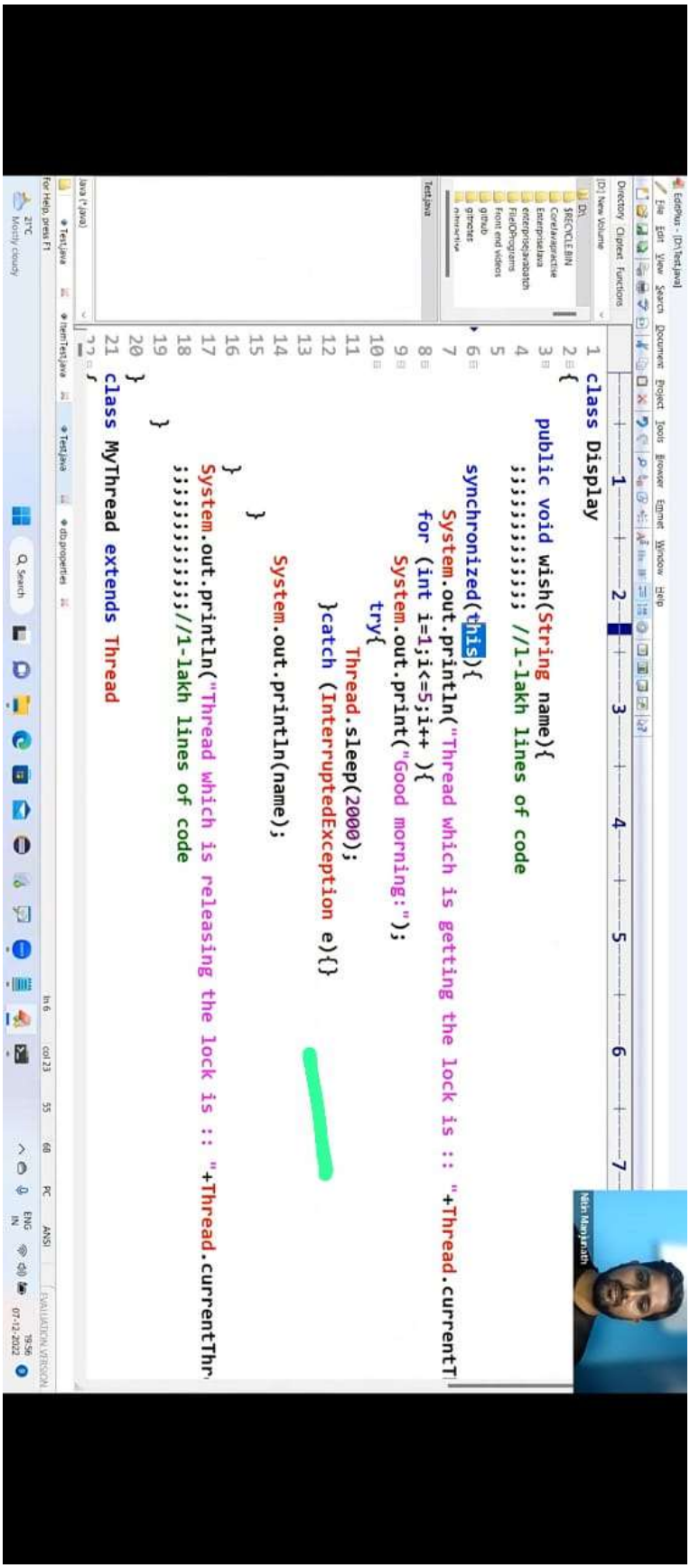
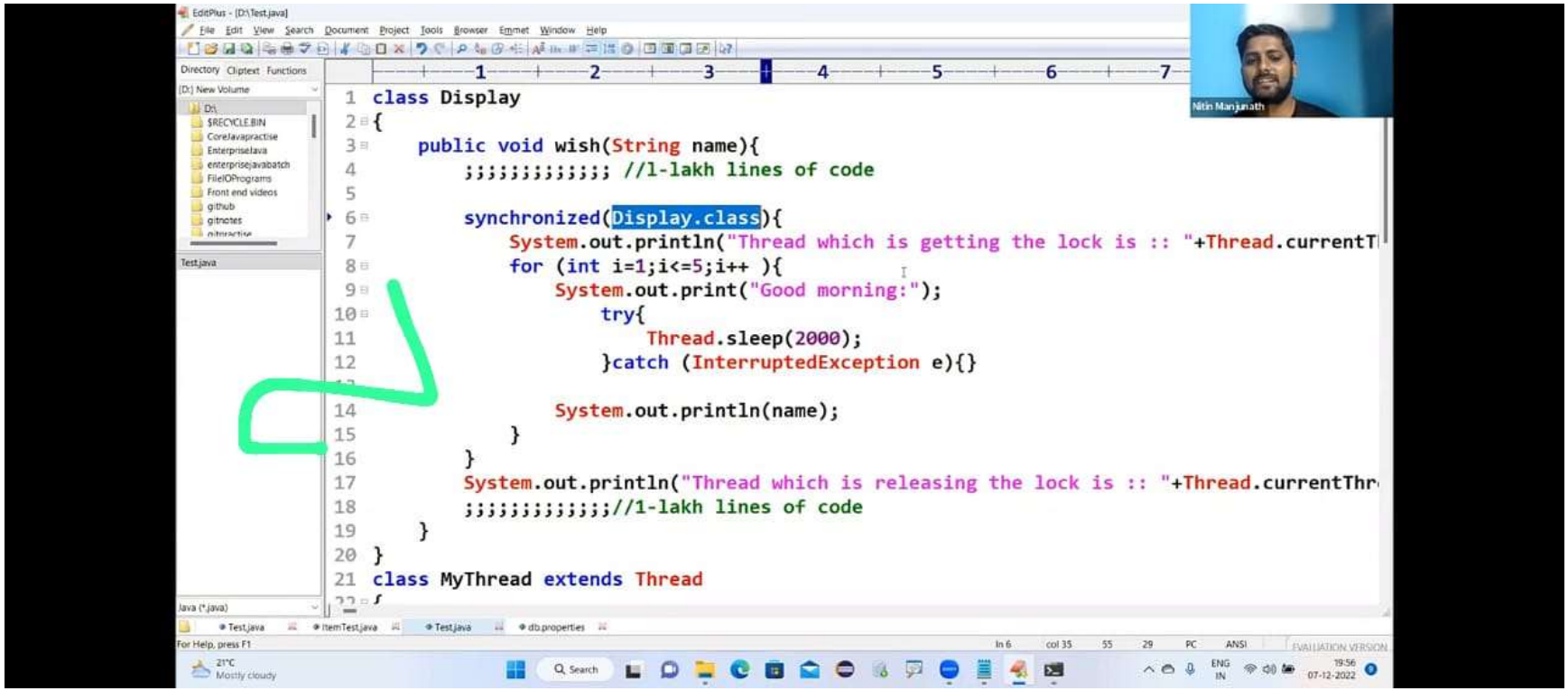
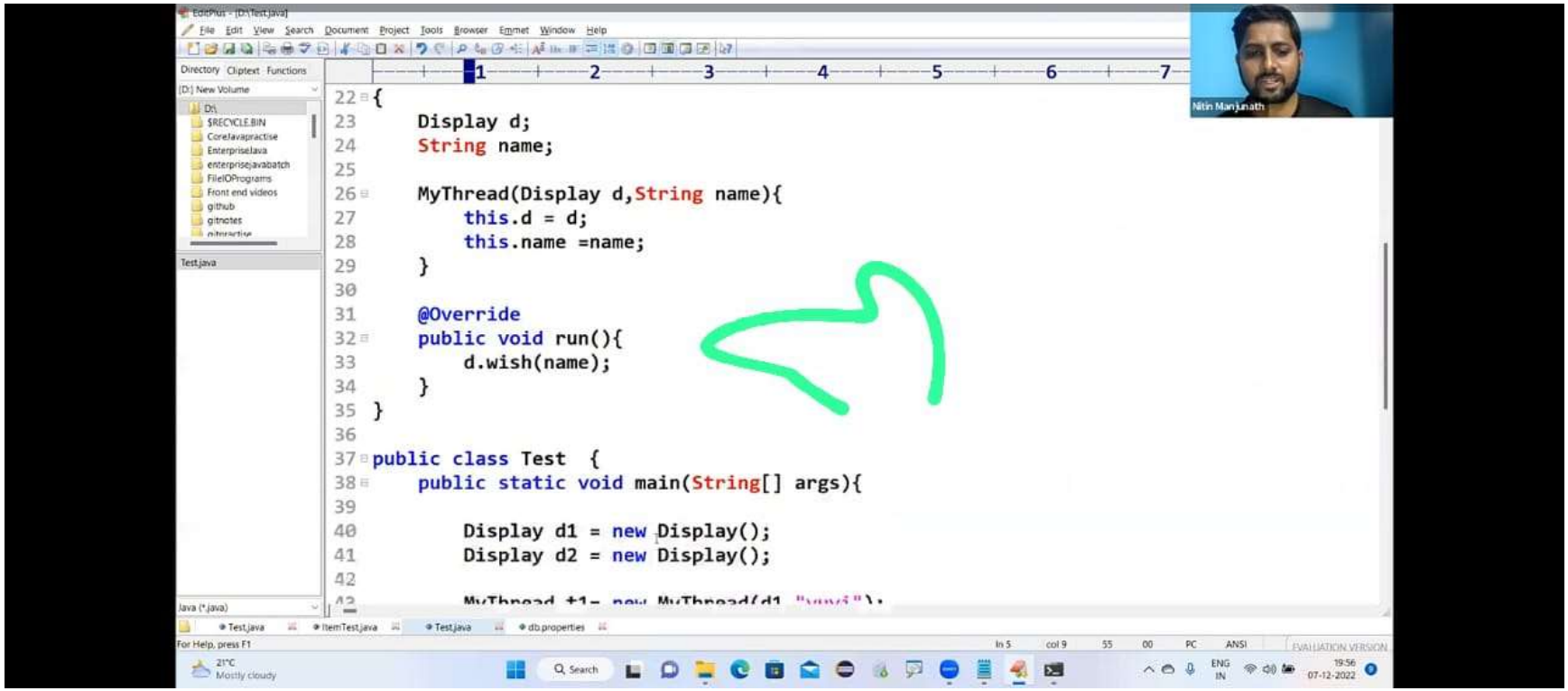
