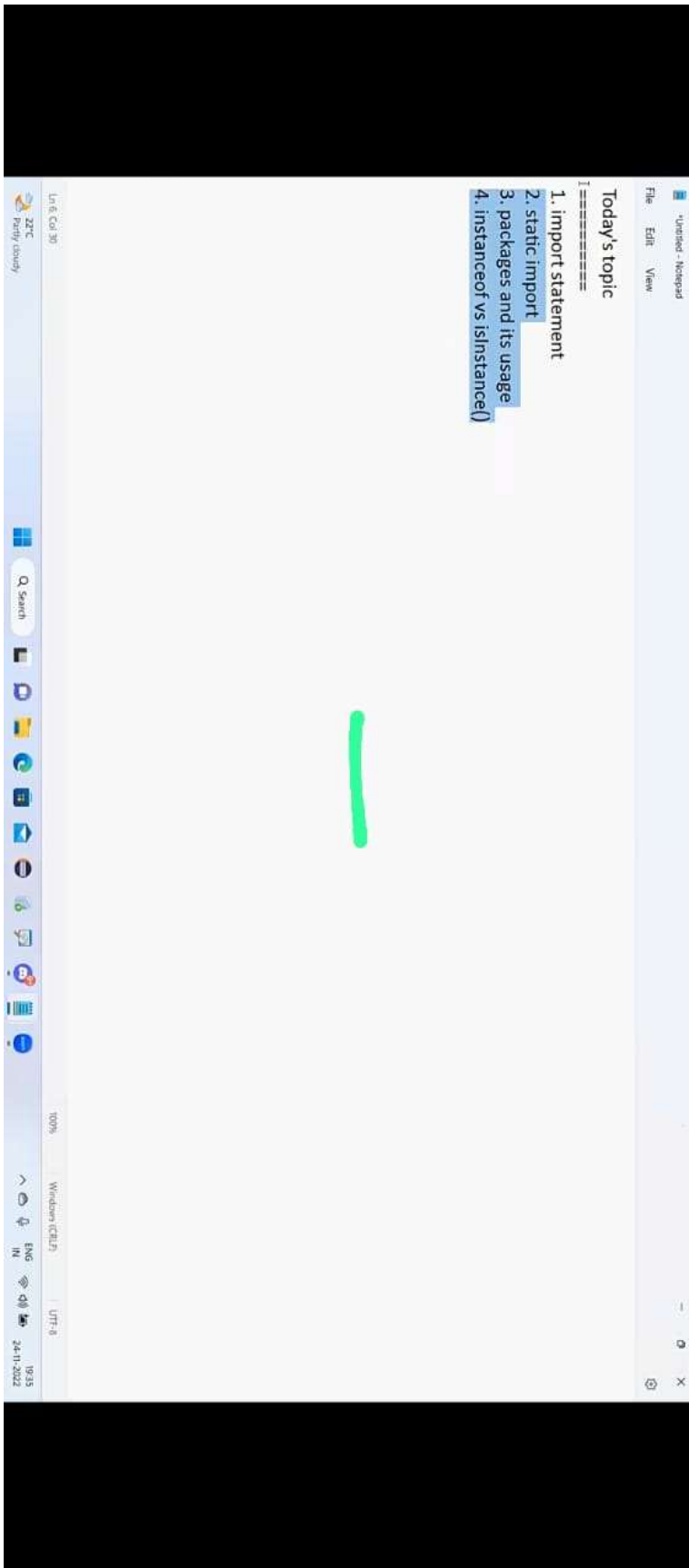


Java Import Statement Functional Interface Lamda Expression



Editor - (D:\Wrapper class\Test.java)

File Edit View Search Document Project Tools Browser Emmet Window Help

Directory Object Functions

D:\ New Volume

Wrapper class

```
14
15
16
17
18
19
20
21
22
23
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29
30
31
32
33
34

1      1
2      2
3      3
4      4
5      5
6      6
7      7

System.out.println("Test.class file is loading by jvm");

public static void main(String[] args) throws Exception{

    Student student= new Student();
    java.util.ArrayList a1 = new java.util.ArrayList();//fully qualified path

}

}

/*
javac => search for the required class information in
a. cwd
b. Did the programmer specified where the class is available
*/
```

Test.java

Test.java

for help, press F1

22°C

Search

ln 20 col 82 36 00 PC ANSI

ENG IN

24-11-2022

19:47

24-11-2022

Nar Narayan



```
public static void main(String args[]){  
    ArrayList l=new ArrayList();  
}  
}
```

Output:

Compile time error.

D:\Java>javac Test.java

Test.java:3: cannot find symbol

symbol : class ArrayList

location: class Test

ArrayList l=new ArrayList();



=> We can resolve this problem by using fully qualified name "java.util.ArrayList"

l=new java.util.ArrayList();". But problem with using fully qualified name every time is it increases length of the code and reduces readability.

=> We can resolve this problem by using import statements.

Example:

import java.util.ArrayList;

class Test{

public static void main(String args[]){

ArrayList l=new ArrayList();



=> We can resolve this problem by using fully qualified name "java.util.ArrayList"
l=new java.util.ArrayList();". But problem with using fully qualified name every time is it increases length of the code
reduces readability.
=> We can resolve this problem by using import statements.

Example:

```
import java.util.ArrayList;  
class Test{  
    public static void main(String args[]){  
        ArrayList l=new ArrayList();  
    }  
}
```

Output:

D:\Java>javac Test.java

Hence whenever we are using import statement it is not require to use fully qualified names we can use short names directly.
This approach decreases length of the code and improves readability.

