What is the sum of $A8_{16}$ and 110111_2?

A. FF_{16} B. 10111111_2 C. DF_{16} D. 99_{10} E. 777_8

What is output by the code to the right?

A.   4   B.   14   C.   0

D.   14   E.   5

```
int x = 14;
int y = 5;
System.out.print( x % y );
```

What is output by the code to the right?

A.   10   B.   11   C.   9

D.   0   E.   1

```
int amt = 0;
for(int i = 0; i <= 10; i++)
  amt++;
System.out.print( amt );
```

What is output by the code to the right?

A.   ajRed   B.   ajRe   C.   jRed

D.   jRedd   E.   ajred

```
String s = "RajReddy";
System.out.print( s1.substring(1,5) );
```

What is output by the code to the right?

A.   0   B.   2

C.   1   D.   null

E.   There is no way to predict the output.

```
int[] vals = new int[5];
System.out.print( vals[2] );
```

What is output by the code to the right?

A.   0.5   B.   2

C.   2.0   D.   1.5

E.   There is no output due to a syntax error.

```
int x = 1;
double a = 2.5 - x;
System.out.print( a );
```

How many combinations of values for the `boolean` variables a, b, and c will result in d being set to `true`?

A.   16   B.   0   C.   5

D.   8   E.   3

```
boolean a, b, c;
//code to initialize a, b, and c

boolean d = ( a && b || c );
```

QUESTION 8

What is output by the code to the right?

A. yesno   B. noyes   C. yes

D. no   E. There is no output.

```
int x = 5;
if( x < 5 )
  System.out.print( "yes" );
else
  System.out.print( "no" );
```

QUESTION 9

What replaces **<*1>** in the code to the right so that the instance variable side can only be accessed by the Square class?

A. public

B. private

C. protected

D. package

E. only

Assume **<*1>** is filled in correctly.

QUESTION 10

What is output by the client code to the right?

A. 4

B. 2

C. 9

D. 0

E. 1

```
public class Square{
  <*1> int side;

  public Square(int s){
    side = s;
  }

  public void grow(){
    side++;
  }

  public int getArea(){
    return side * side;
  }

}

/////////////////////////////////////
//client code
Square sq = new Square(2);
sq.grow();
System.out.print( sq.getArea() );
```

QUESTION 11

What is output by the code to the right?

A. 7   B. -7   C. 25

D. 33   E. 29

```
int x = 13;
int y = 20;
System.out.println( y ^ x );
```

QUESTION 12

What is output by the code to the right?

A. 1.0   B. 1   C. 2

D. 0.0   E. NaN

```
System.out.println( Math.pow( 2.0, 0.0 ) );
```

QUESTION 13

What is output by the code to the right?

A. word   B. "word"   C. \\word

D. \word   E. \ord

```
System.out.print("\\word");
```

QUESTION 14

What is output by the code to the right?

A. 2.55   B. 2.56   C. 2.559

D. 2   E. %4.2f 2.559

```
System.out.printf("%4.2f", 2.559);
```

QUESTION 15

What is returned by the method call `sample(-5)`?

A. 0   B. -10   C. -5

D. 25   E. -25

```
public static int sample(int x){
  return x - x;
}
```

QUESTION 16

What is output when method `use` is called?

A. 10-142

B. -12410

C. 01234

D. 24-110

E. 4-1210

```
public static void myst(int[] data){
  int min, temp;
  for(int i = 0; i < data.length; i++){
    min = 0;
    for(int j = i + 1; j < data.length; j++){
      if( data[j] < data[min] )
        min = j;
    }
    temp = data[min];
    data[min] = data[i];
    data[i] = temp;
  }
}

public static void use(){
  int[] data = {10, -1, 4, 2};
  myst(data);
  for(int i : data)
    System.out.print( i );
}
```

QUESTION 17

Method `myst` attempts to implement the selection sort algorithm, but has a logic error. Which of the following changes will correct the logic error?