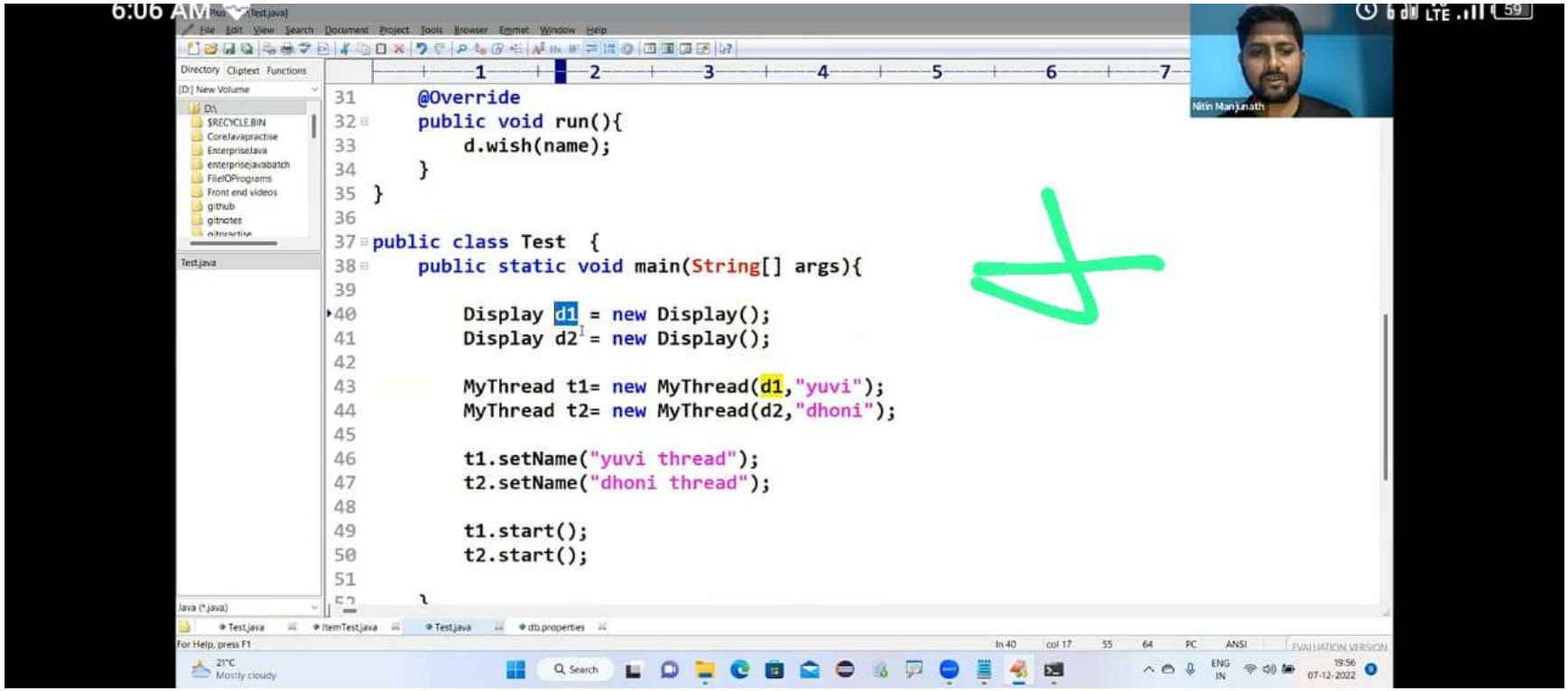
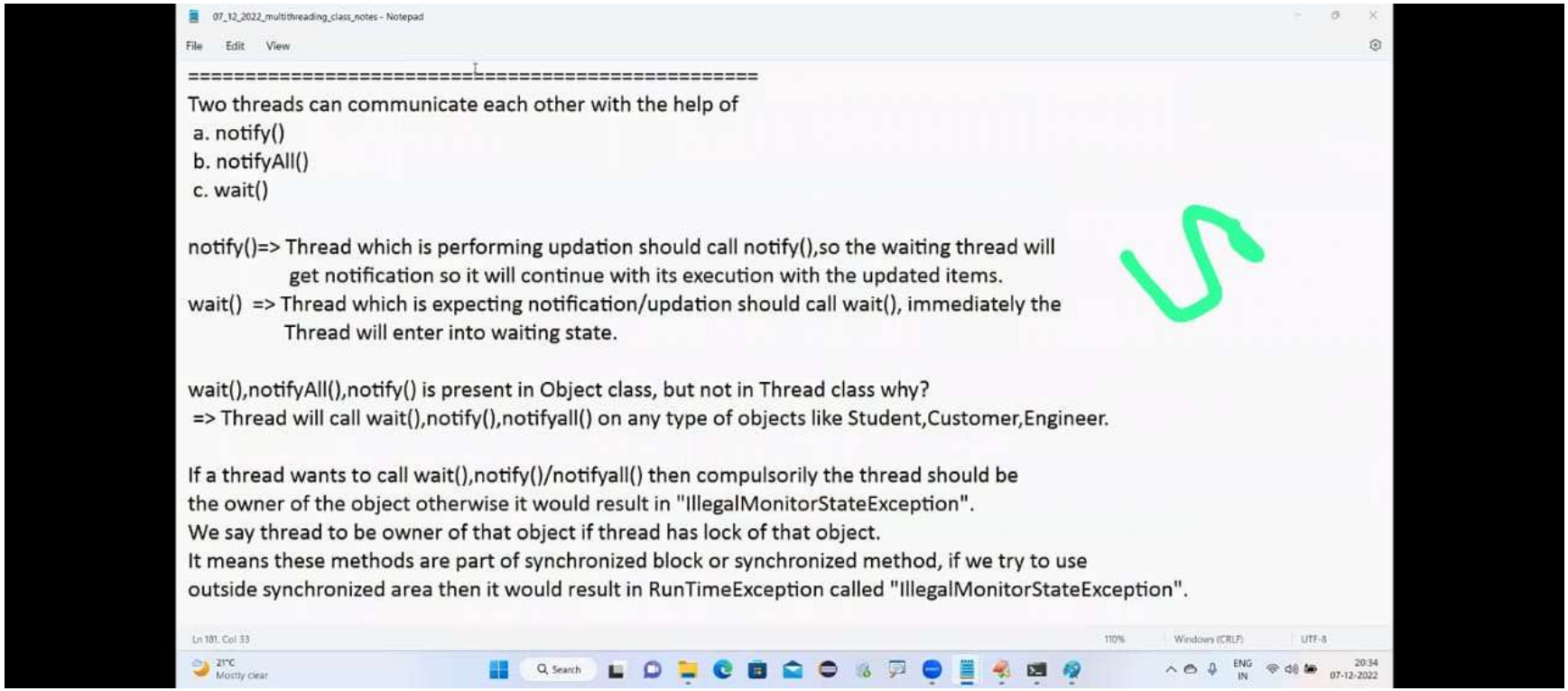
Java Multithreading Part5