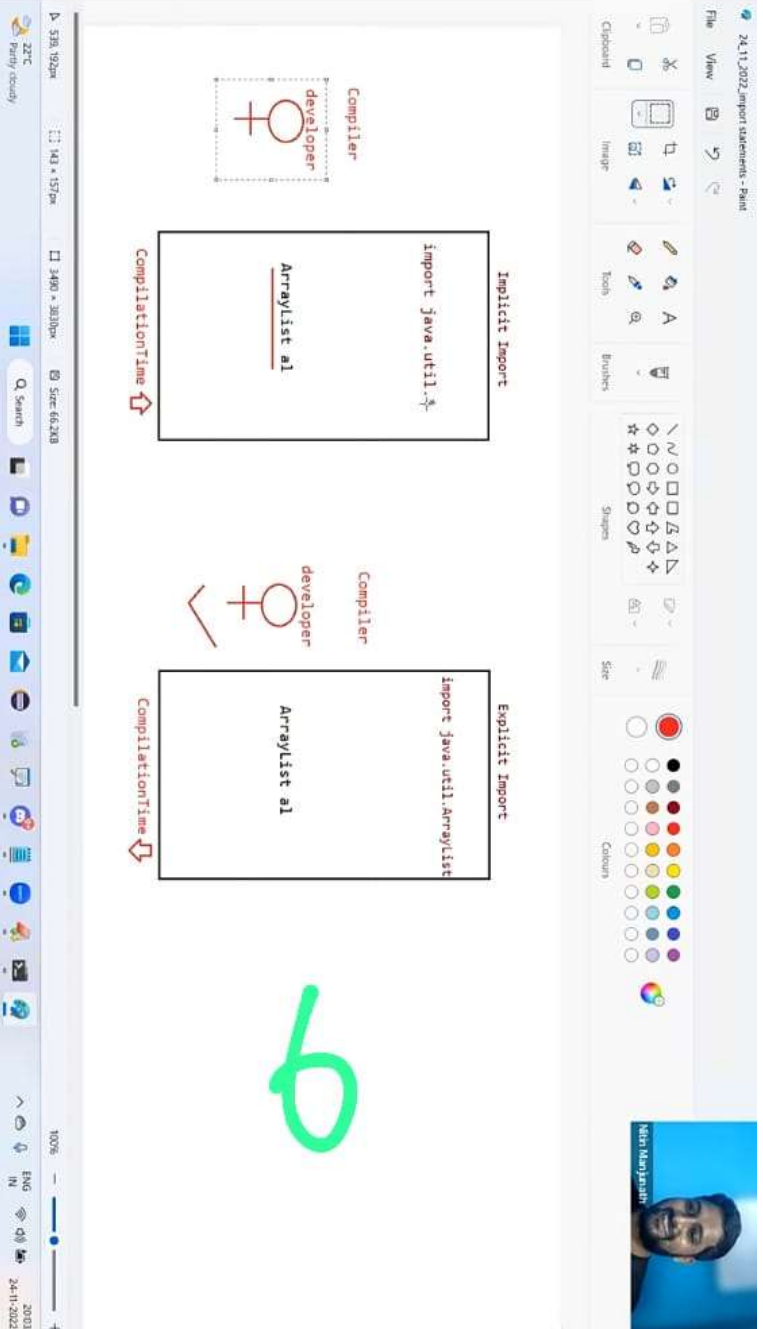
Case 1: Types of Import Statements:

There are 2 types of import statements.

- 1) Explicit class import
- 2) Implicit class import.

Ln 27 Col 5





There are 2 types of import statements.

- 1) Explicit class import
- 2) Implicit class import.

Explicit class import:

Example: `import java.util.ArrayList;`

=> This type of import is highly recommended to use because it improves readability of the code.

=> Best suitable for developers where readability is important.

Implicit class import:

Example: `import java.util.*;`

=> It is never recommended to use because it reduces readability of the code.

=> Best suitable for students where typing is important.

1

L



- a. import java.util;
- b. import java.util.ArrayList.*;
- c. import java.util.*;
- d. import java.util.ArrayList;

Answer: c and d

Case3:

consider the following code.

```
import java.util.ArrayList;
class MyArrayList extends java.util.ArrayList
{
}
```



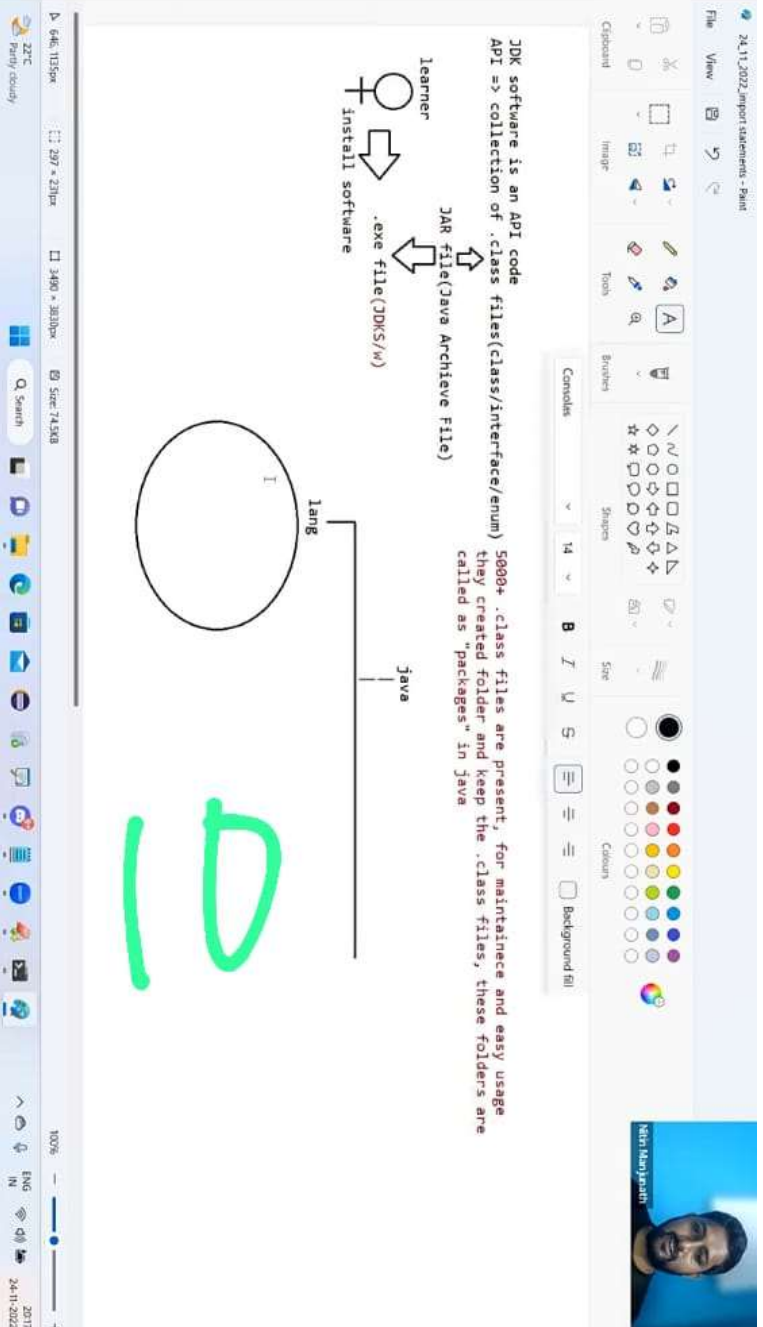
Case3:
consider the following code.

```
class MyArrayList extends java.util.ArrayList  
{  
  
}
```

=> The code compiles fine even though we are not using import statements because we used fully qualified name.
=> Whenever we are using fully qualified name it is not required to use import statement.
Similarly whenever we are using import statements it is not required to use fully qualified name.

1





24.11.2022 import statements - Print

File View

File(Java Archive File)

File(JDKS/W)

Copy Paste Image Tools

12 B I U S

Background fill

Console

12

B I U S

Background fill

Shapes

Size

Colors

lang

String
System
System
StringBuilder
StringBuffer
Exception
Thread
; ; ; ;

util

Scanner
Collection
ArrayList
LinkedList
Date
; ; ; ;

sql

Driver
Connection
Statement
PreparedStatement
Date
; ; ; ;

io

File
FileWriter
FileReader
BufferedReader
BufferedWriter
; ; ; ;

InputOutputOperation

No need to inform compiler and jvm about these classes through Import

24.11.2022

20:26

24-11-2022

Cases:

While resolving class names compiler will always gives the importance in the following order.

