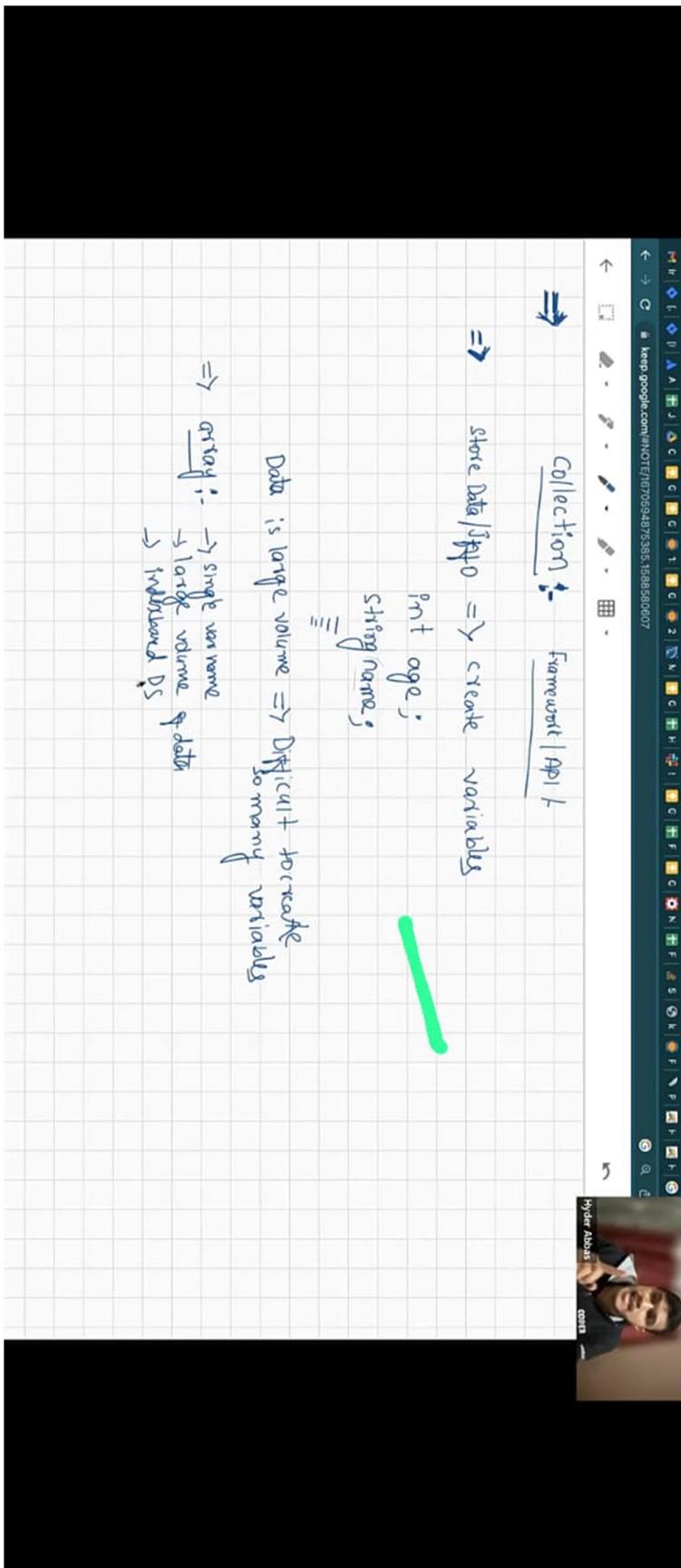
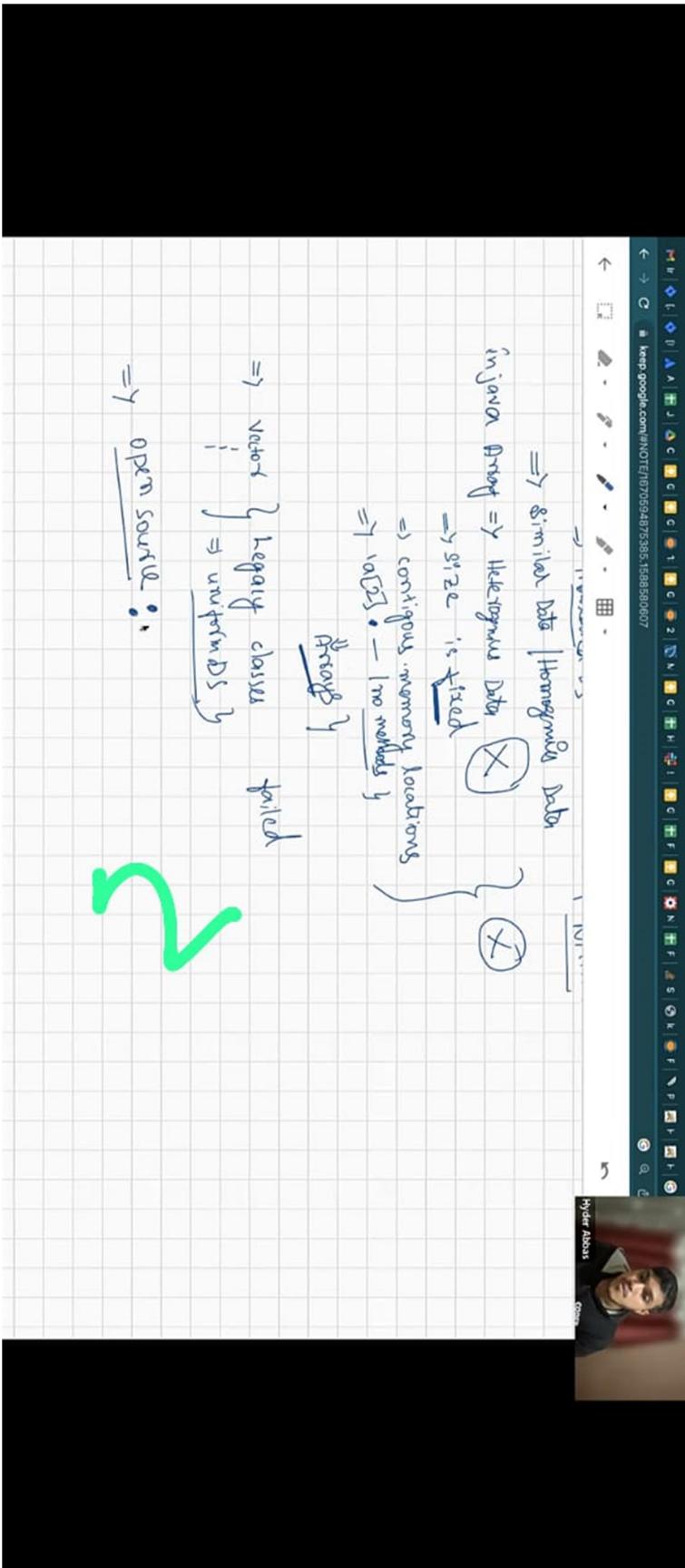
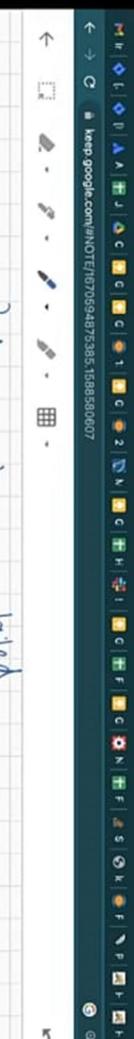