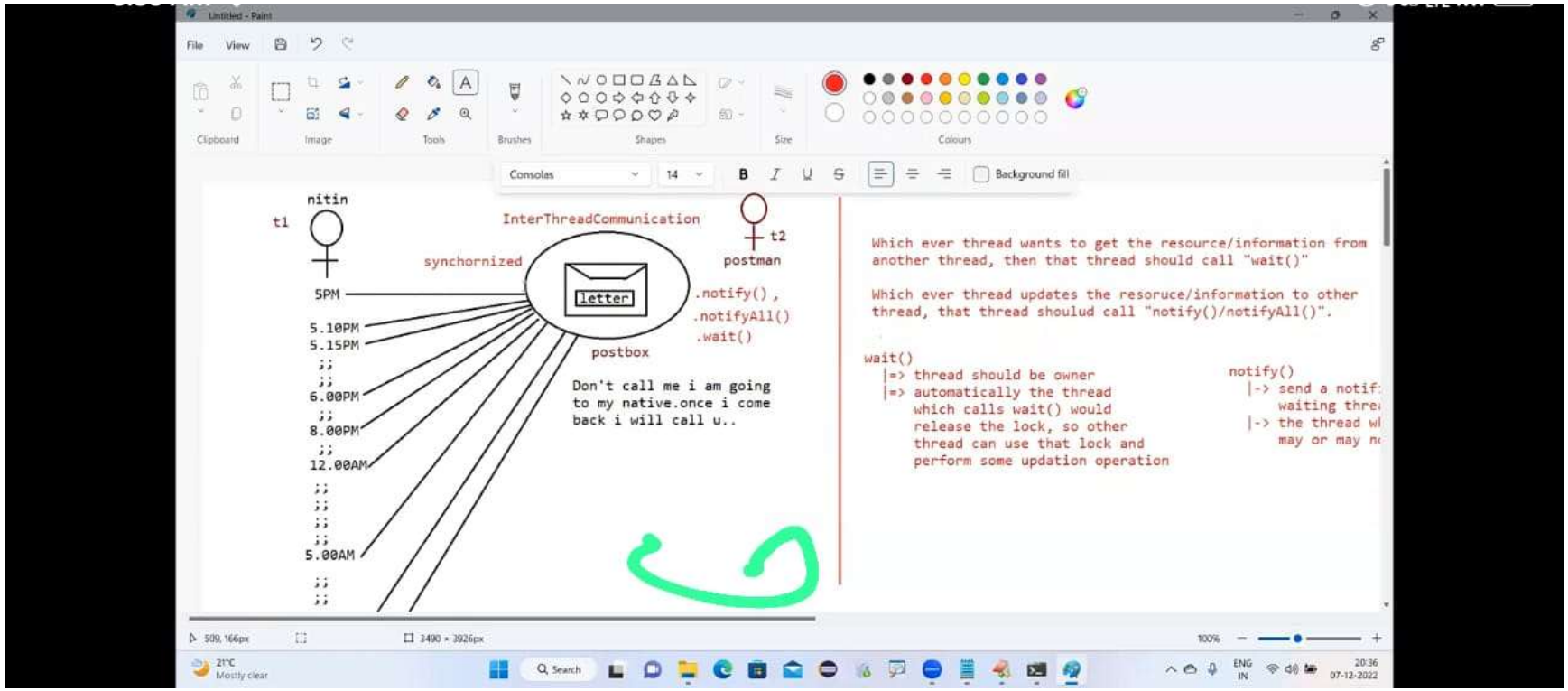


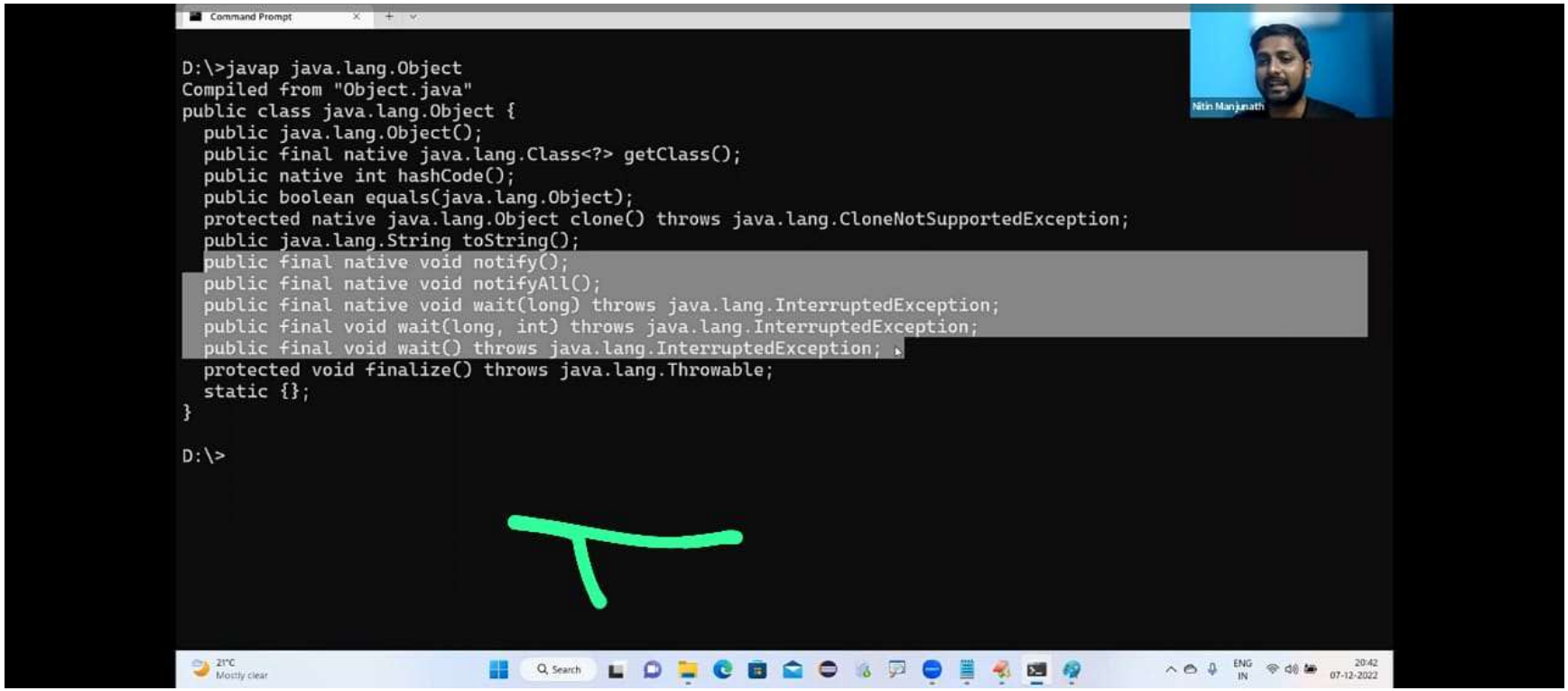

EditPlus - [D:\Test.java]
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
[D:] New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
Enterprisejava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
1 class Display
2 {
3 public void wish(String name){
4 ;;;;;;;;;;;;; //1-lakh lines of code
5
6 synchronized(Display.class){
7 System.out.println("Thread which is getting the lock is :: "+Thread.currentT
8 for (int i=1;i<=5;i++){
9 System.out.print("Good morning:");
10 try{
11 Thread.sleep(2000);
12 }catch (InterruptedException e){}
14 System.out.println(name);
15 }
16 }
17 System.out.println("Thread which is releasing the lock is :: "+Thread.currentThr
18 ;;;;;;;;;;;;;//1-lakh lines of code
19 }
20 }
21 class MyThread extends Thread
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 6 col 35 55 29 PC ANSI
EVALUATION VERSION
21°C
Mostly cloudy
Search
ENG
IN
19:56
07-12-2022