1. Explicit class import
2. Classes present in current working directory.
3. Implicit class import.

Example:

```
import java.util.Date;  
import java.sql.*;  
class Test {  
    public static void main(String args[]) {  
        Date d=new Date();  
    }  
}
```

The code compiles fine and in this case util package Date will be considered.

12



Editor - (D:\Wrapper\classes\Test.java 1)

File Edit View Search Document Project Tools Browser Emmet Window Help

D:\New Volume

Directory Object Functions

D:\

Wrapper\classes

1

7 = {
8 =
9
10
11
12 =
13
14
15
16 }
17 = /*
18 =
19 =
20
21 =
22
23
24 */
25
26
27
28

Test.java

```
static{  
    system.out.println("Test.class file is loading by jvm");  
}  
  
public static void main(String[] args)throws Exception{  
    Date d = new Date();  
}  
  
}  
  
java  
    | => util  
    | => Scanner.class,ArrayList.class,list.class,...  
    | => regex  
    | => Pattern.class
```

13

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PC

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IN

24-11-2022

Nitin Marjaini

Case 6:

Whenever we are importing a package all classes and interfaces present in that package are by default available but not sub package classes.

```
java  
|=> util  
|=> Scanner, class, ArrayList, class, LinkedList, class  
|=> regex  
|=> Pattern, class
```

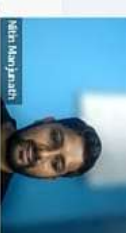
To use Pattern class in our Program directly which import statement is required ?

- a. import java.*;
- b. import java.util.*;
- c. import java.util.regex.*; //valid(implicit import)
- d. import java.util.regex.Pattern; //valid(explicit import)

Note:

* => it refers to only .class files not subpackages .class files

4



Case 7:

In any java Program the following 2 packages are not require to import because these are available by default to every java Program.

1. java.lang package
2. default package(current working directory)

c => #include<stdio.h>

java => import java.lang.*;

NS





File

View

Tools

Brokers

Shapes

Size

Colors

Clipboard

Image

Tools

Brokers

Shapes

Size

Colors

14

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Background fill

Console

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Background fill

C/C++

compiler

static inclusion

#include<stdio.h>

3000+ functions are available

compiler will bring all 3000+ function to our code

memory is wastage

Java

Java compiler

import java.lang.*;

300+ classes

System class

String

StringBuilder

StringBuffer

Dynamic Inclusion

memory is effectively utilised

16

1072 1031px

1440 x 300px

Src: WEA3

2024

24-11-2022

Case 8:

"Import statement is totally compile time concept" if more no of imports are there then more will be the compile time but there is "no change in execution time".

Difference between C language #include and java language import ?

#include

=====

1. It can be used in C & C++
 2. At compile time only compiler copy the code from standard library and placed in current program.
 3. It is static inclusion
 4. wastage of memory
- Ex : <jsp:@ file="">

import

=====

1. It can be used in Java
2. At runtime JVM will execute the corresponding standard library and use it's result in current program.
3. It is dynamic inclusion
4. No wastage of memory



4. No wastage of memory

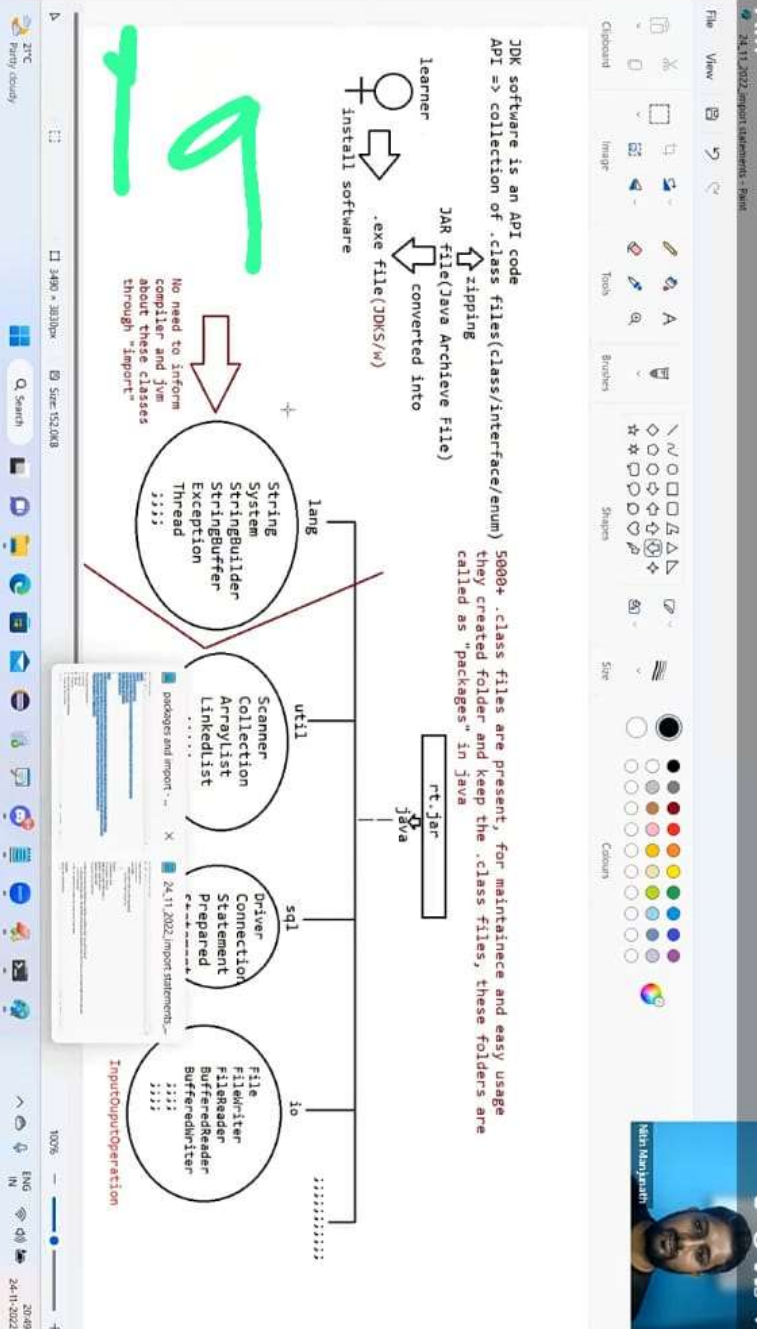
Ex : `<jsp:include >`

Note:

In the case of C language `#include` all the header files will be loaded at the time of include statement hence it follows static loading. But in java import statement no ".class" will be loaded at the time of import statements in the next lines of the code whenever we are using a particular class then only corresponding ".class" file will be loaded. Hence it follows "dynamic loading" or "load-on-demand" or "load-on-fly".