Java Collection Part-1





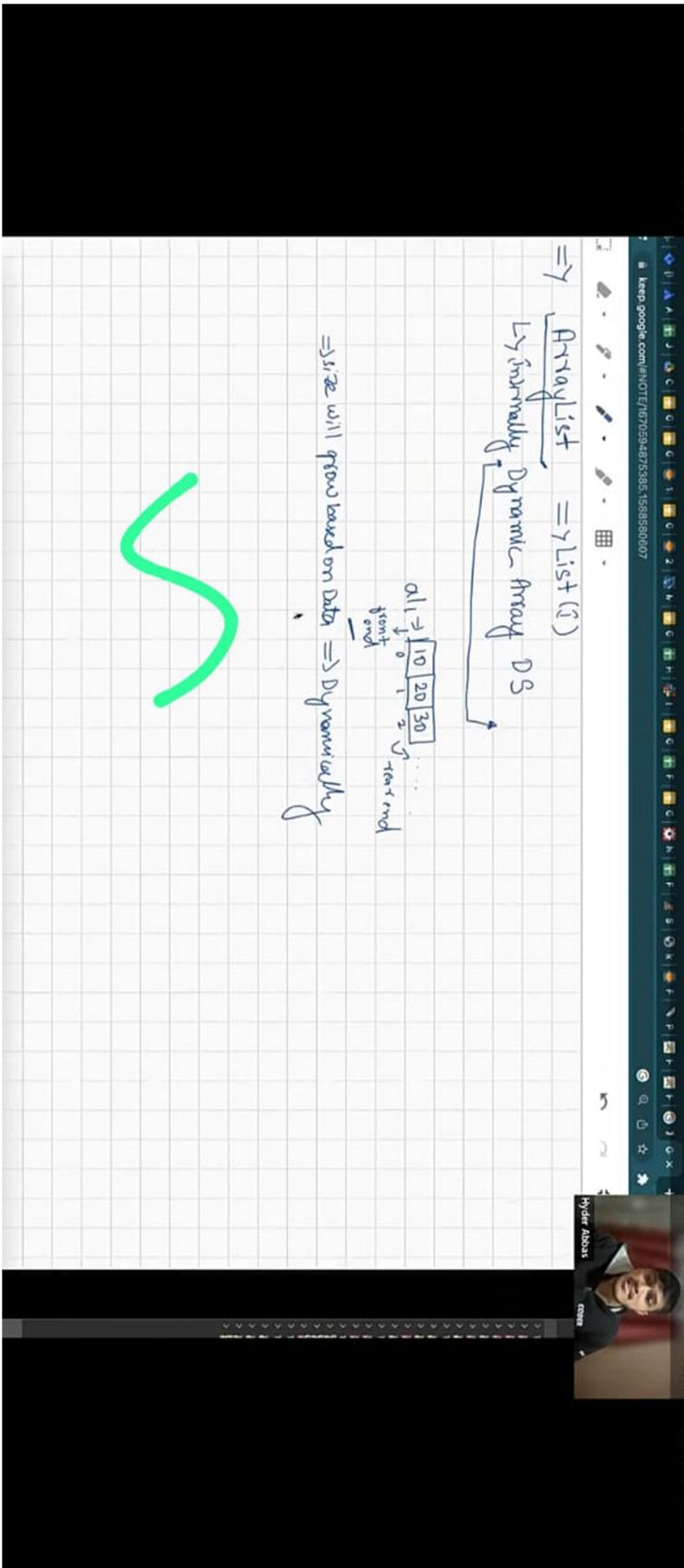


```

classDiagram
    class List {
        <<Collection>>
    }
    class ArrayList
    class LinkedList
    class PriorityQueue
    class Stack
    class Queue
    class HashSet {
        <<Map>>
    }
    class Map {
        <<Collection>>
    }
    class Collection {
        <<Set>>
    }
    class Set
    class Queue

```

4





```
1 //10 use any of the collection classes we need to imp
2 import java.util.*;
3 public class LaunchAl1
4 {
5     public static void main(String[] args)
6     {
7         ArrayList al1=new ArrayList();
8         al1.add(10);
9         al1.add(20);
10        al1.add(30);
11        //homogeneous type of data is allowed
12        System.out.println("*****");
13        System.out.println("*****");
14        System.out.println("*****");
15        System.out.println("*****");
16        System.out.println("*****");
17        System.out.println("*****");
18        System.out.println("*****");
19        System.out.println("*****");
20        System.out.println("*****");
21        System.out.println("*****");
22        System.out.println("*****");
23        System.out.println("*****");
24        System.out.println("*****");
25        System.out.println("*****");
26    }
27 }
```



The screenshot shows a Java IDE interface with two tabs open: 'NeuronArrayList.java' and 'ArrayList'. The code in 'NeuronArrayList.java' is as follows:

```
10 all.add(20);
11 //homogeneous type of data is allowed
12 System.out.println("*****");
13 System.out.println("*****");
14
15
16 ArrayList al2=new ArrayList();
17 al2.add("iNeuron");
18
19 al2.add(28);
20 al2.add(18.5);
21
22 System.out.println(al2);
23
24
25 System.out.println("*****");
26
27 // we can add entire collection into another collection
28 ArrayList al3=new ArrayList();
29 al3.addAll(al2);
30
31 System.out.println("*****");
32
33 }
34
35
36 }
```

A green arrow points from the line 'al3.addAll(al2);' to the Javadoc for the `addAll` method in the `ArrayList` class. The Javadoc is displayed in a tooltip:

`addAll(Collection c)` ↳ Public Method in `ArrayList`

Appends all of the elements in the specified collection to the end of this list, in the order that they are returned by the specified collection's iterator. The behavior of this operation is undefined if the specified collection is modified while the operation is in progress. This implies that the behavior of this list is undefined if the specified collection is this list (or this list is a monitor) and is being modified by `addAll`. In `ArrayList`, `addAll` is synchronized.

Parameters:

- `c` Collection containing elements to be added to this list.

Returns:

- `int` If this list is a monitor, a mirror of the `c` list. Otherwise, the number of elements in this list after this operation.



```
20 aL2.add(18,5);
21
22 System.out.println(aL2);
23
24
25 System.out.println("*****");
26 // we can add entire collection into another collection
27
28 ArrayList aL3=new ArrayList();
29 aL3.addAll(aL2);
30
31 System.out.println(aL3);
32
33 System.out.println("*****");
34
35
36
37
38
39
40
41
42
43
44
45
46
```

The code demonstrates adding elements to an ArrayList. It first creates an ArrayList 'aL2' and adds elements 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18. Then, it creates another ArrayList 'aL3' and adds all elements from 'aL2' to 'aL3'. Finally, it prints both lists.

ArrayList.add(int index, Object element)

This method inserts the specified element at the specified position in this list. Shifts the element currently at that position (if any) and any subsequent elements to the right (adds one to their indices). The added element is in last. Overrides: add() in **java.util.List**.

Parameters:

- index - Index at which the specified element is to be inserted
- element - Element to be inserted

Throws:

- IndexOutOfBoundsException** - If the index out of range [index < 0 || index > size()]

Overrides:

- Object.add(int index, Object element)**

Print - Open in New Terminal

Wrisible Smart Insert 43:06:17PM

Q

\Rightarrow size increasing

\Rightarrow we are able to add object in arraylist
at any given index

\Rightarrow front \leftarrow (\times) not recommended

\Rightarrow middle(index) \leftarrow (\times) not recommended

\Rightarrow rear \leftarrow

$a[4] \rightarrow [11 | 22 | 33 | 44 | 11]$

except easy to add, rear end

10

\Rightarrow And adjust value based
allowing allowed.

$a[4] \rightarrow$ 
expect ready to add = rear end
but

$a[4].add(2, 28)$

11 22 28 33
0 1 2 3 4

\Rightarrow increasing by not efficient
because shifting of object to next index

Two green arrows point from the left margin of the code editor towards the video player window.

```
1  Package Explorer: X | RunnningALG.java X
2  > ArrayPrg
3  > Arrays
4  > CollectionsD
5  > CollectionFramework
6  > All System Library [new JList(7)]
7  > src (details selected)
8  > 35 (details selected)
9  > ArrayList.java
10 > ArrayList
11 > OutPut
12 > OutPut
13 > ErrOut
14 > ExceptionHandling
15 > Game
16 > Inherita
17 > LambdaExp
18 > Launch
19 > LaunchException
20 > LaunchInheritance
21 > Line Based DataTypes
22 > Methods
23 > Loops
24 > Methods
25 > MainF
26 > Operator
27 > Operators
28 > Out
29 > Out
30 > Out
31 > Out
32 > Out
33 > Out
34 > Out
35 > Out
36 > al4.add(11);
37 > al4.add(22);
38 > al4.add(33);
39 > al4.add(44);
40 > System.out.println("existing data " + al4);
41 > al4.add(2, 28);
42 > System.out.println("after adding in 2nd index "+al4);
43 > al4.add(0, 5);
44 > System.out.println("after adding in 0th index "+al4);
45 > al4.add(55);
46 > System.out.println("after adding in rear end "+al4);
47 > System.out.println(al4);
48 >
49 >
50 > System.out.println("after adding in rear end "+al4);
51 > al4.addAll(1, al2);
52 > System.out.println(al4);
53 >
54 >
55 >
56 >
57 >
```

System.out.println("*****");
System.out.println();
System.out.println("existing data " + al4);
al4.add(2, 28);
System.out.println("after adding in 2nd index "+al4);
al4.add(0, 5);
System.out.println("after adding in 0th index "+al4);
al4.add(55);
System.out.println("after adding in rear end "+al4);
al4.addAll(1, al2);
System.out.println(al4);



The screenshot shows a Java development environment with two open tabs: "Lernobligation" and "ArrayList". The "ArrayList" tab contains the following code:

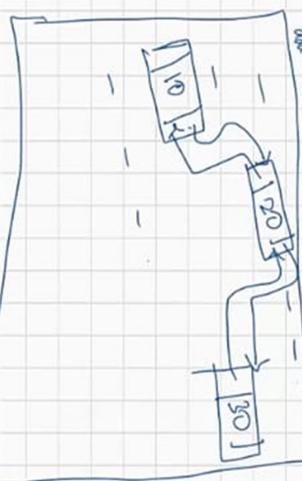
```
System.out.println("*****");
ArrayList aL4=new ArrayList();
aL4.add(11);
aL4.add(22);
aL4.add(33);
aL4.add(44);
System.out.println("existing data " + aL4);
```

The output in the console is:

```
[10, 20, 30]
[1Neuron, 28, b, 18.5]
```

A large green 'L' is drawn over the left side of the code editor. In the bottom right corner of the screen, there is a video player window showing a person's face.