A. Replace `min = 0` with `min = data[i]`.

B. Replace `j = i + 1` with `j = i`.

C. Replace `min = 0` with `min = i`.

D. Replace `temp = data[min]` with `temp = data[0]`.

E. Replace `min = j` with `min = data[j]`.

QUESTION 18

What is output by the code to the right?

A. [4, 2]   B. [4]   C. [2]

D. [2, 4]   E. [0, 2, 4]

```
ArrayList<Integer> nums =
                 new ArrayList<Integer>();
nums.add(2);
nums.add(4);
System.out.println(nums);
```

QUESTION 19

What is returned by the method call `two(7)`?

A. 1   B. 3   C. 5

D. 6   E. 4

```
public static int two(int x){
  if( x <= 2 )
    return 1;
  else
    return 1 + two( x - 2 );
}
```

QUESTION 20

What is output by the code to the right?

A. 17   B. 18   C. 1.7776

D. 1   E. 2

```
double a = 1.7776;
System.out.print( (int)( a * 10 ) );
```

QUESTION 21

What is output by the code to the right?

A. 0   B. 3   C. 4

D. t   E. e_t

```
String sample = "the_thirty_three";
String[] parts = sample.split("h");
System.out.print( parts.length );
```

QUESTION 22

What is output by the code to the right?

A. baaba   B. abaaba   C. aaa

D. aba   E. abaa

```
String w1 = "a";
String w2 = "ba";
System.out.println( w1 + w2 + w1 );
```

QUESTION 23

What is output by the code to the right?

A. 1234   B. 521

C. 3632   D. 2521

E. There is no output due to a an
    ArrayOutOfBoundsException.

```
int[] list = {2, 5, 2, 1};
for( int val : list )
  System.out.print( val + 1 );
```

QUESTION 24

Which of the following is closest to the value method
count will most likely return?

A. 1.0 / n   B. 0   C. n

D. 0.5 * n   E. n * n

```
public static int count(int n){
  int ct = 0;
  for(int i = 0; i < n; i++)
    if( Math.random() < 0.5 )
      ct++;
  return ct;
}
```

QUESTION 25

What is output by the code to the right?

A. 8   B. 6

C. 13   D. 12

E. 11

```
int count = 2;
int[][] mat = new int[3][4];

for(int r = 0; r < mat.length; r++){
  for(int c = 0; c < mat[0].length; c++){
    mat[r][c] = count;
    count++;
  }
}

System.out.print( mat[2][2] );
```

What is output by the code to the right?

A.	13	B.	16	C.	4

D. 24   E. 21

```
int x = 4;
int y = 3;
x *= y + 1;
System.out.print( x );
```

What is output by the code to the right when given this input?

```
value1 is 10
value2 is 12
```

A. value1is

B. value1 is 10value2 is 12

C. value1 is 10
    value2 is 12

D. 10 12

E. value1 is

```
Scanner sc = new Scanner(System.in);
System.out.print( sc.next() );
System.out.print( sc.next() );
```

What is output by the code to the right?

A.	10	B.	4	C.	5

D. 6   E. 1

```
int limit = 10;
int testVar = 1;
while( testVar < limit ){
  testVar++;
  limit--;
}
System.out.print( limit );
```

What is output by the line marked //1 in the client code to the right?

A.	ic1	B.	5	C.	obj@12x

D. val: 0   E. val: 5

What is output by the line marked //2 in the client code to the right?

A.	val: 6	B.	val: 5	C.	val: 0

D. 5   E. 0

```
public class IntCell{

  private int val;

  public IntCell(int x){
    val = x;
  }

  public void inc(){
    val++;
  }

  public String toString(){
    return "val: " + val;
  }
}

/////////////////////////////////////////
//client code
IntCell obj = new IntCell(5);
System.out.println( obj ); //1
IntCell otherObj = obj;
otherObj.inc();
otherObj = new IntCell(0);
System.out.println( obj.toString() ); //2
```

Which of the following best describes what method `eval` returns?

A. The minimum of the three parameters.

B. The maximum of the three parameters.

C. How many of the three parameters equal each other.

D. The range of the three parameters.

E. The sum of the three parameters.

Which of the following replaces **<*1>** in the code to the right to create a two dimensional array of `ints` with one more row than the number of characters in the `String s` and one more column than then number of characters in the `String t`?