18





JDK 1.5 versions new features :

1. For-Each
2. Var-arg
3. Queue
4. Generics
5. Auto boxing and Auto unboxing
6. Co-varient return types
7. Annotations
8. Enum
9. Static import
10. String builder

20



File Edit View Search Document Project Tools Browser Window Help

D:\New Volume

Directory Content Functions

DS

Wrapper class

Test.java

1 2 3 4 5 6 7

```
1 //  
2 //normal import where * refers to .class files  
3 import java.lang.*;  
4 */  
5 import static java.lang.Math.sqrt;  
6 import static java.lang.Math.random;  
7 import static java.lang.Math.max;  
8  
9 public class Test  
10 {  
11     static {  
12         System.out.println("Test.class file is loading by jvm");  
13     }  
14  
15     public static void main(String[] args) throws Exception {  
16         System.out.println(sqrt(5));  
17         System.out.println(max(10,20));  
18         System.out.println(random());  
19     }  
20  
21  
22 }
```

Test.java

Java (JDK)

Test.java

For Help, press F1

27°C

Partly cloudy

Q Search

ln 10

cod 2

28

00

PC

ANSI

ENG

IN

24-11-2022

20:57

24-11-2022

Video call window with participant name Nishu Manjrasani

Command Prompt

X + v

```
D:\Wrapper\classes>javac Test.java
D:\Wrapper\classes>java Test
Test.class file is loading by jvm
2.2366797749979
20
0.8837454798603263
D:\Wrapper\classes>
```

72



27°C
Partly cloudy

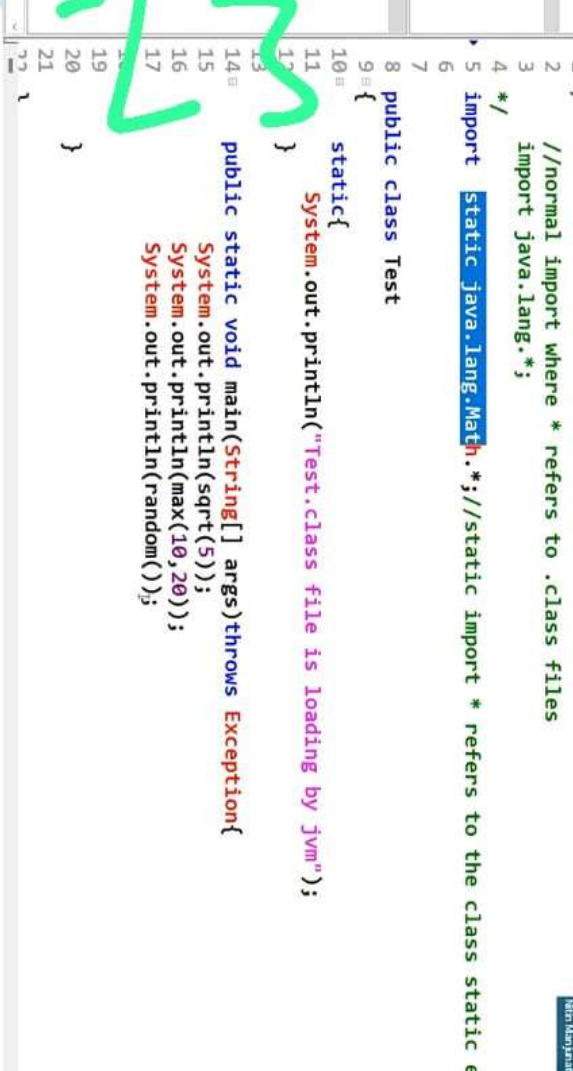
Search



ENG
IN



20:57
24-11-2022



```
1 = /*
2 //normal import where * refers to .class files
3 import java.lang.*;
4 */
5 import static java.lang.Math.*; //static import * refers to the class static elements
6
7
8 public class Test
9 {
10     static{
11         System.out.println("Test.class file is loading by jvm");
12     }
13
14     public static void main(String[] args) throws Exception{
15         System.out.println(sqrt(5));
16         System.out.println(max(10,20));
17         System.out.println(random());
18     }
19
20
21 }
```

```
24_11_2022_import statements_class_notes - Notepad
File Edit View
class Test{
    static String name = "sachin";
}

output
=====
Test.name.length() ==> 6

import java.io.PrintStream;
class System{
    static PrintStream out;
}

class PrintStream{
    public void println(){
        .....
    }
}

System.out.println()
```

24



12:04

24-11-2022, import statement, class, notes - Notepad

File Edit View

```
import java.io.PrintStream;  
class System{  
    static PrintStream out;  
}
```

```
class PrintStream{  
    public void println(){  
        .....  
    }  
}
```

System.out.println()

| | | => It is a method of PrintStream class
| | | |
| | | | => It is a reference of PrintStream Class
| | | | => it is an class

25



Ln 237, Col 22

27°C
Partly cloudy

Search



File Edit View

| | | => It is a method of PrintStream class
| | |
| | | => It is a reference of PrintStream Class
| => it is an class

Example 3:

```
import static java.lang.System.out;  
class Test{  
    public static void main(String args[]){  
        out.println("hello");  
        out.println("hi");  
    }  
}
```

Output:

D:\Java>javac Test.java

D:\Java>java Test

hello

hi

26



Ln 235, Col 1

27°C
Partly cloudy

Q Search



100%

Windows (CTRL)