13



list.add(10)
list.add(20)

=> LinkedList => (doubly Linked List DS)
↳ Homogeneous Data
↳ Heterogeneous Data
↳ stored as Object

=>

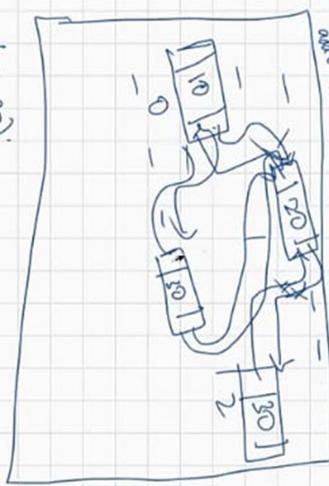
list.add(30)

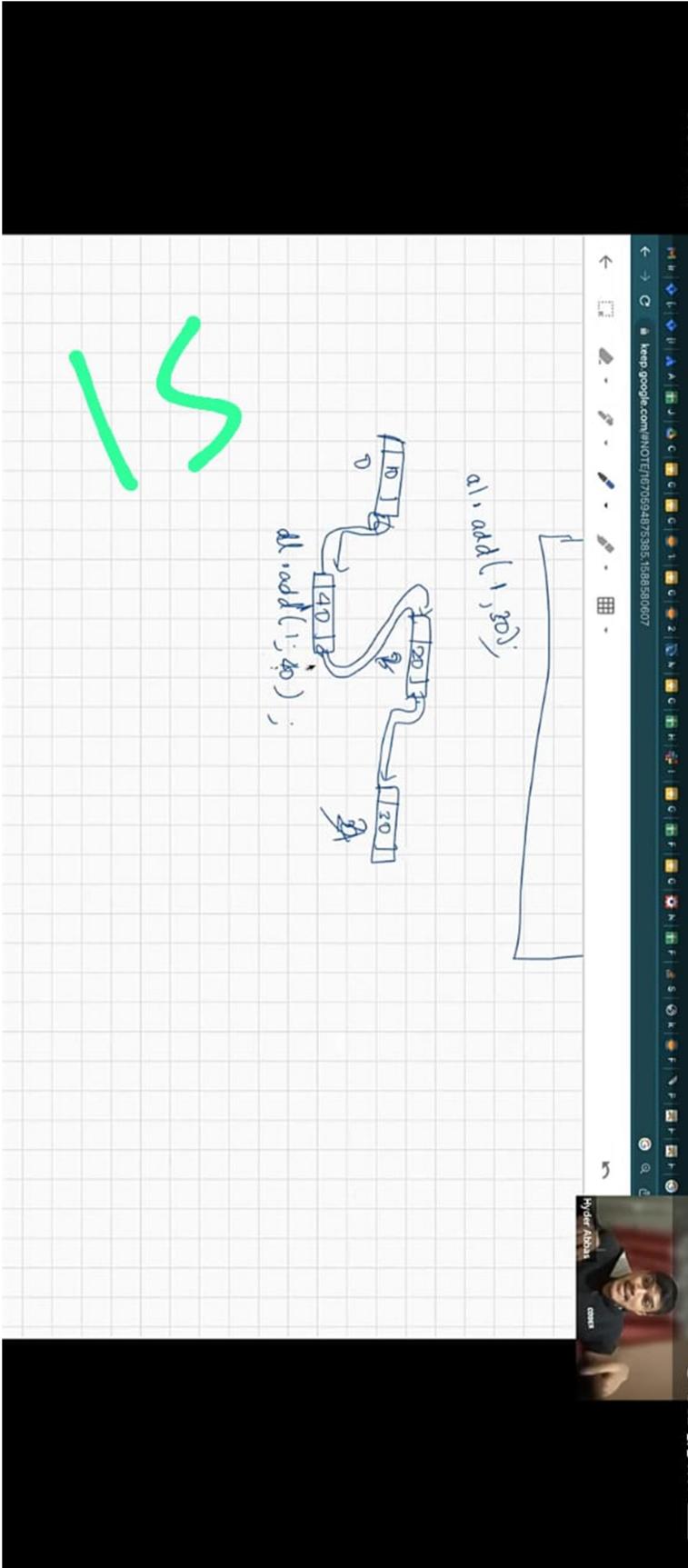
(List & Queue) & shifting of object to next node



14

a1.add(1,30)





The screenshot shows a Java development environment with a code editor and a package explorer. The code editor displays the following Java code:

```
1 import java.util.*;
2 public class LaunchLL {
3     public static void main(String[] args) {
4         // TODO Auto-generated method stub
5         LinkedList ll1=new LinkedList();
6         ll1.add("iNeuron");
7         ll1.add(20);
8         System.out.println(ll1);
9     }
10 }
```

A code completion dropdown is open at line 14, showing the suggestion `ll1.add`. The tooltip for this suggestion provides the following information:

`ll1.add`

Adds the specified element to the end of this list.
The method is equivalent to `add`.
Specified by `add` in `List`, `add` in `Collection`, `Overrides:`
`Object.add`
Parameters:
e - element to be appended to this list;
Returns:
true (as specified by `Collection.add`)

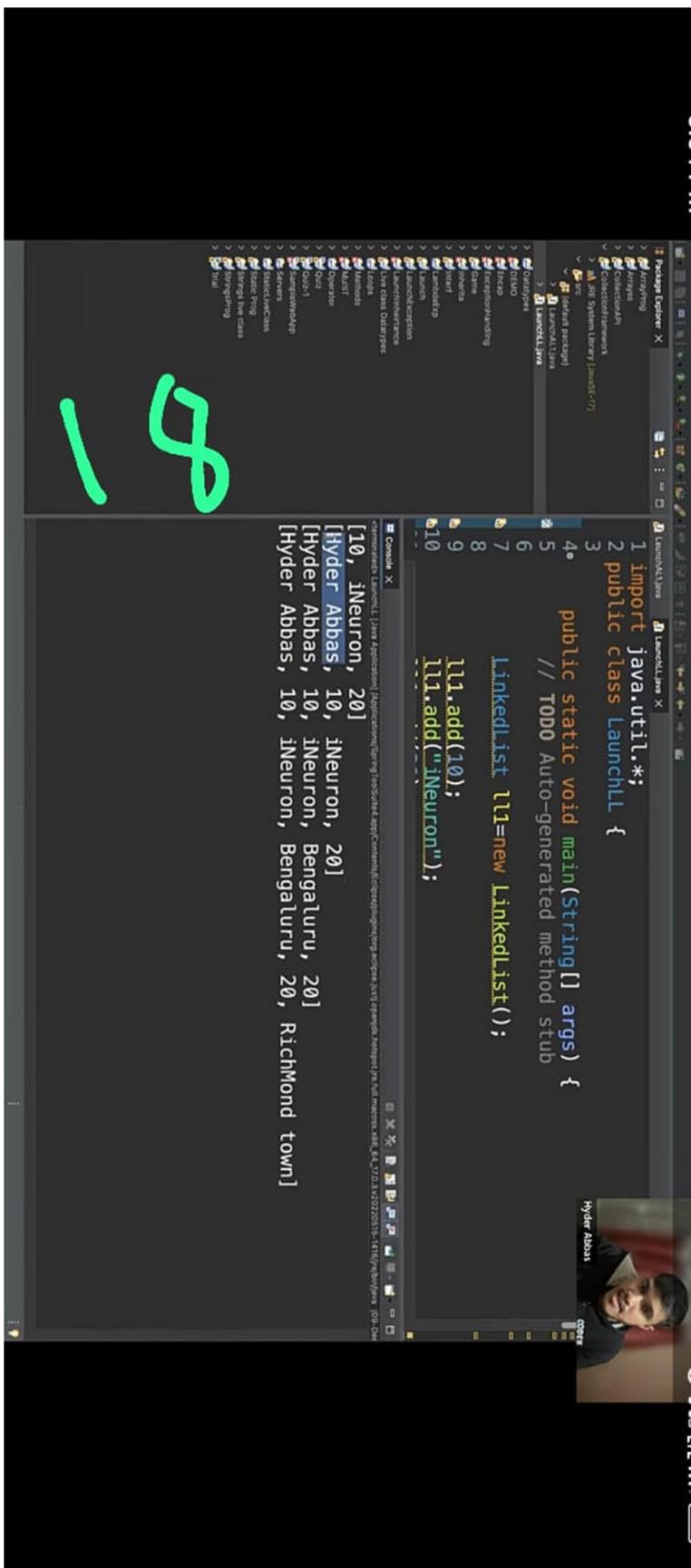
The background of the IDE shows a photo of a smiling man.