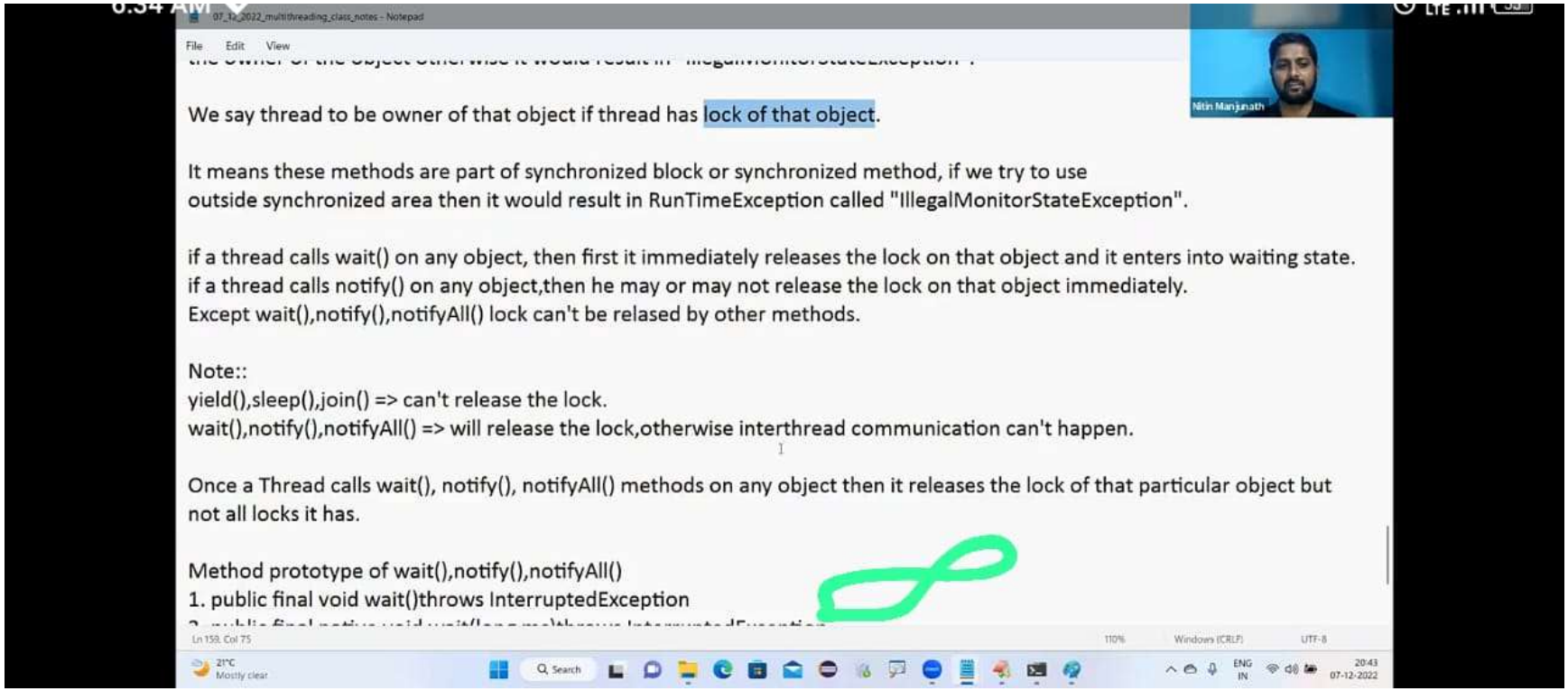

Nitin Manjunath
{
Display d;
String name;
MyThread(Display d,String name){
this.d = d;
this.name =name;
}
@Override
public void run(){
d.wish(name);
}
}
public class Test {
public static void main(String[] args){
Display d1 = new Display();
Display d2 = new Display();


6:06 AM
Test.java
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
[D:] New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
Enterprisejava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
@Override
public void run(){
d.wish(name);
}
}
public class Test {
public static void main(String[] args){
Display d1 = new Display();
Display d2 = new Display();
MyThread t1= new MyThread(d1,"yuvi");
MyThread t2= new MyThread(d2,"dhoni");
t1.setName("yuvi thread");
t2.setName("dhoni thread");
t1.start();
t2.start();
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 40 col 17 55 64 PC ANSI
EVALUATION VERSION
21°C
Mostly cloudy
Search
ENG
IN
19:56
07-12-2022


07_12_2022_multithreading_class_notes - Notepad
File Edit View
==========
Two threads can communicate each other with the help of
a. notify()
b. notifyAll()
c. wait()
notify()=> Thread which is performing updation should call notify(),so the waiting thread will get notification so it will continue with its execution with the updated items.
wait() => Thread which is expecting notification/updation should call wait(), immediately the Thread will enter into waiting state.
wait(),notifyAll(),notify() is present in Object class, but not in Thread class why?
=> Thread will call wait(),notify(),notifyall() on any type of objects like Student,Customer,Engineer.
If a thread wants to call wait(),notify()/notifyall() then compulsorily the thread should be the owner of the object otherwise it would result in "IllegalMonitorStateException".
We say thread to be owner of that object if thread has lock of that object.
It means these methods are part of synchronized block or synchronized method, if we try to use outside synchronized area then it would result in RunTimeException called "IllegalMonitorStateException".
Ln 181, Col 33
110%
Windows (CRLF)
UTF-8
21°C
Mostly clear
Search
ENG
IN
20:34
07-12-2022


Untitled - Paint
File
View
Consolas
14
Background fill
nitin
t1
InterThreadCommunication
t2
postman
synchornized
letter
postbox
.notify() ,
.notifyAll()
.wait()
5PM
5.10PM
5.15PM
6.00PM
8.00PM
12.00AM
5.00AM
Don't call me i am going to my native.once i come back i will call u..
Which ever thread wants to get the resource/information from another thread, then that thread should call "wait()"
Which ever thread updates the resoruce/information to other thread, that thread shoulud call "notify()/notifyAll()".
wait()
|=> thread should be owner
|=> automatically the thread which calls wait() would release the lock, so other thread can use that lock and perform some updation operation
notify()
|-> send a notif
waiting thre
|-> the thread wi
may or may n
100%
21°C
Mostly clear
Search
ENG
IN
20:36
07-12-2022


Command Prompt
D:\>javap java.lang.Object
Compiled from "Object.java"
public class java.lang.Object {
public java.lang.Object();
public final native java.lang.Class<?> getClass();
public native int hashCode();
public boolean equals(java.lang.Object);
protected native java.lang.Object clone() throws java.lang.CloneNotSupportedException;
public java.lang.String toString();
public final native void notify();
public final native void notifyAll();
public final native void wait(long) throws java.lang.InterruptedException;
public final void wait(long, int) throws java.lang.InterruptedException;
public final void wait() throws java.lang.InterruptedException;
protected void finalize() throws java.lang.Throwable;
static {};
}
D:\>
Nitin Manjunath
21°C
Mostly clear
Search
ENG
IN
20:42
07-12-2022


07_12_2022_multithreading_class_notes - Notepad
File Edit View
Nitin Manjunath
We say thread to be owner of that object if thread has lock of that object.
It means these methods are part of synchronized block or synchronized method, if we try to use
outside synchronized area then it would result in RunTimeException called "IllegalMonitorStateException".
if a thread calls wait() on any object, then first it immediately releases the lock on that object and it enters into waiting state.
if a thread calls notify() on any object,then he may or may not release the lock on that object immediately.
Except wait(),notify(),notifyAll() lock can't be relased by other methods.
Note::
yield(),sleep(),join() => can't release the lock.
wait(),notify(),notifyAll() => will release the lock,otherwise interthread communication can't happen.
Once a Thread calls wait(), notify(), notifyAll() methods on any object then it releases the lock of that particular object but
not all locks it has.
Method prototype of wait(),notify(),notifyAll()
1. public final void wait()throws InterruptedException
Ln 159, Col 75
110%
Windows (CRLF)
UTF-8
21°C
Mostly clear
Search
ENG
IN
20:43
07-12-2022

07_12_2022_multithreading_class_notes - Notepad

File Edit View

Method prototype of wait(),notify(),notifyAll()

1. public final void wait()throws InterruptedException
2. public final native void wait(long ms)throws InterruptedException
3. public final void wait(long ms,int ns)throws InterruptedException
4. public final native void notify()
5. public final void notifyAll()

Interview Question

==========

Method like wait(),notify(),notifyAll() are present inside Object class, y not in Thread class?

