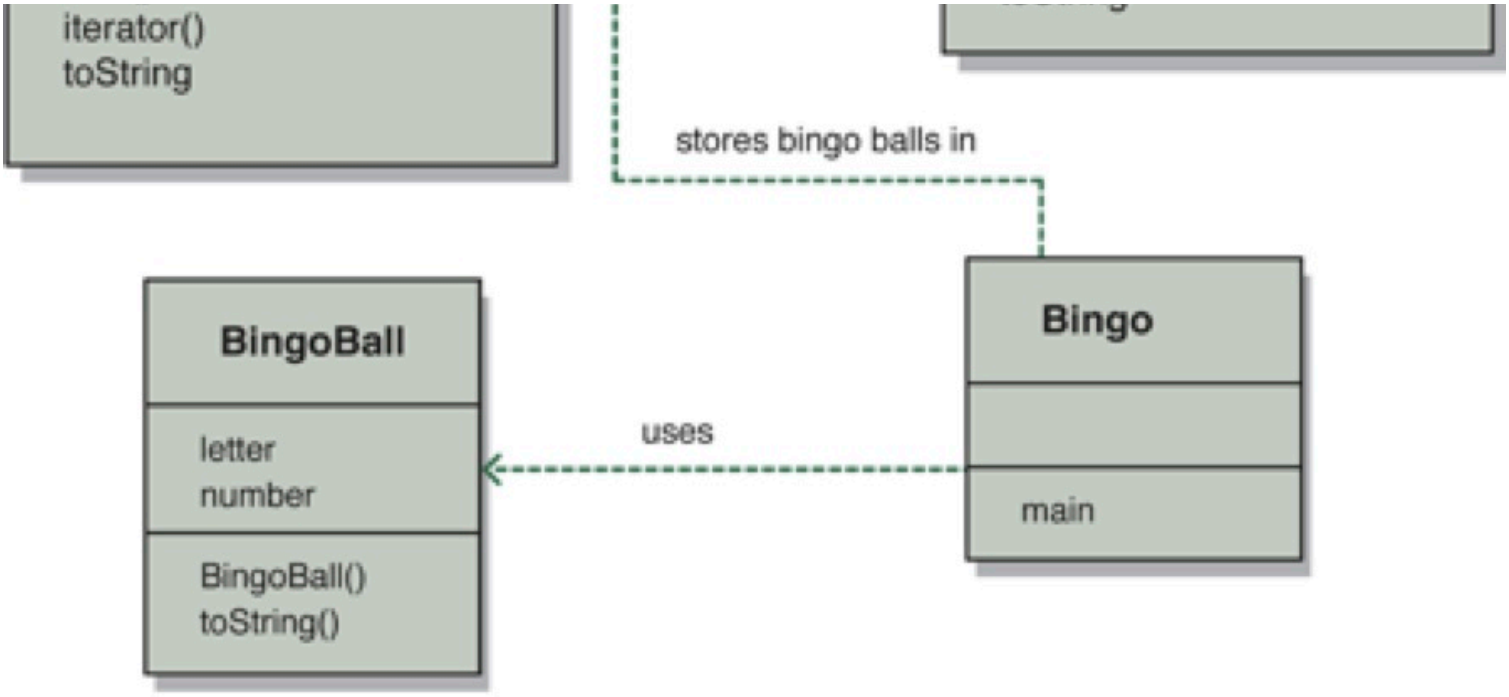


FIGURE 3.10 UML description of the bingo system

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

- True
- False

Save

Question 130 (1 point)

The pop operation is implemented 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.

- True
- False

Save

Question 131 (1 point)

A linked structure uses object reference variables to link one object to another.

- True
- False

Save

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