The screenshot shows a Java development environment with the following components:

- Code Editor:** Displays the following Java code:

```
1 import java.util.*;
2 public class LaunchLL {
3     public static void main(String[] args) {
4         // TODO Auto-generated method stub
5         LinkedList<String> ll1=new LinkedList();
6         ll1.add("iNeuron");
7         ll1.add("20");
8         System.out.println(ll1);
9     }
10    public static void main(String[] args) {
11        System.out.println("Hello World");
12    }
13 }
14
15
16
17
18
19
20
21
22
23
24
25
26
27 }
```

- Package Explorer:** Shows a project structure with several packages and source files.
- Terminal:** Shows the command "Hyder Abbas" and a small profile picture.
- Bottom Status Bar:** Displays "Wimble" and "Smart Insert" along with a timestamp "22:31:43".



=> After these classes is array concept gone? outdated?
But NO
when we have storing large Data

=>
ArrayList
Collection

=> when to use among our ArrayList?

dl.add(1,40);



keep.google.com/note/d/0D954B875951988560007



< > C a keep.google.com/note/d/0D954B875951988560007

Hyde Abbott

20

ArrayList → collection
↳ object
 → primitive → Object → new instance returned
 array → primitive Data | Text
 | Object

=> when to use array over ArrayList?
 ²
 = whenever => size of the data is known
 if you're sure that Data is homogeneous/similar
 then you must go with array.
=> array is faster than ArrayList



```
1 import java.util.ArrayList;
2
3 public class LaunchALIM {
4
5     public static void main(String[] args) {
6         ArrayList al4=new ArrayList();
7         al4.add(11);
8         al4.add(22);
9         al4.add(33);
10        al4.add(44);
11        System.out.println(al4);
12    }
13 }
14
15     add(Elem, Collection<?> c) {begin: ArrayList<?> c}
16     add(Elem elem) {begin: ArrayList<?> c}
17 }
```

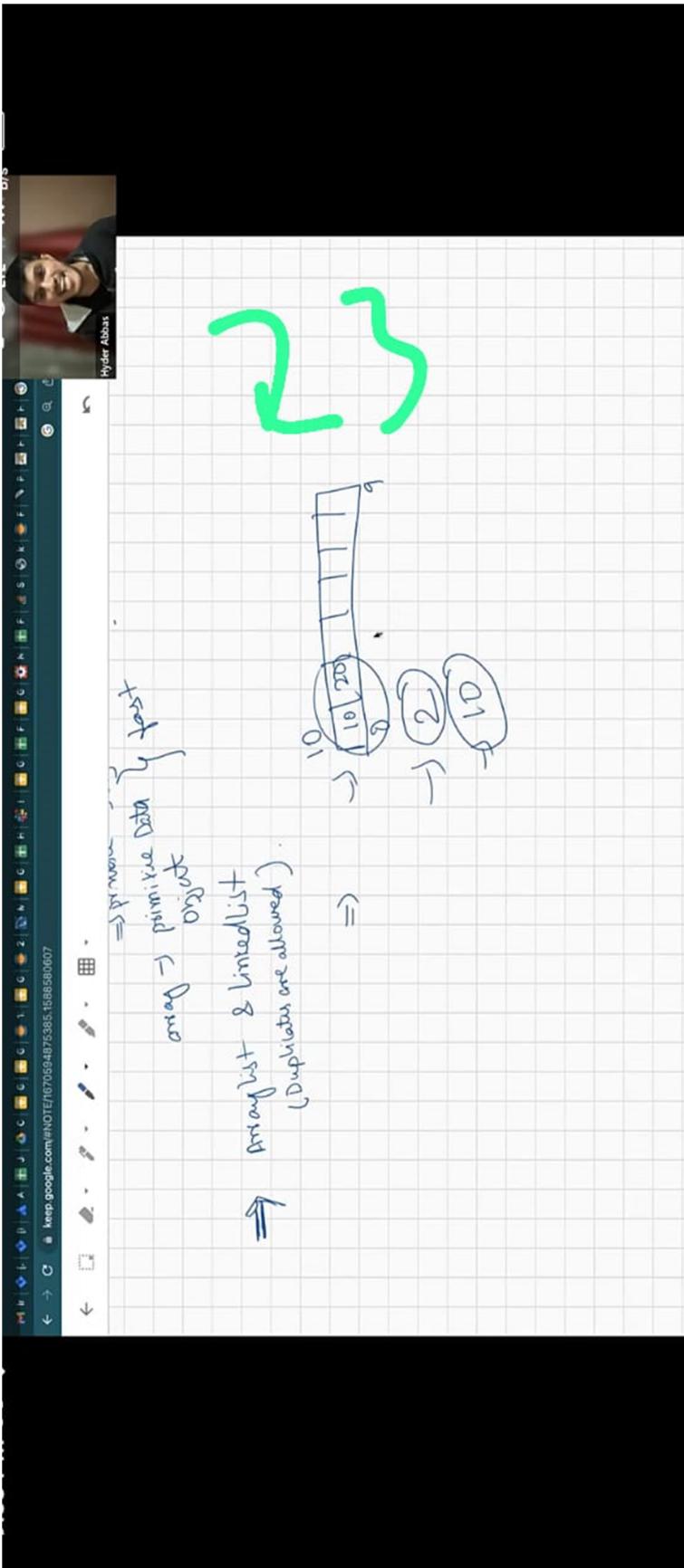
The code is a Java program named `LaunchALIM`. It imports the `ArrayList` class from the `java.util` package. The `main` method creates a new `ArrayList` object named `al4`, adds four integer elements (11, 22, 33, 44) to it, and then prints the list to the console using `System.out.println`.

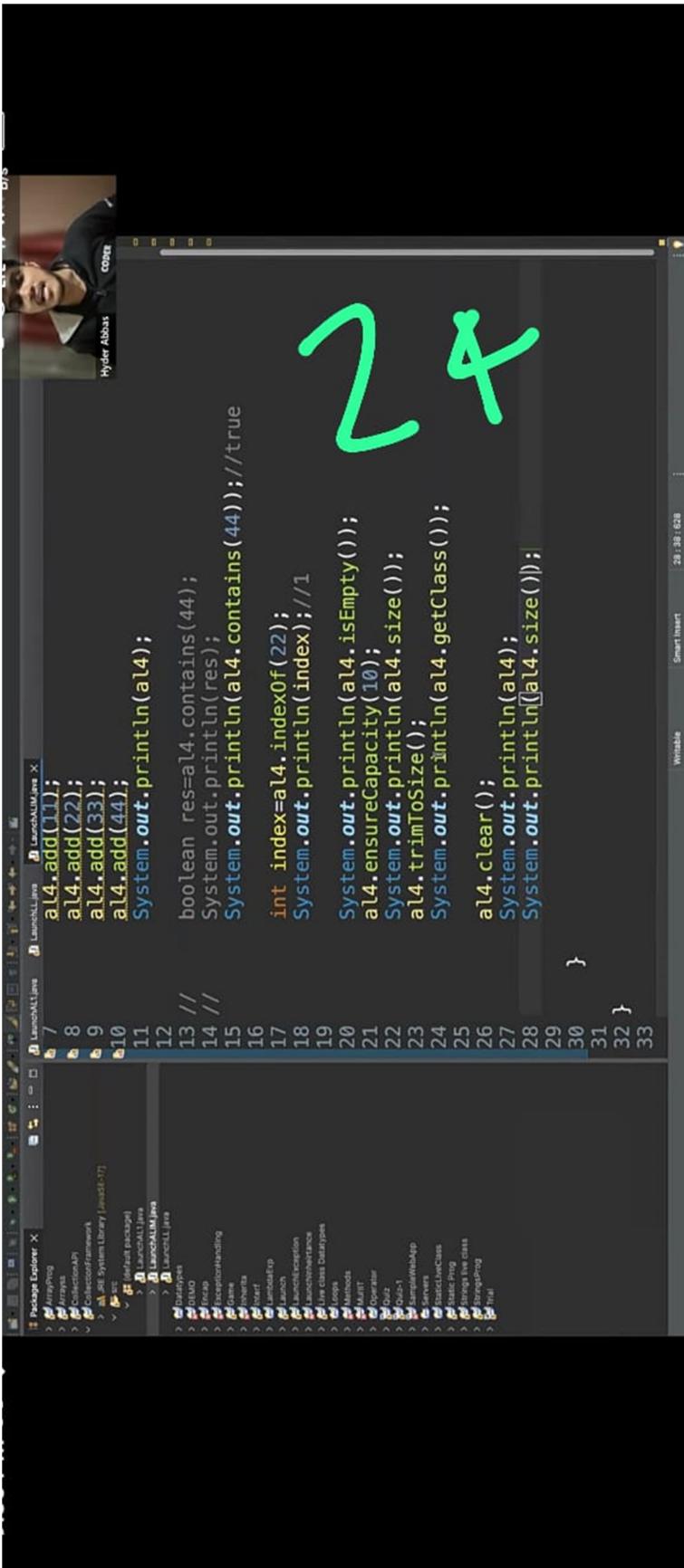
A tooltip for the `add` method is displayed at the bottom of the code editor:

`add(Elem, Collection<?> c)`

Specified by:
ArrayList: add(Elem, Collection<?> c)
Parameter:
Elem element to be appended to this list
Returns:
true (as specified by Collection.add)
For each consumer action, void
grifit(Elem elem, Object<?> elem)
grifit(Elem elem, Object<?> elem)
hashFunction: int -> Object
Three-dimensional hash function
Print what others proposed later or click for more

```
1 import java.util.ArrayList;
2
3 public class LaunchALIM {
4
5     public static void main(String[] args) {
6         ArrayList al4=new ArrayList();
7         al4.add(11);
8         al4.add(22);
9         al4.add(33);
10        al4.add(44);
11        System.out.println(al4);
12
13    //    boolean res=al4.contains(44);
14    //    System.out.println(res);
15    //    System.out.println(al4.contains(44));//true
16    int index=al4.indexOf(22);
17    System.out.println(index); //1
18
19    System.out.println(al4.isEmpty());
20    al4.ensureCapacity(10);
21    System.out.println(al4.size());
22
23 }
24
25
26 }
27
```





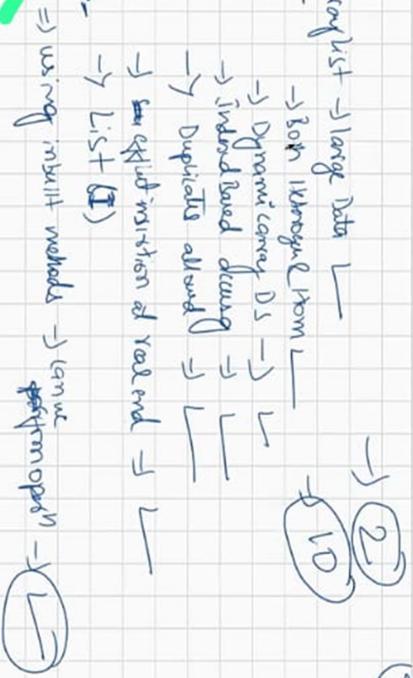
The screenshot shows a Java development environment with a code editor containing the following Java code:

```
1 package Example;
2
3 import java.util.ArrayList;
4 import java.util.List;
5
6 public class Example {
7     public static void main(String[] args) {
8         ArrayList<Integer> al4 = new ArrayList<Integer>();
9         al4.add(11);
10        al4.add(22);
11        al4.add(33);
12        al4.add(44);
13        System.out.println(al4);
14
15        boolean res=al4.contains(44);
16        System.out.println(res);
17        System.out.println(al4.contains(44)); // true
18
19        int index=al4.indexOf(22);
20        System.out.println(index); // 1
21
22        System.out.println(al4.isEmpty());
23        al4.ensureCapacity(10);
24        System.out.println(al4.size());
25        al4.trimToSize();
26        System.out.println(al4.getClass());
27
28        al4.clear();
29        System.out.println(al4);
30        System.out.println(al4.size());
31
32    }
33 }
```

A large, hand-drawn green number '24' is overlaid on the left side of the code editor area.

DS

- => Arraylist → large Data
- Both Unordered Item
- Dynamic Commt DS
- Index Based Access
- Duplicates allowed
- ~~new~~ Construction of Record
- List (I)



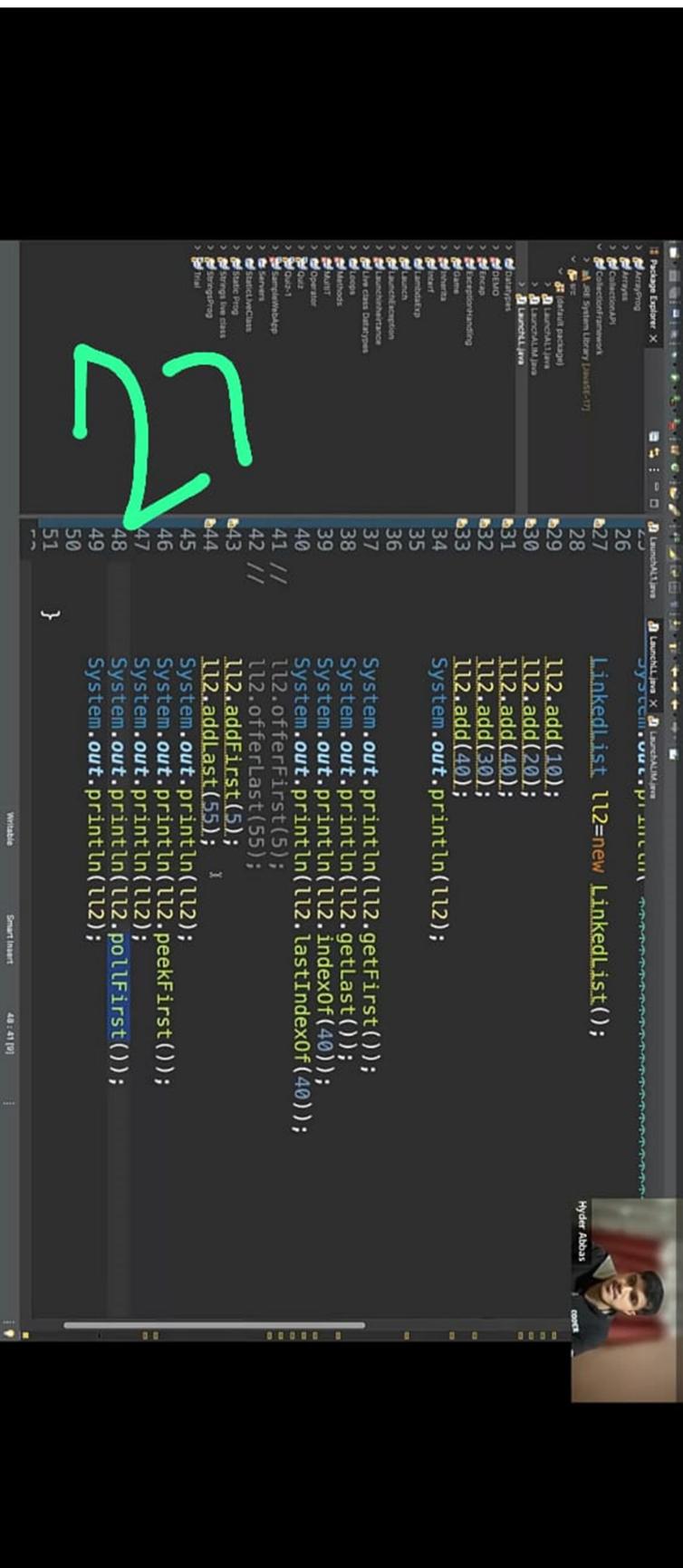
keep.google.com/note/D7D548753851989598007