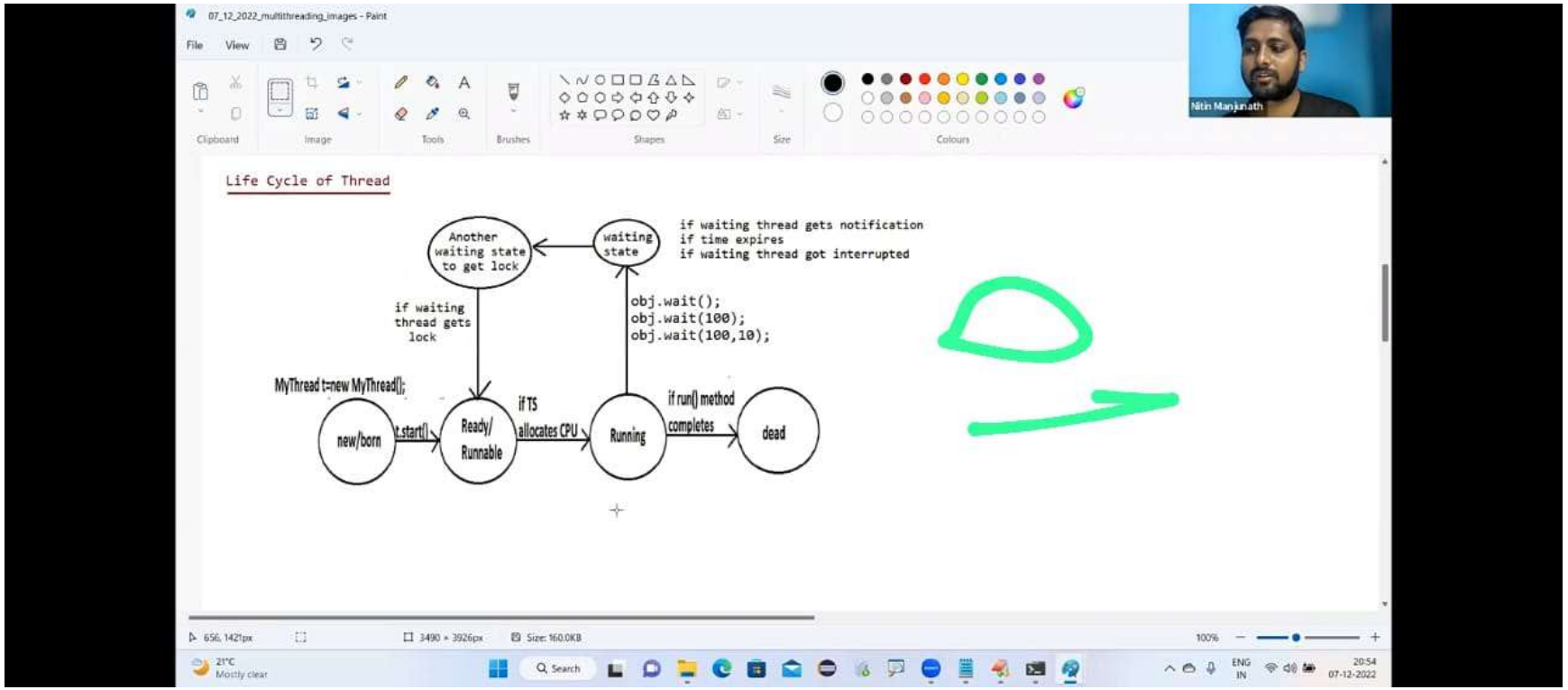
Thread will call wait(),notify(),notifyAll() on Objects like PostBox,Stack,Customer,Student,....

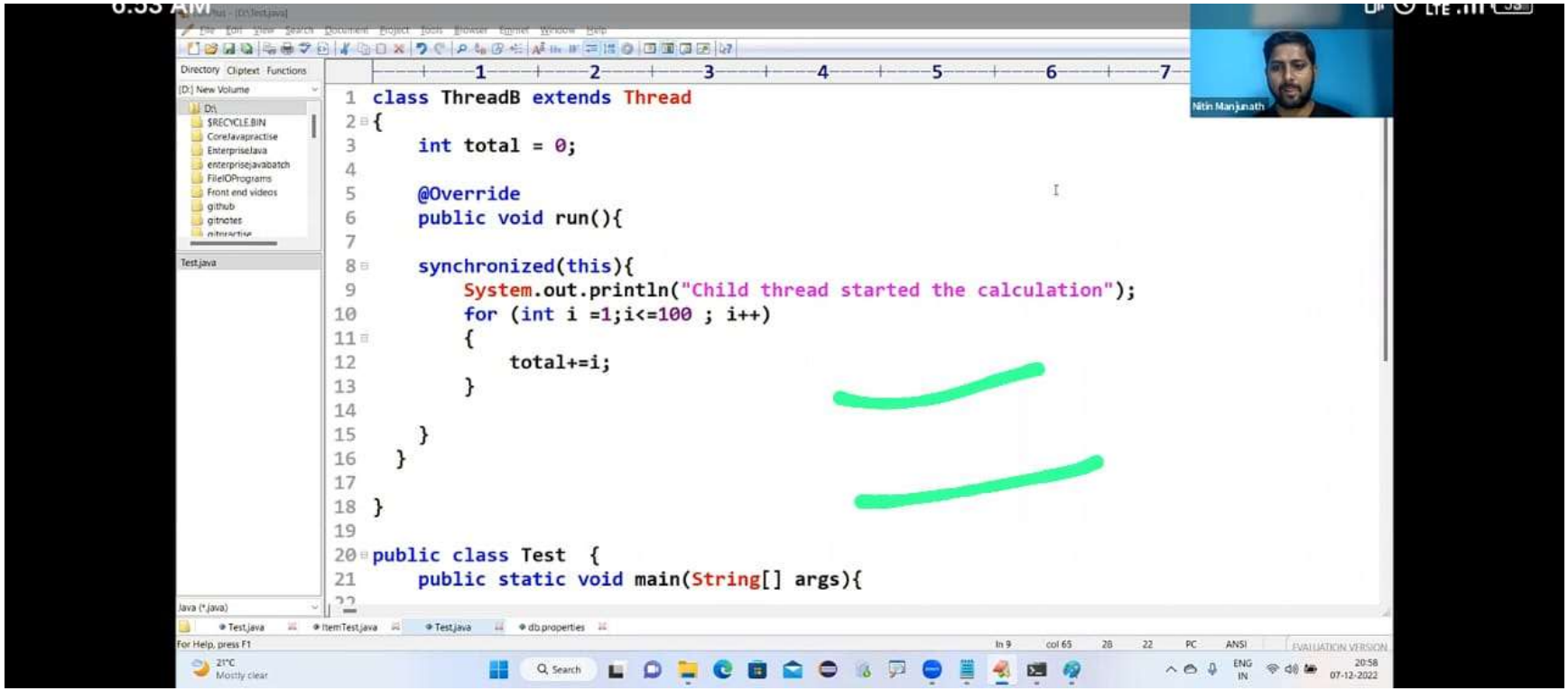
=> obj.wait(),obj.notify(),obj.notifyAll()

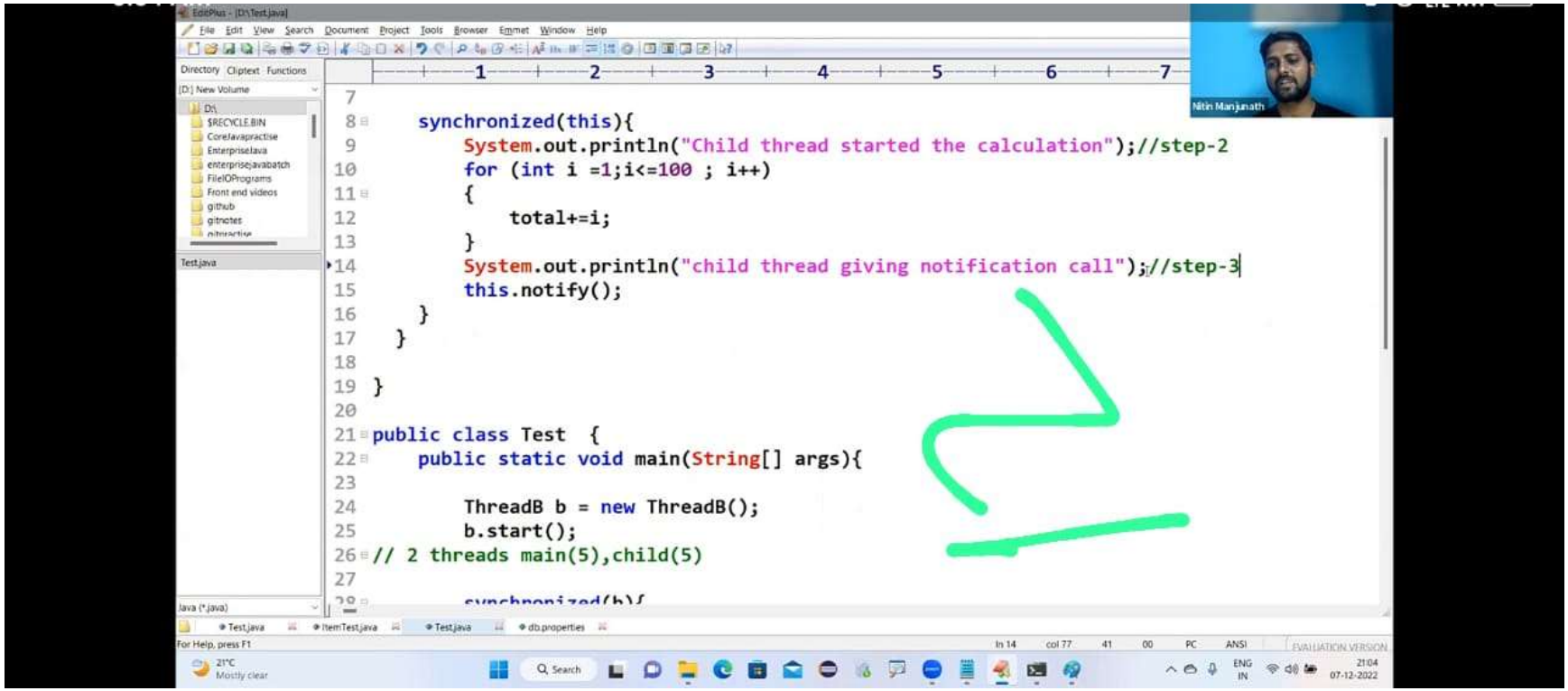
These methods should be available for every object in java,if the method has to available for every object in java then those methods should come from "Object" class.