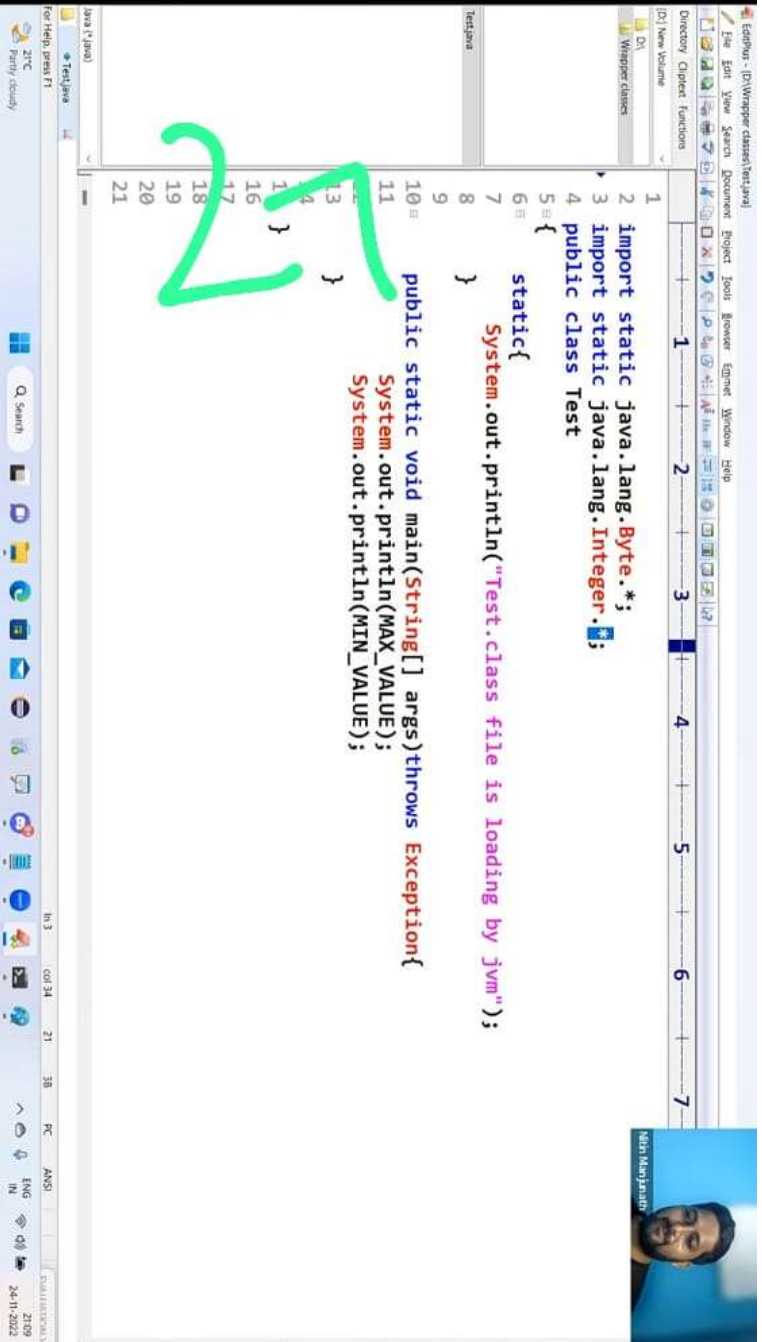
| UTF-8

ENG

IN

24-11-2022

21:07



both variable MAX_VALUE in java.lang.Integer and variable MAX_VALUE in java.lang.Byte match
System.out.println(MAX_VALUE);

Note:

Two packages contain a class or interface with the same is very rare hence ambiguity problem is very rare in normal import.
But 2 classes or interfaces can contain a method or variable with the same name is very common hence ambiguity problem is also very common in static import.

1

While resolving static members compiler will give the precedence in the following order.

1. Current class static member
2. Explicit static import
3. implicit static import

eg:

```
import static java.lang.Integer.MAX_VALUE;  
import static java.lang.Byte.*;  
class Test{  
    static int MAX_VALUE = 999;  
    public static void main(String[] args){  
        System.out.println(MAX_VALUE);  
    }  
}
```

28



File Edit View

```
import static java.lang.Byte.*;
class Test{
    static int MAX_VALUE = 999;
    public static void main(String[] args){
        System.out.println(MAX_VALUE);
    }
}
```

Which of the following import statement is valid?

```
import java.lang.Math.*;//invalid
import static java.lang.Math.*;//valid
import java.lang.Math;//valid
import static java.lang.Math;//invalid
import static java.lang.Math.sqrt.*;//invalid
import java.lang.Math.sqrt;//invalid
import static java.lang.Math.sqrt();//invalid
import static java.lang.Math.sqrt;//valid
```

79

Usage of static import reduces readability and creates confusion hence if there is no specific requirement never recommended to use static import

What is the difference between general import and static import ?

Ln 256, Col 43



```
24_11_2022_import statements_class_notes - Notepad
File Edit View
import static java.lang.Math.sqrt();//invalid
import static java.lang.Math.sqrt();//valid
```

Usage of static import reduces readability and creates confusion hence if there is no specific requirement never recommended to use static import.

What is the difference between general import and static import ?

normal import

=====

=> We can use normal imports to import classes and interfaces of a package.

=> whenever we are using normal import we can access class and interfaces directly by their short name it is not require to use fully qualified names.

static import

=====

=> We can use static import to import static members of a particular class.

=> whenever we are using static import it is not require to use class name we can access static members directly.

30





Hyder Abbas

absolut

Penjualan

31

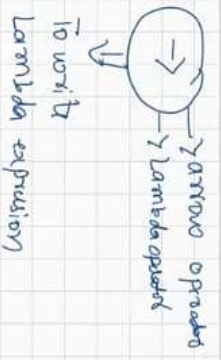


void disp(l), pretty
s.o.p("Hello"); } body

=>

() -> {

s.o.p("Hello");
}



32



① we
→

② 2 parts

↳ left of lambda operator parameters
↳ right of lambda operator body

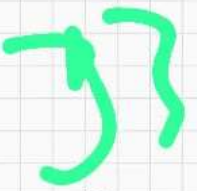
void dupl()
{
s.o.pluck();
}



() -> {

s.o.pluck();
}

+

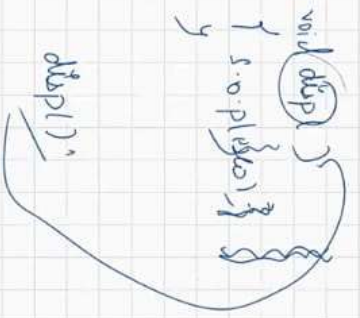


() -> s.o.pluck();