5
6

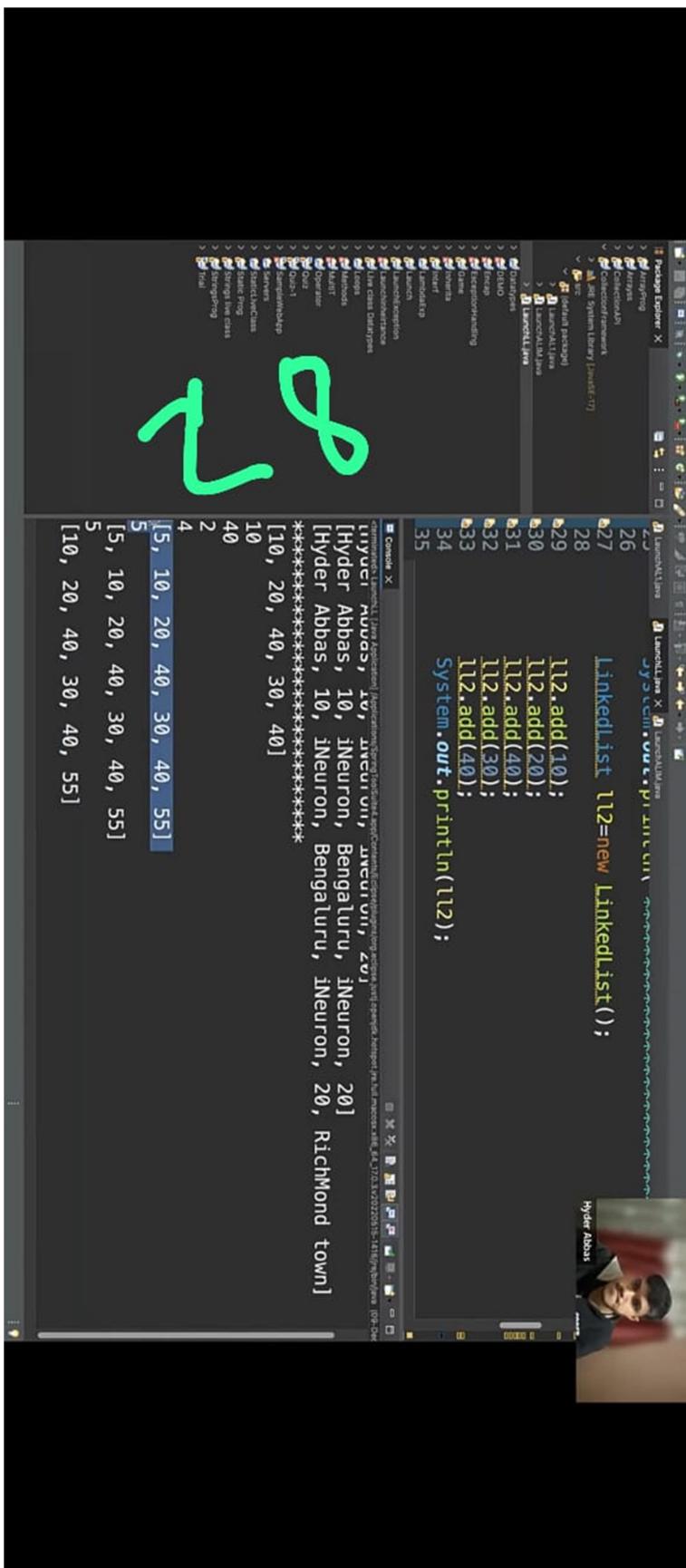
- ⇒ LinkedList → Doubly Linked List
- List Nodes linking with previous node & next node
- can program insertion at any given position →
- one collection another collection →
- store Data as object →
- `list(i)` & `dequeue(i)` →

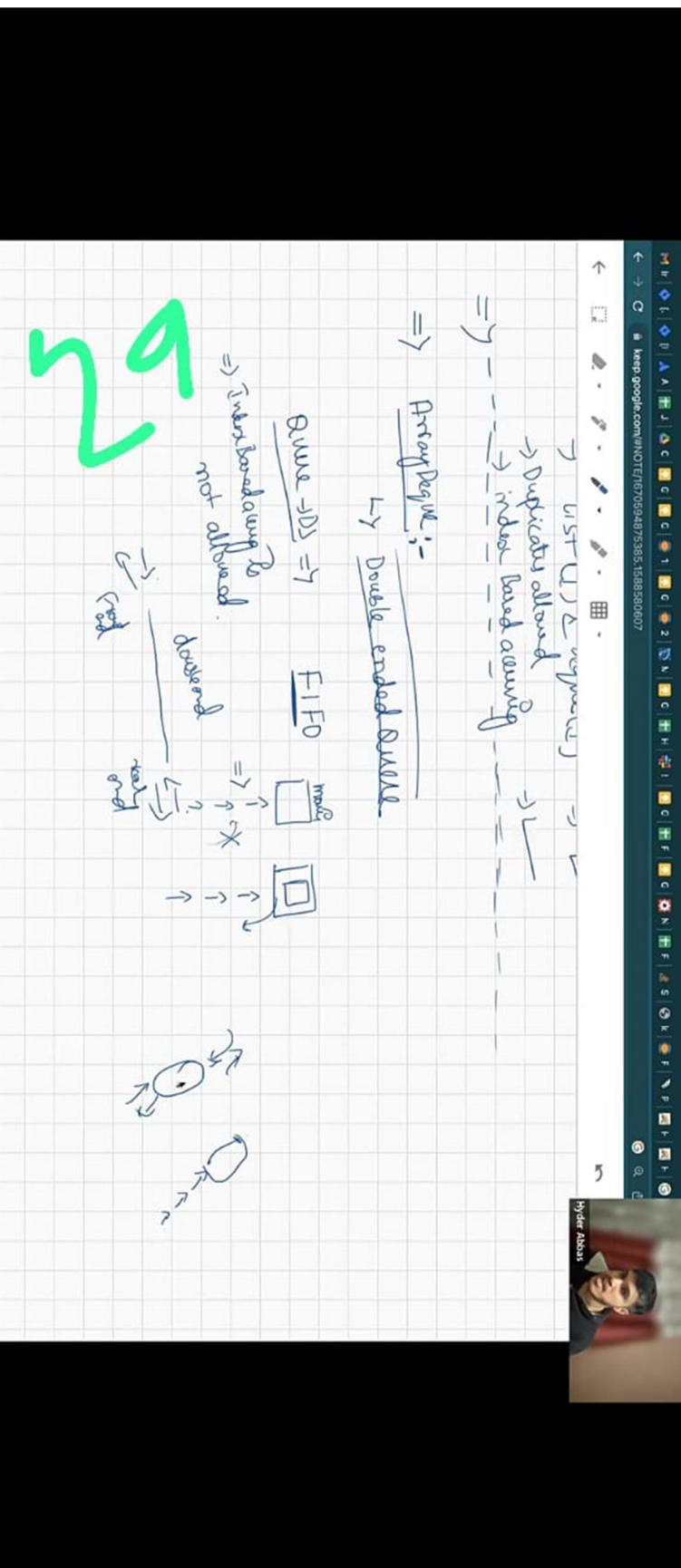




```
26
27     LinkedList ll2=new LinkedList();
28
29     ll2.add(10);
30     ll2.add(20);
31     ll2.add(40);
32     ll2.add(30);
33     ll2.add(40);
34
35     System.out.println(ll2);
36
37     System.out.println(ll2.getFirst());
38     System.out.println(ll2.getLast());
39     System.out.println(ll2.indexOf(40));
40     System.out.println(ll2.lastIndexOf(40));
41     //
42     ll2.offerFirst(55);
43     ll2.addFirst(5);
44     ll2.addLast(55);
45     System.out.println(ll2);
46     System.out.println(ll2.peekFirst());
47     System.out.println(ll2);
48     System.out.println(ll2.pollFirst());
49     System.out.println(ll2);
50
51 }
```







30

- ⇒ Array Deque → double ended Deque
 - > insertion / removal at front / rear and -
deletion
 - > duplicates allowed
 - > includes add, remove not allowed
 - > ~~dequeue (l)~~

↳ double ended Deque



Hypothese

⇒ ~~addFirst()~~, ~~addLast()~~, ⇒ 

↳ double ended Deque

~~add(int, obj);~~



4. public static void main(String[] args) {
5. z: for (int x = 2; x < 7; x++) {
6. if (x == 3)
7. continue;
8. if (x == 5)
9. break z;
10. o = o + x;
11. }
12. System.out.println(o);
13. }
14.
15.

What is the result?

A. 2
B. 24
C. 234
D. 246
E. 2346
F. Compilation fails

What is the result?