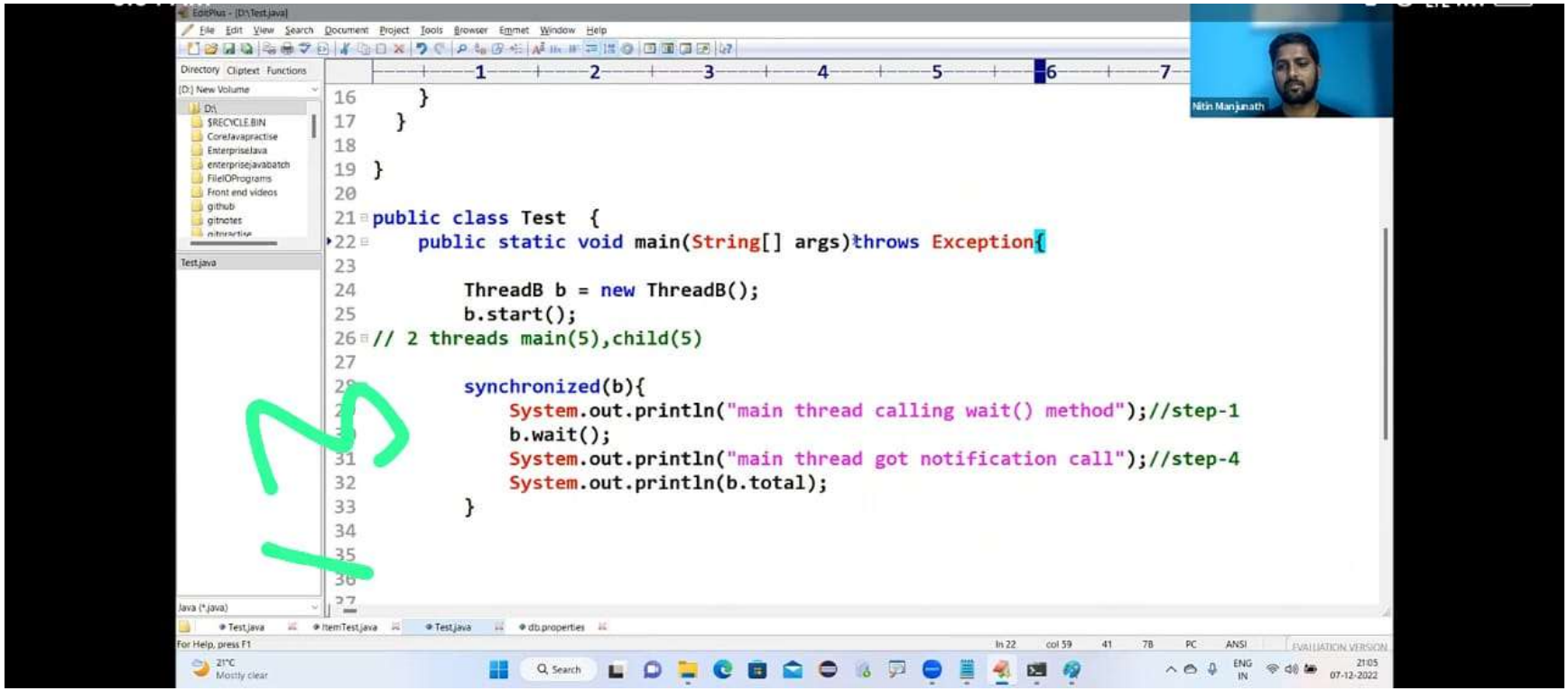
Ln 189, Col 1 110% Windows (CRLF) UTF-8

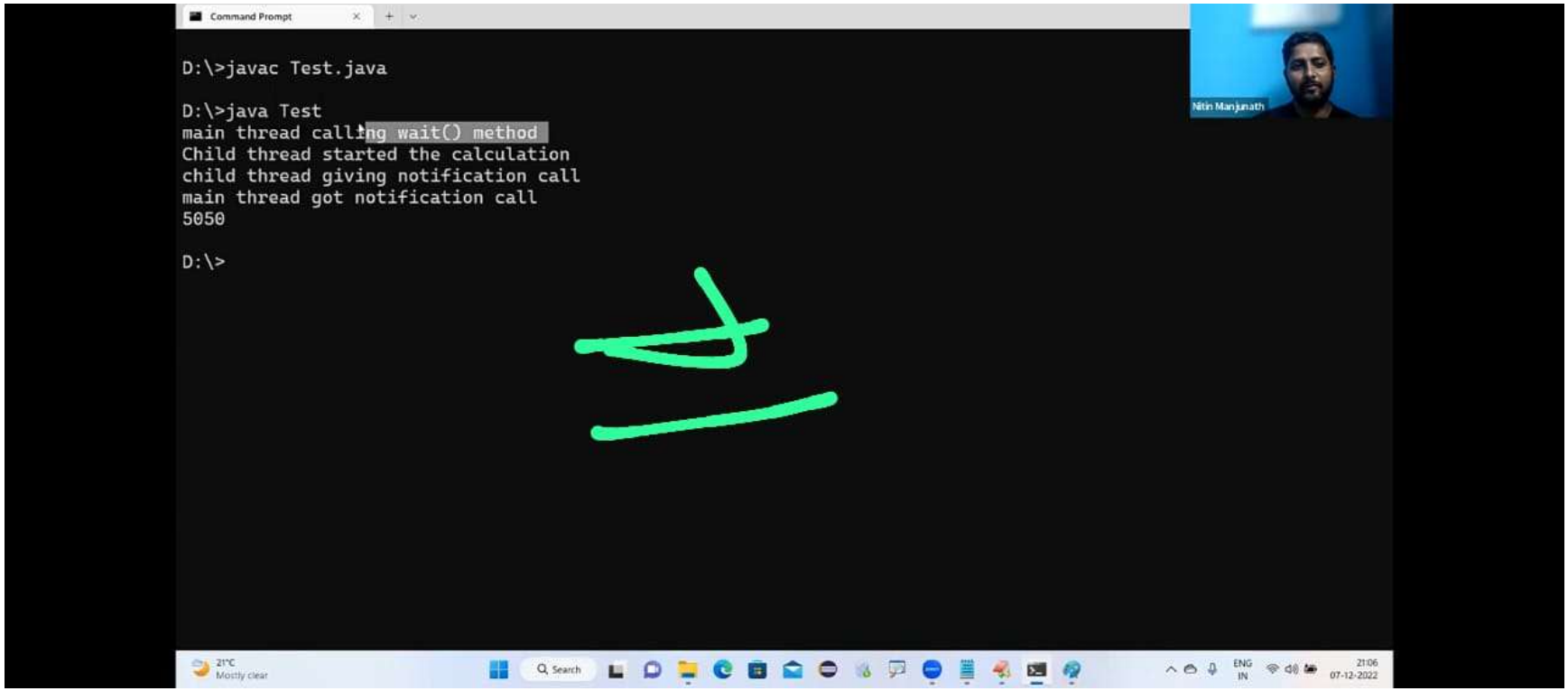
21°C Mostly clear Search ENG IN 20:47 07-12-2022