A. `int[s.length()][t.length()]`

B. `new int[t.size()+1][s.size()+1]`

C. `new int[i + 1][j + 1]`

D. `new int[n + 1][m + 1]`

E. More than one of these.

Assume **<*1>** is filled in correctly.

What is returned by the method call
`comp("uilcs", "uilcs")` ?

A. 6

B. 5

C. 3

D. 2

E. 0

What is returned by the method call
`comp("state", "stilte")` ?

A. 2

B. 3

C. 4

D. 5

E. 6

```java
private static int eval (int a, int b, int c){
  int m;
  m = a;
  if (b < m)
    m = b;
  if (c < m)
    m = c;
  return m;
}

public static int comp (String s, String t){
  int d[][];
  int n, m, i, j;
  char si, tj, cost;

  n = s.length ();
  m = t.length ();
  if (n == 0)
    return m;
  if (m == 0)
    return n;

  d = <*1>;
  for (i = 0; i <= n; i++)
    d[i][0] = i;

  for (j = 0; j <= m; j++)
    d[0][j] = j;

  for (i = 1; i <= n; i++) {
    si = s.charAt (i - 1);
    for (j = 1; j <= m; j++) {
      tj = t.charAt (j - 1);

      if (si == tj)
        cost = 0;
      else
        cost = 1;

      d[i][j] = eval(d[i-1][j]+1,
              d[i][j-1]+1, d[i-1][j-1] + cost);
    }
  }
  return d[n][m];
}
```

Consider the `Node` and `Structure` classes to the right. What is output by the following code?

```
Structure s1 = new Structure();
System.out.println( s1.find() );
```

A. null   B. 0

C. 1   D. -1

E.   There is no output due to a runtime error.

What is output by the following code?

```
int[] values = {2, 1, -1, 2, 5};
Structure s2 = new Structure();
for(int i : values )
  s2.add( i );
s2.show();
```

A. 251-1   B.   -1125   C.   2251-1

D. -11225   E.   21-15

What is output by the following code?

```
int[] values3 = {2, 1, -1, 2, 5};
Structure s3 = new Structure();
for(int i : values3 )
  s3.add( i );
System.out.print( s3.find() );
```

A. 3   B.   2   C.   1

D. 0   E.   -1

What type of data structure does the `Structure` class implement?

A.   A binary search tree.

B.   A linked list.

C.   A min heap.

D.   A max heap.

E.   A hash table.

```java
public class Node{
  public int val;
  public Node lc;
  public Node rc;
}
------------------------------------------
public class Structure{
  private Node myCon;

  public void add(int v){
    myCon = add(v, myCon);
  }

  private Node add(int v, Node n){
    if( n == null ){
      n = new Node();
      n.val = v;
    }
    if( v < n.val )
      n.lc = add(v, n.lc);
    else if( v > n.val )
      n.rc = add( v, n.rc);
    return n;
  }

  public void show(){
    show(myCon);
  }

  private void show(Node n){
    if( n != null ){
      System.out.print(n.val);
      show(n.rc);
      show(n.lc);
    }
  }

  public int find(){
    return find(myCon);
  }

  private int find(Node n){
    if( n == null )
      return -1;
    return 1
      + Math.max( find(n.lc), find(n.rc) );
  }
}
```

What is output by the code to the right when the method call `build(5)` is made?

A.   543210   B.   43210   C.   01234

D.   1234   E.   4321

What is the running time of method `show` given a `LinkedList` with N elements? Assume the `print` method is O(1). Choose the most restrictive correct answer.

A.   O(N)   B.   O(1)   C.   O(logN)

D. $O(N^2)$ E. $O(N^3)$

```java
public void show(LinkedList<Integer> list){
  Iterator<Integer> it = list.iterator();
  while( it.hasNext() )
    System.out.print( it.next() );
}

public void build(int n){
  LinkedList<Integer> list = new
                LinkedList<Integer>();

  for(int i = 0; i < n; i++)
    list.add( i );

  show(list);
}
```