- x = 2 , 2<7!(true)
 - C. 234
 - D. 246
 - E. 2346
 - F. Compilation fails

31

File Edit View
C. 234
D. 246
E. 2346
F. Compilation fails

```
x = 2, 2<7(true)
2==3(false)
2==5(false)
o = "2"
```

```
x = 3, 3<7(true)
3==3(true)
x= 4, 4<7(true)
4==3(false)
4==5(false)
o ="24"
x= 5, 5<7(true)
5==3(false)
5==5(true)
```

Answer:B("24")

32

197C
Cloud



Ln: 32 Col: 12

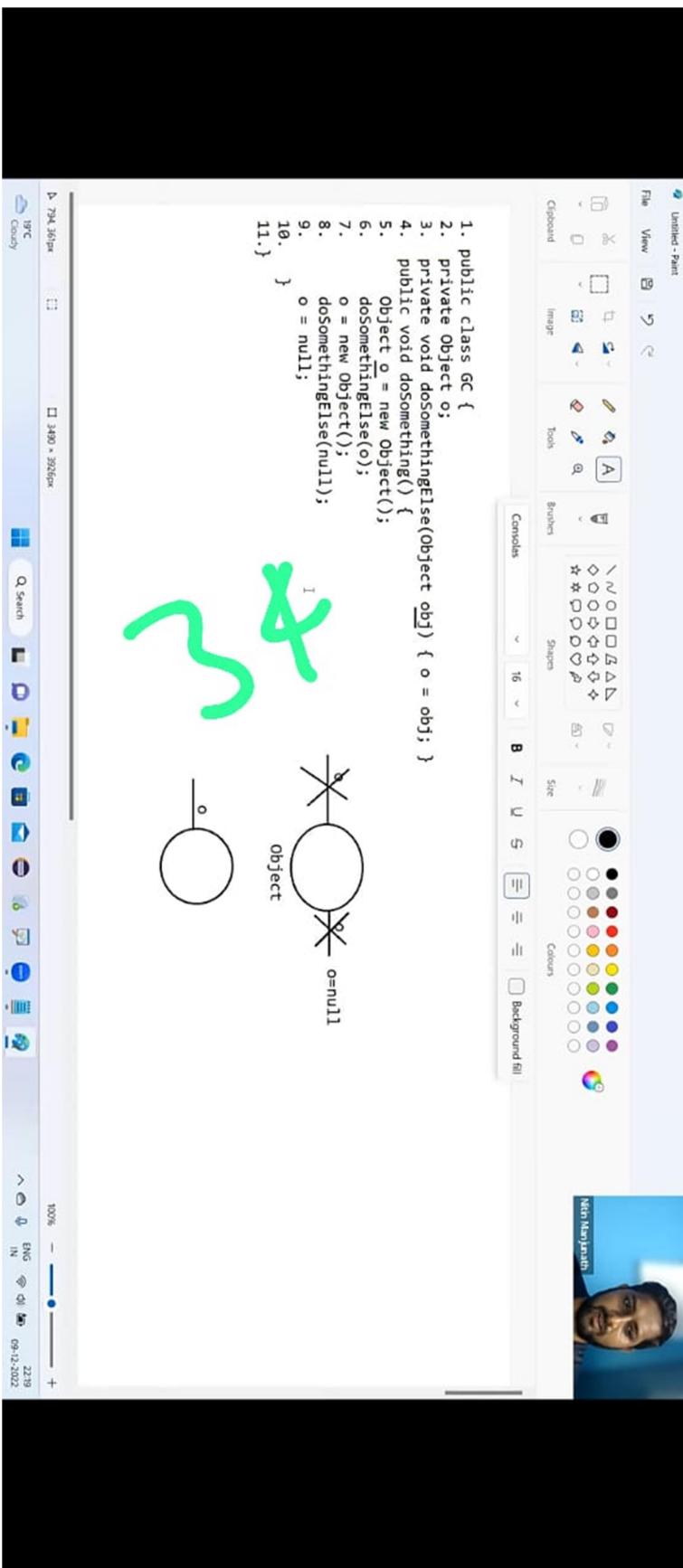
100% Windows (UTF-8) UTF-8

ENG IN 22:12 09-12-2022



```
*99-12-2022-snippet_session_notes - Notepad  
File Edit View  
Notepad  
Nitin Naipatth  
1. public class GC{  
2.     private Object o;  
3.     private void doSomethingElse(Object obj) { o = obj; }  
4.     public void doSomething(){  
5.         Object o = new Object();  
6.         doSomethingElse(o);  
7.         o = new Object();  
8.         doSomethingElse(null);  
9.         o = null;  
10.    }  
11.}  
  
When the doSomething method is called, after which line does the Object created in line 5 become available for garbage collection?  
A. Line 5  
B. Line 6  
C. Line 7  
D. Line 8  
E. Line 9  
F. Line 10  
  
Answer: D
```





1000000

9_12_2022_inspire_session_notes - NotePad

2

```
1. interface DeclareStuff{  
2.     public static final int EASY = 3;  
3.  
4.     void doStuff(int t);  
5. }  
  
6.  
7. public class TestDeclare implements Declara-  
8.     public static void main(String[] args){  
9.         int x = 5;  
10.        new TestDeclare().doStuff(++x);  
11.    }  
12.  
13.    void doStuff(int s){  
14.        s += EASY + ++s;  
15.        System.out.println("s " + s);  
16.    }  
}
```

What is the result?



100% Windows (CR/LF) UTF-8



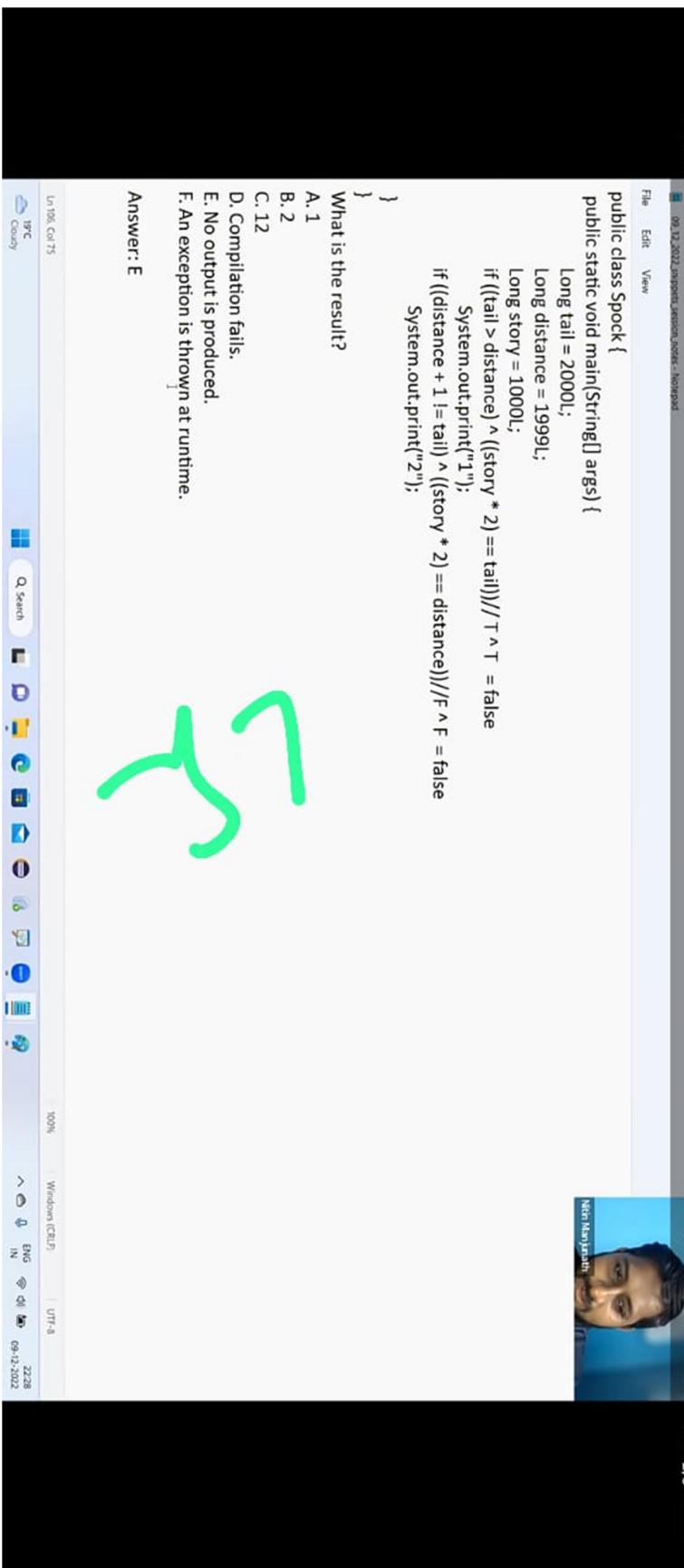
```
09-12-2022 snippets/session_notes - Notepad
File Edit View
10.     new TestDeclare().doStuff(++x);
11.
12.
13. void doStuff(int s) {
14.     s += EASY + ++s;
15.     System.out.println("s " + s);
16.
17.}
```

What is the result?