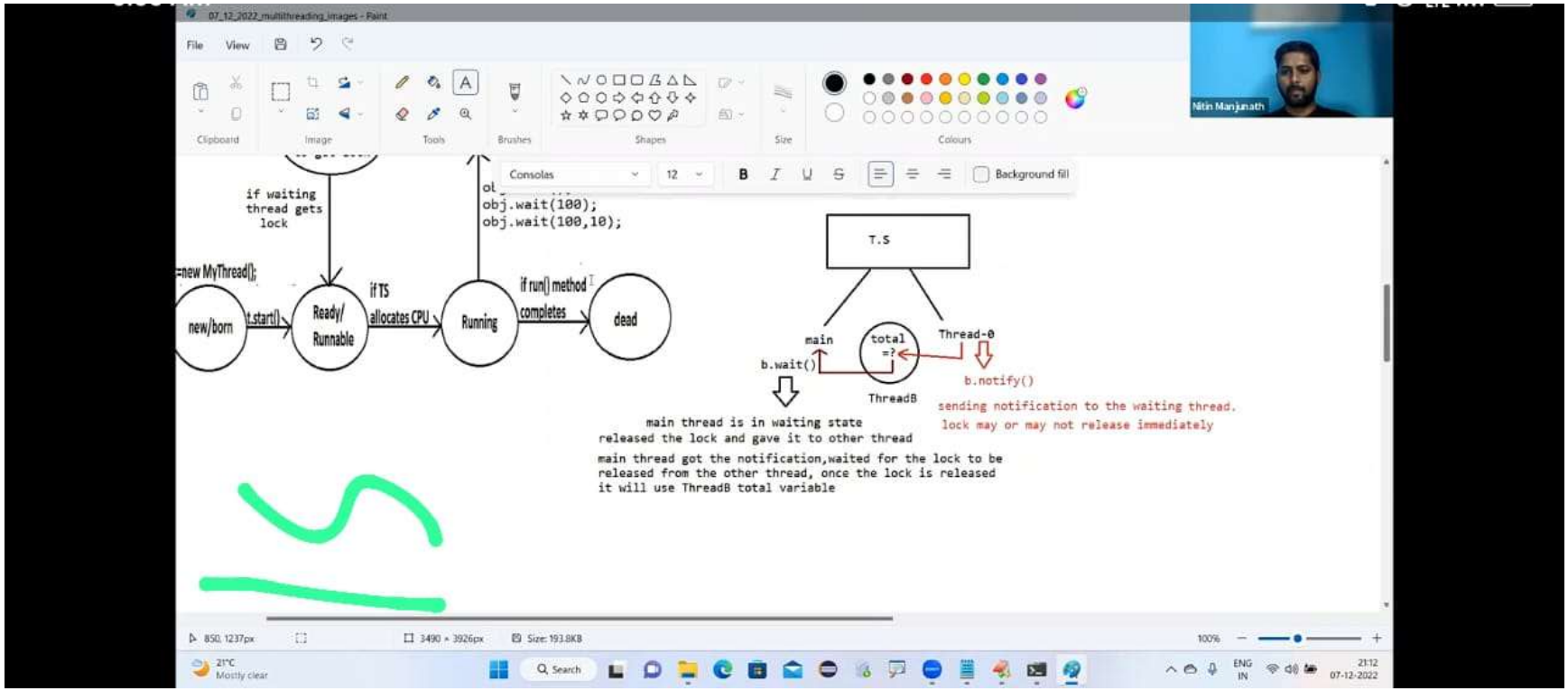

07_12_2022_multithreading_images - Paint
File
View
Nitin Manjunath
Life Cycle of Thread
Another waiting state to get lock
waiting state
if waiting thread gets notification
if time expires
if waiting thread got interrupted
if waiting thread gets lock
obj.wait();
obj.wait(100);
obj.wait(100,10);
MyThread t=new MyThread();
new/born
t.start()
Ready/ Runnable
if TS allocates CPU
Running
if run() method completes
dead
100%
21°C
Mostly clear
Search
ENG
IN
20:54
07-12-2022

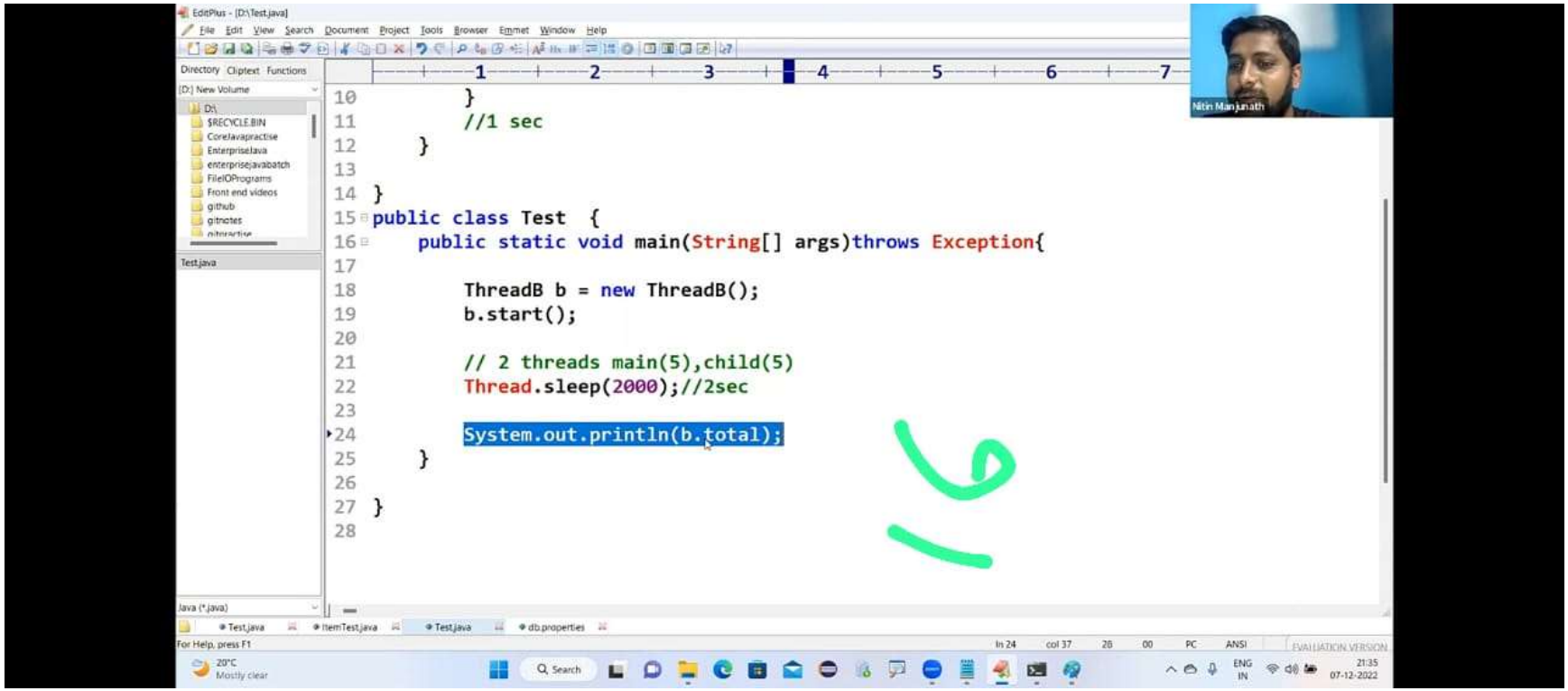

Nitin Manjunath
class ThreadB extends Thread
{
int total = 0;
@Override
public void run(){
synchronized(this){
System.out.println("Child thread started the calculation");
for (int i =1;i<=100 ; i++)
{
total+=i;
}
}
}
}
public class Test {
public static void main(String[] args){

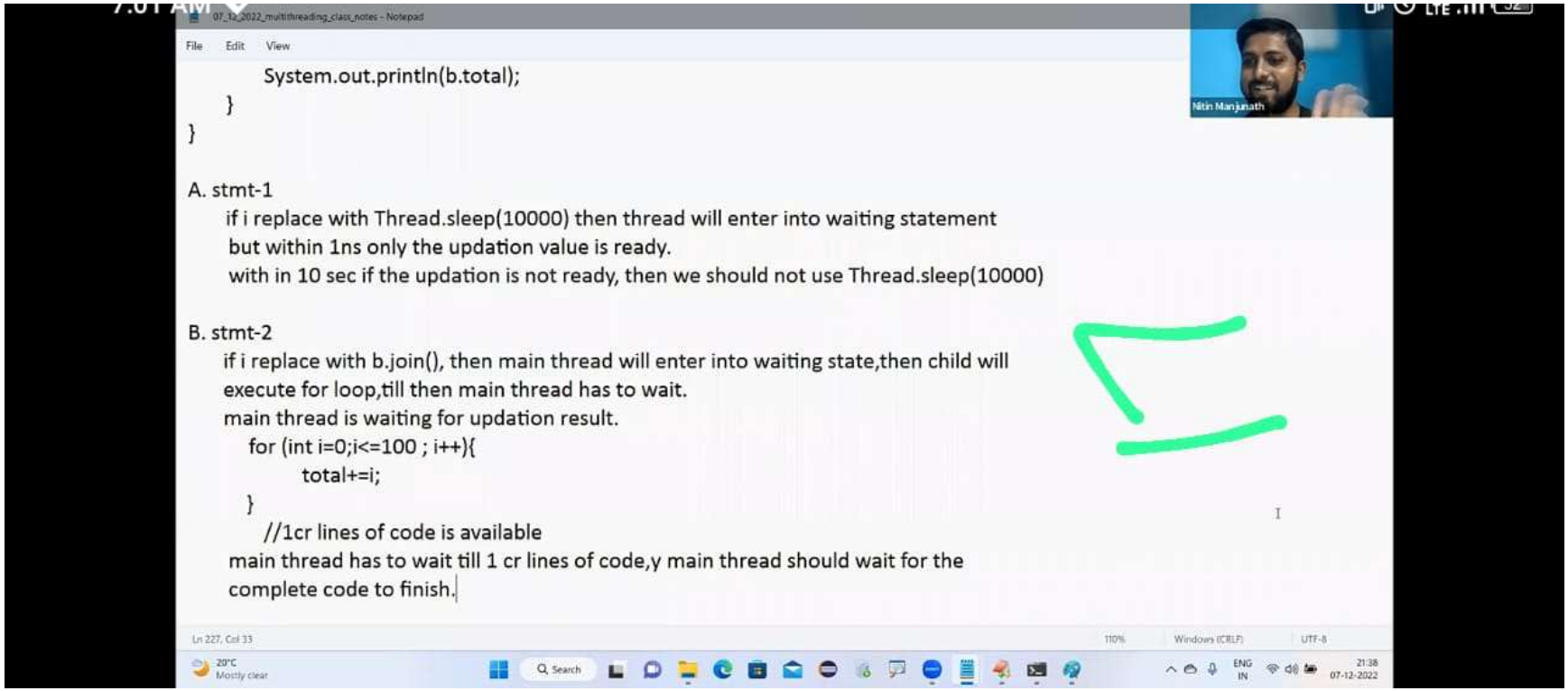

EditPlus - [D:\Test.java]
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
[D:] New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
Enterprisejava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
synchronized(this){
System.out.println("Child thread started the calculation");//step-2
for (int i =1;i<=100 ; i++)
{
total+=i;
}
System.out.println("child thread giving notification call");//step-3
this.notify();
}
}
}
public class Test {
public static void main(String[] args){
ThreadB b = new ThreadB();
b.start();
// 2 threads main(5),child(5)
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 14 col 77 41 00 PC ANSI
EVALUATION VERSION
21°C
Mostly clear
Search
ENG
IN
21:04
07-12-2022