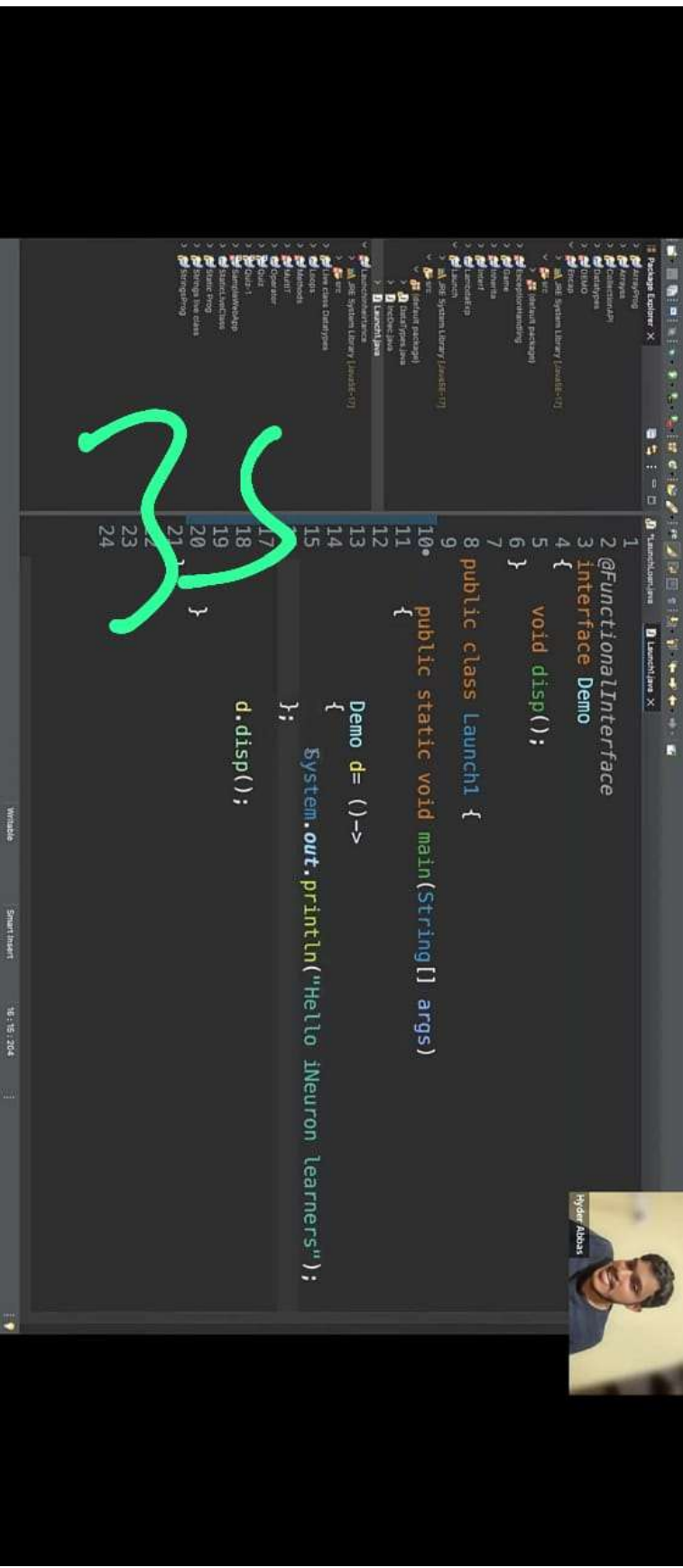


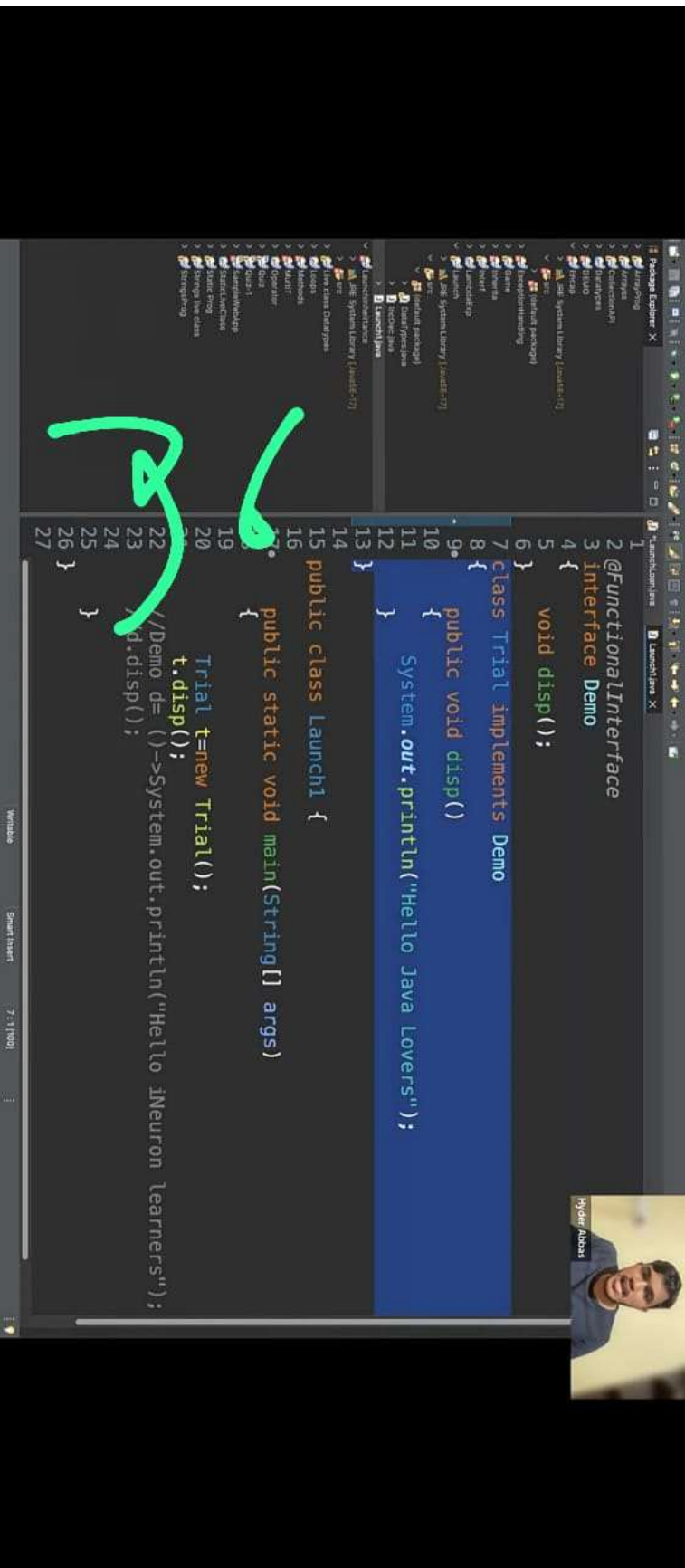
↳ sig of lambda operator body

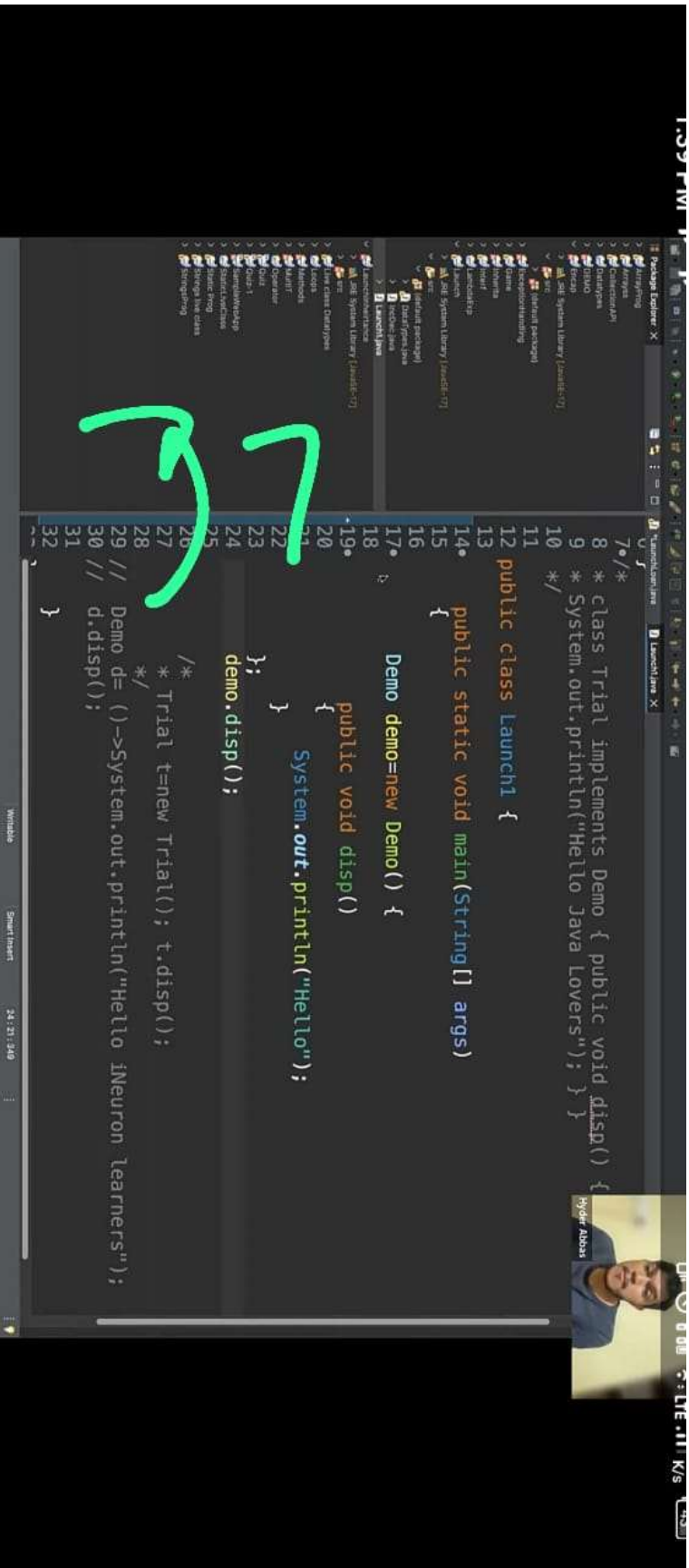


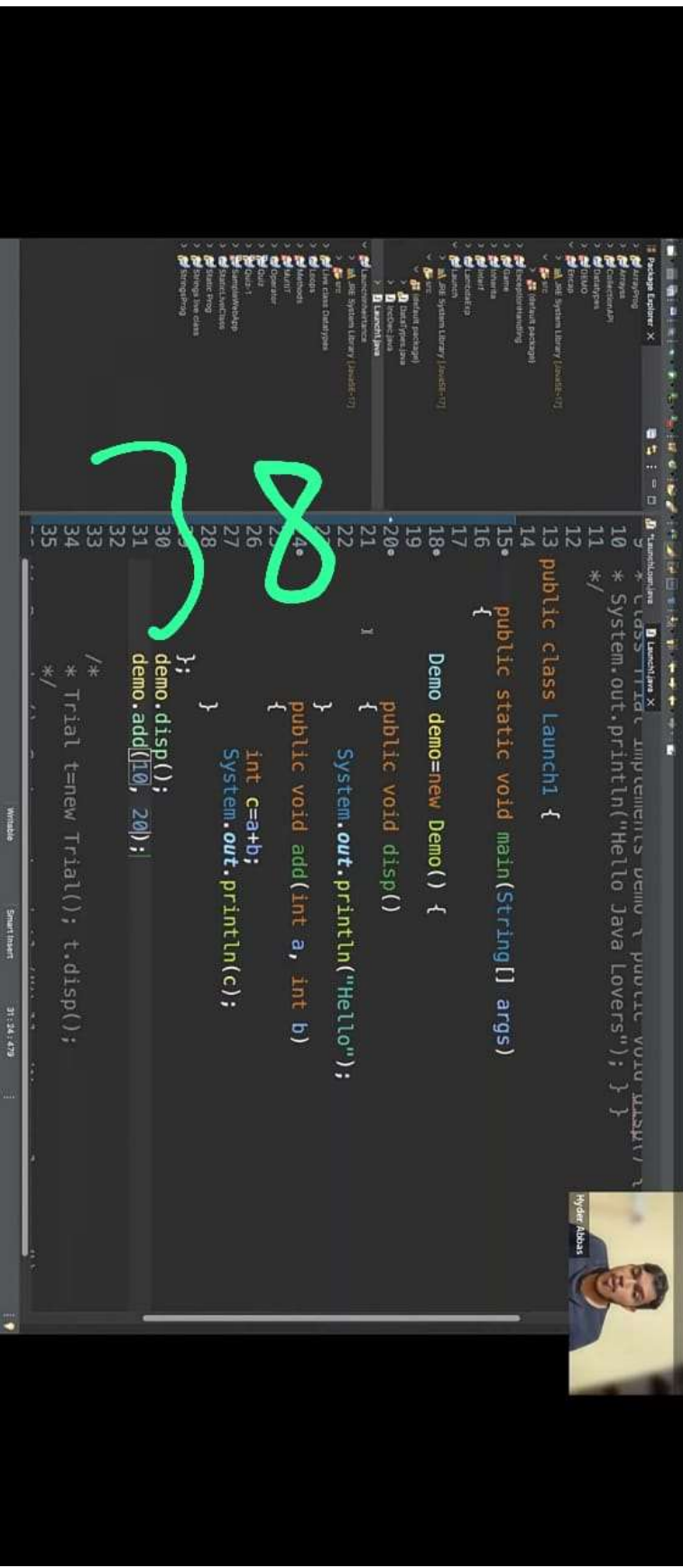
() -> {
s.o.p(x);
}
+
() -> s.o.p(x);
⊖

34









Hyder Abbas

```
1 //
2 @FunctionalInterface
3 interface Add
4 {
5     void add();
6 }
7
8
9 public class LaunchLambda {
10
11     public static void main(String[] args) {
12
13         Add a = () -> {
14             int num1=10;
15             int num2=20;
16             int res=num1+num2;
17             System.out.println(res);
18         };
19
20         a.add();
21     }
22 }
23
24
25
26
```

39

40

```
10 {
11     int sub(int num1);
12 }
13
14 public class LaunchLambda {
15
16     public static void main(String[] args) {
17         //
18         // Add add= ( a, b)->
19         {
20             // int res=a+b;
21             // System.out.println(res);
22         };
23
24         Sub s= num1 ->{
25             // int res=num1-5;
26             // return res;
27         };
28
29         System.out.println(s.sub(10));
30
31         //add.add(10,20);
32
33     }
34
35 }
36
```

Hyder Abbas

1:53 PM

```
10 {
11     int sub(int num1);
12 }
13
14 // to write lambda exp we use lambda operator (->)
15 // lambda operator divided into 2 parts to write lambda exp
16 // left side of lambda operator we write parameters required
17 // right side of lambda operator we write body or implementation
18 // left side for parameters datatype is optional
19 // write side if implementation or body has one statement then
20 // write side in body if its single line implementation then return
21 public class LaunchLambda {
22
23     public static void main(String[] args) {
24
25         Add add= ( a, b)->
26         {
27             int res=a+b;
28             System.out.println(res);
29         };
30
31         Sub s= num1 ->num1-5;
32         System.out.println(s.sub(10));
33         //add.add(10,20);
34
35 }
```