- A. s 14
- B. s 16
- C. s 10
- D. Compilation fails.
- E. An exception is thrown at runtime.

Answer: D





```
09-12-2022 Imports session-Notes - Notepad  
File Edit View  
public class Spock {  
    public static void main(String[] args) {  
        Long tail = 2000L;  
        Long distance = 1999L;  
        Long story = 1000L;  
        if ((tail > distance) & ((story * 2) == tail))// T & T = false  
            System.out.print("1");  
        if ((distance + 1 != tail) & ((story * 2) == distance))//F & F = false  
            System.out.print("2");  
    }  
}  
  
What is the result?  
A. 1  
B. 2  
C. 12  
D. Compilation fails.  
E. No output is produced.  
F. An exception is thrown at runtime.
```

Answer: E

11.42

File Edit View

Q>

```
interface DoStuff2 {
    float getRange(int low, int high);
}
interface DoMore {
    float getAvg(int a, int b, int c);
}
abstract class DoAbstract implements DoStuff2, DoMore { // line-7
    public float getRange(int x, int y) {
        return 3.14f;
    }
} //line-12

interface DoAll extends DoMore { //line-13
    float getAvg(int a, int b, int c, int d);
}
```

What is the result?

A. The file will compile without error.

11.42

File Edit View

Q>

```
interface DoStuff2 {
    float getRange(int low, int high);
}
interface DoMore {
    float getAvg(int a, int b, int c);
}
abstract class DoAbstract implements DoStuff2, DoMore { // line-7
    public float getRange(int x, int y) {
        return 3.14f;
    }
} //line-12

interface DoAll extends DoMore { //line-13
    float getAvg(int a, int b, int c, int d);
}
```

What is the result?

A. The file will compile without error.

```
File Edit View
class DoStuff implements DoStuff2 {
    public float getRange(int x, int y) {
        return 3.14f;
    }
}

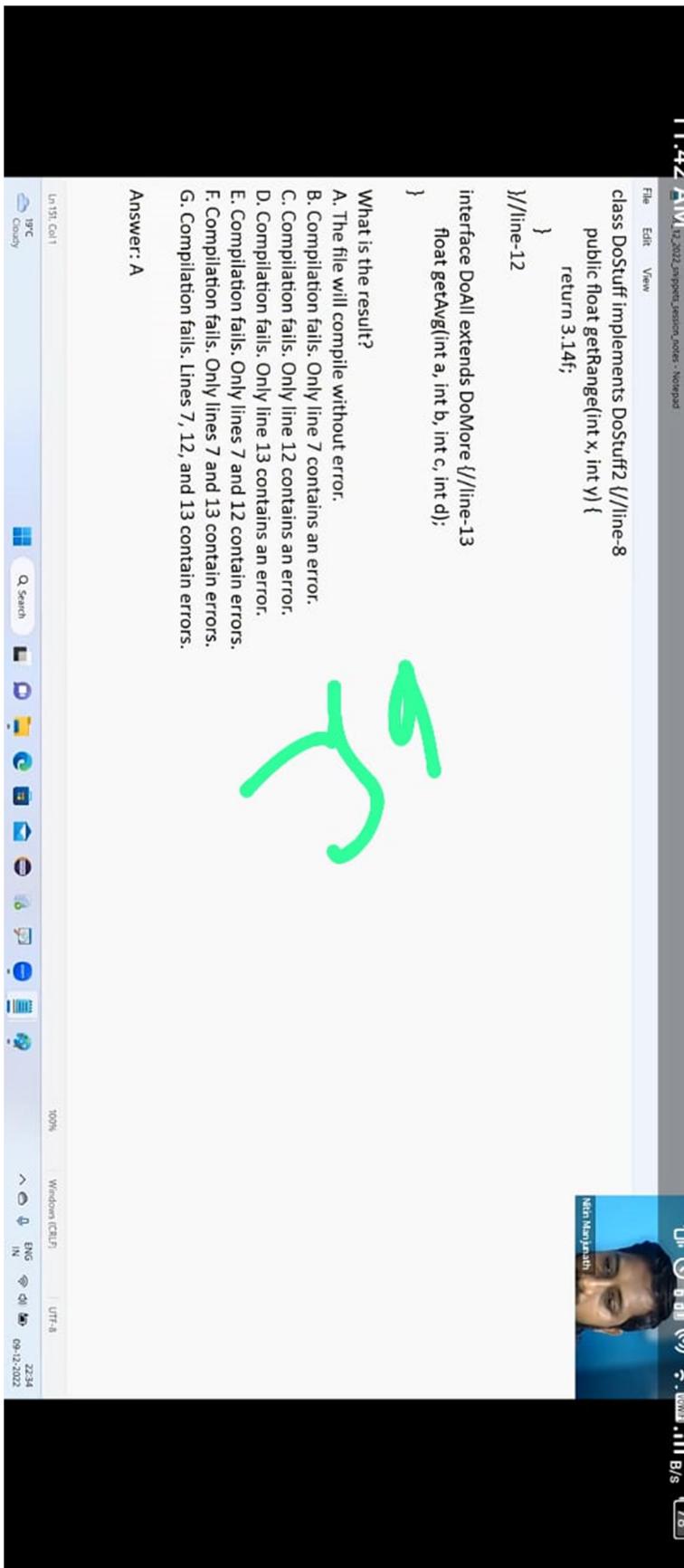
interface DoAll extends DoMore {
    float getAvg(int a, int b, int c, int d);
}

What is the result?
A. The file will compile without error.
B. Compilation fails. Only line 7 contains an error.
C. Compilation fails. Only line 12 contains an error.
D. Compilation fails. Only line 13 contains an error.
E. Compilation fails. Only lines 7 and 12 contain errors.
F. Compilation fails. Only lines 7 and 13 contain errors.
G. Compilation fails. Lines 7, 12, and 13 contain errors.
```

What is the result?

- B. Compilation fails. Only line 7 contains an error.
 - C. Compilation fails. Only line 12 contains an error.
 - D. Compilation fails. Only line 13 contains an error.
 - E. Compilation fails. Only lines 7 and 12 contain errors.
 - F. Compilation fails. Only lines 7 and 13 contain errors.
 - G. Compilation fails. Lines 7, 12, and 13 contain errors.

Answer: A



09-12-2022 snippets-session-notes - Notepad

File Edit View

```
class TestException extends Exception { //Exception => Partially checked Exception
public TestException() {
    super();
}

public TestException(String s) {
    super(s);
}

public class Test{
    public void m1() throws _____ {
        throw new TestException();
    }
}
```

For the above code, fill in the blank with one option.

- A. Exception
- B. Object
- C. RunTimeException
- D. Error

Answer: A

40



Nitin Nareshna

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File Edit View
D. Error

2.
public class Test {
 private static int [] arr; // arr =null
 public static void main(String [] args) {
 if(arr.length > 0 && arr[0] != null){
 System.out.println(arr[0]);
 }
 }
}

Predict Output, if the above code is run with given command?
java Test

- A. CompilationError
- B. No Output is produced
- C. NullPointerException is thrown at runtime
- D. ArrayIndexOutOfBoundsException is thrown at runtime

Answer: B

41

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42

```
09-12-2022 snippets-session-notes - Notepad  
File Edit View  
abstract class Super{  
    public abstract void m1() throws IOException;  
}  
class Sub extends Super{  
    @Override  
    public void m1() throws IOException{  
        throw new FileNotFoundException();  
    }  
}  
public class Test{  
    public static void main(String[] args){  
        Super s = new Sub();  
        try{  
            s.m1();  
        } catch (IOException e){  
            System.out.print("A");  
        } catch(FileNotFoundException e){  
            System.out.print("B");  
        } finally{  
            System.out.print("C");  
        }  
    }  
}
```

Nitin Manjrekar

```
public class Test {
    public static void main(String[] args) {
        Super s = new Sub();
        try {
            s.m1();
        } catch (IOException e) {
            System.out.print("A");
        } catch (FileNotFoundException e) {
            System.out.print("B");
        } finally {
            System.out.print("C");
        }
    }
}
```

C. class sub gives compilation error
D. class Test gives compilation error

Answer: D

43