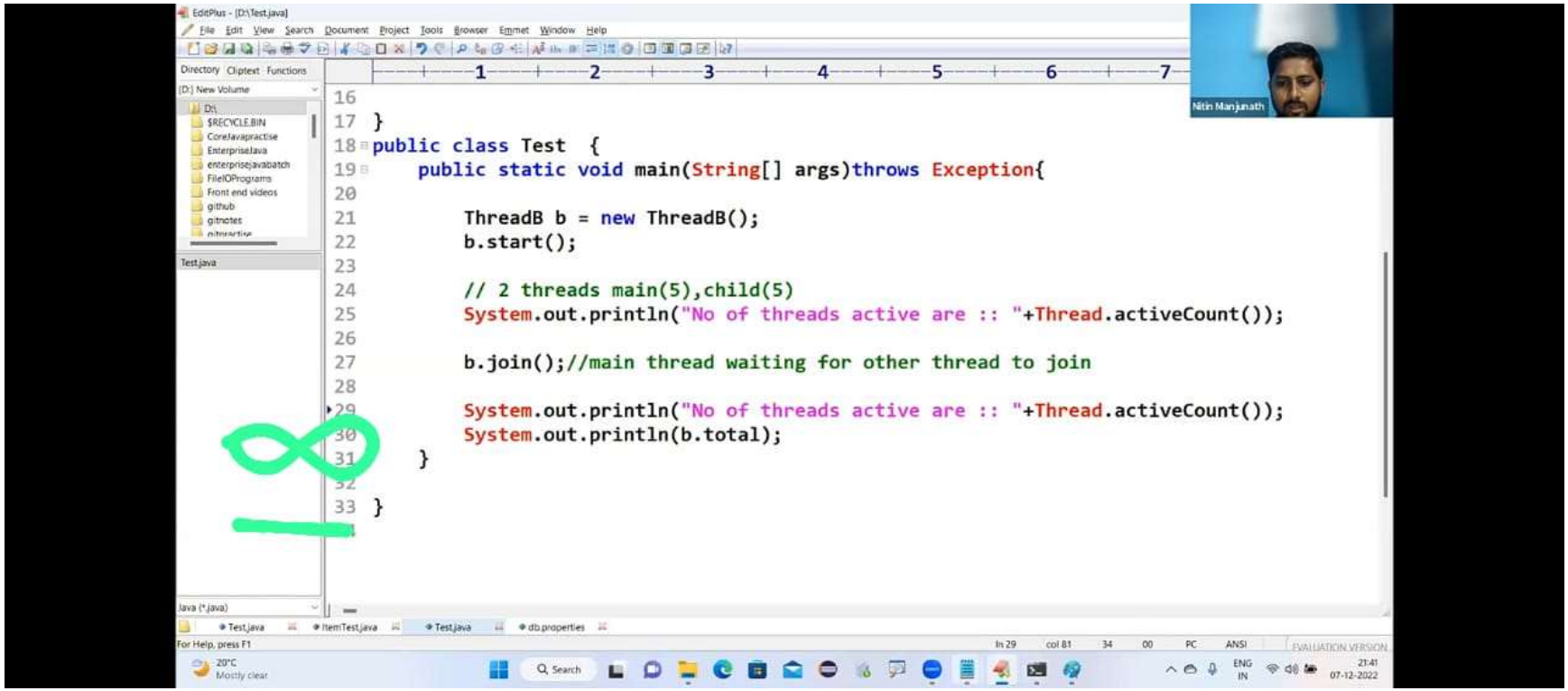

EditPlus - [D:\Test.java]
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
(D:) New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
EnterpriseJava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
16 }
17 }
18
19 }
20
21 public class Test {
22 public static void main(String[] args)throws Exception{
23
24 ThreadB b = new ThreadB();
25 b.start();
26 // 2 threads main(5),child(5)
27
28 synchronized(b){
29 System.out.println("main thread calling wait() method");//step-1
30 b.wait();
31 System.out.println("main thread got notification call");//step-4
32 System.out.println(b.total);
33 }
34
35
36
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 22 col 59 41 78 PC ANSI
EVALUATION VERSION
21°C
Mostly clear
Search
ENG
IN
21:05
07-12-2022


Command Prompt
D:\>javac Test.java
D:\>java Test
main thread calling wait() method
Child thread started the calculation
child thread giving notification call
main thread got notification call
5050
D:\>
Nitin Manjunath
21°C
Mostly clear
Search
ENG
IN
21:06
07-12-2022


07_12_2022_multithreading_images - Paint
File
View
Nitin Manjunath
Consolas
12
Background fill
if waiting thread gets lock
obj.wait(100);
obj.wait(100,10);
=new MyThread();
new/born
t.start()
Ready/ Runnable
if TS allocates CPU
Running
if run() method completes
dead
T.S
main
total =?
Thread-0
b.wait()
b.notify()
ThreadB
sending notification to the waiting thread.
lock may or may not release immediately
main thread is in waiting state
released the lock and gave it to other thread
main thread got the notification,waited for the lock to be released from the other thread, once the lock is released it will use ThreadB total variable
850, 1237px
3490 × 3926px
Size: 193.8KB
100%
21°C
Mostly clear
Search
ENG
IN
21:12
07-12-2022


EditPlus - [D:\Test.java]
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
[D:] New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
EnterpriseJava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
}
//1 sec
}
}
public class Test {
public static void main(String[] args)throws Exception{
ThreadB b = new ThreadB();
b.start();
// 2 threads main(5),child(5)
Thread.sleep(2000);//2sec
System.out.println(b.total);
}
}
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 24 col 37 28 00 PC ANSI
EVALUATION VERSION
20°C
Mostly clear
Search
ENG
IN
21:35
07-12-2022


07_12_2022_multithreading_class_notes - Notepad
File Edit View
System.out.println(b.total);
}
}
A. stmt-1
if i replace with Thread.sleep(10000) then thread will enter into waiting statement
but within 1ns only the updation value is ready.
with in 10 sec if the updation is not ready, then we should not use Thread.sleep(10000)
B. stmt-2
if i replace with b.join(), then main thread will enter into waiting state,then child will
execute for loop,till then main thread has to wait.
main thread is waiting for updation result.
for (int i=0;i<=100 ; i++){
total+=i;
}
//1cr lines of code is available
main thread has to wait till 1 cr lines of code,y main thread should wait for the
complete code to finish.
Nitin Manjunath
Ln 227, Col 33
110%
Windows (CRLF)
UTF-8
20°C
Mostly clear
Search
ENG
IN
21:38
07-12-2022


EditPlus - [D:\Test.java]
File Edit View Search Document Project Tools Browser Emmet Window Help
Directory Cliptext Functions
[D:] New Volume
D:\
$RECYCLE.BIN
CoreJavapractise
EnterpriseJava
enterprisejavabatch
FileIOPrograms
Front end videos
github
gitnotes
Test.java
Nitin Manjunath
16
17 }
18 public class Test {
19 public static void main(String[] args)throws Exception{
20
21 ThreadB b = new ThreadB();
22 b.start();
23
24 // 2 threads main(5),child(5)
25 System.out.println("No of threads active are :: "+Thread.activeCount());
26
27 b.join();//main thread waiting for other thread to join
28
29 System.out.println("No of threads active are :: "+Thread.activeCount());
30 System.out.println(b.total);
31 }
32
33 }
Test.java
ItemTest.java
Test.java
db.properties
For Help, press F1
ln 29 col 81 34 00 PC ANSI
EVALUATION VERSION
20°C
Mostly clear
Search
ENG
IN
21:41
07-12-2022