15



42

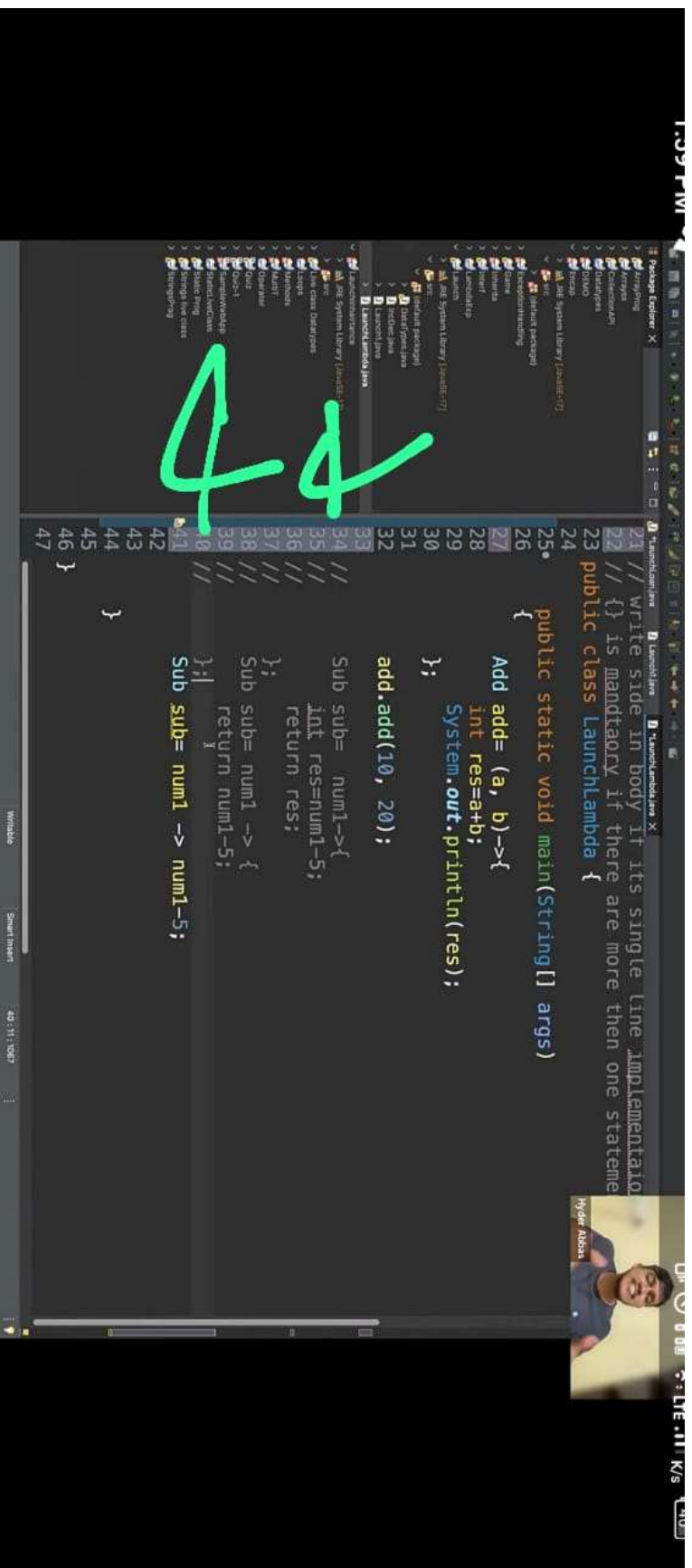
```
10
11
12
13
14 lambda operator (->)
15     2 parts to write lambda exp
16     we write parameters required
17     we write body or implementation
18     atype is optional
19     or body has one statement then {} is optional
20     ngle then () and type of data both optional
21     ngle line implementation then return statement is also optional
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
    ing[] args) {
        res);
        b(10));
```



IDE screenshot showing Java code for a lambda expression example. The code defines two interfaces, `@FunctionalInterface Add` and `@FunctionalInterface Sub`, and a class `LaunchLambda` with a `main` method. A large green handwritten '3' is visible over the code.

```
1 //
2 //
3 @FunctionalInterface
4 interface Add
5 {
6     void add(int a, int b);
7 }
8 @FunctionalInterface
9 interface Sub
10 {
11     int sub(int num1);
12 }
13
14 // to write lambda exp we use lambda operator (->)
15 // lambda operator divided into 2 parts to write lambda exp
16 // left side of lambda operator we write parameters required
17 // right side of lambda operator we write body or implementation
18 // left side for parameters datatype is optional
19 // write side if implementation or body has one statement then
20 // left side if parameter is single then () and type of data bo
21 // write side in body if its single line implementation then retr
22 public class LaunchLambda {
23
24     public static void main(String[] args)
25     {
26         Add add= (a, b)->{
27             int res=a+b;
```

IDE interface showing the project structure on the left, the code editor in the center, and a video feed of the presenter in the bottom right corner.



Hyder Abbas

```
1 interface CLS
2 {
3     int getLength(String str);
4 }
5
6
7
8 // #1
9 class LOS implements CLS
10 {
11     public int getLength(String str)
12     {
13         int length = str.length();
14         return length;
15     }
16 }
17
18 public class LaunchLambda2 {
19
20     public static void main(String[] args)
21     {
22         LOS l = new LOS();
23         System.out.println(l.getLength("iNeuron.ai"));
24     }
25 }
26
27 }
28
```

75

IDE screenshot showing Java code for a class named `LaunchLambda2`. The code includes a `main` method and a `getLength` method. A large green handwritten mark is visible over the code.

```
11 // public int getLength(String str)
12 // {
13 //     int length=str.length();
14 //     return length;
15 // }
16 //}
17
18 public class LaunchLambda2 {
19
20     public static void main(String[] args)
21     {
22         LOS l=new LOS();
23         System.out.println(l.getLength("iNeuron.ai"));
24
25         CLS cls=new CLS() {
26
27             public int getLength(String str)
28             {
29                 return str.length();
30             }
31         };
32         System.out.println(cls.getLength("iNeuron.ai"));
33
34
35
36 }
37
```

Window: Smart IntelliJ 2:21:55

Hyder Abbas

2:03 PM

```
14 //  
15 // }  
16 //}  
17  
18 public class LaunchLambda2 {  
19  
20* public static void main(String[] args)  
21 {  
22 // LOS l=new LOS();  
23 // System.out.println(l.getLength("iNeuron.ai"));  
24  
25 // CLS cls=new CLS() {  
26 //     public int getLength(String str)  
27 //     {  
28 //         return str.length();  
29 //     }  
30 // }  
31 //  
32 // System.out.println(cls.getLength("iNeuron.ai"));  
33  
34 CLS cls= str -> str.length();  
35  
36 System.out.println(cls.getLength("iNeuron.ai"));  
37  
38 }  
39  
40 }
```

47

