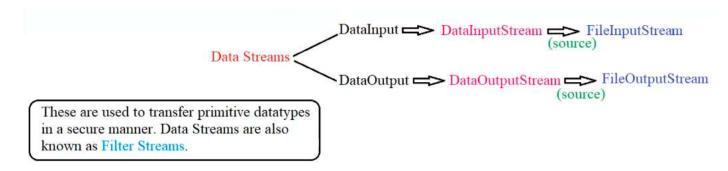


Understanding Data Streams:

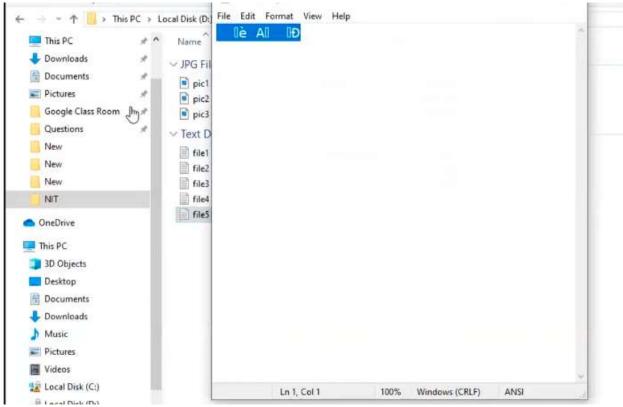
- These Streams handle binary I/O operations on primitive data types.
- DataInputStream and DataOutputStream are filter streams (A filter stream filters data as it's being read or written to the stream)that let you read or write primitive data types
- DataInputStream and DataOutputStream implement the DataInput and DataOutput interfaces, respectively.
- These interfaces define methods for reading or writing the Java primitive types, including numbers and Boolean values.
- DataOutputStream encodes these values in a machine-independent manner and then writes them to its underlying byte stream.
- DataInputStream is created with a FileInputStream as source for its data.
- DataOutputStream is created with a FileOutputStream as source for its data.



DataInpt and DataOutput are interfaces

```
S IMPORT Java. 10. DataOutputStream,
 4 import java.io.FileOutputStream;
 6 public class ClassA
 7 {
 88
       void fileOperations() throws Exception
 9
       {
10
           System.out.println("Implementing DataStreams");
11
12
           DataOutputStream dos=new DataOutputStream(new FileOutputStream("D:\\NIT\\file5.txt"));
13
           System.out.println("Connection Created");
15
           dos.writeInt(1000);
           dos.writeChar('A');
                                                         Ι
17
           dos.writeBoolean(true);
18
           dos.writeInt(2000);
19
           System.out.println("Data Entered");
20
21
           dos.close();
22
238
       public static void main(String[] args) throws Exception
24
25
           new ClassA().fileOperations();
26
```

```
TIMPOTE Java. TO. DataOutputstream,
                                                                     Implementing DataStreams
 4 import java.io.FileOutputStream;
                                                                     Connection Created
                                                                     Data Entered
 6 public class ClassA
 7
 89
       void fileOperations() throws Exception
 9
10
           System.out.println("Implementing DataStreams");
11
12
           DataOutputStream dos=new DataOutputStream(new FileOut
13
           System.out.println("Connection Created");
14
15
           dos.writeInt(1000);
16
           dos.writeChar('A');
17
           dos.writeBoolean(true);
18
           dos.writeInt(2000);
19
20
           System.out.println("Data Entered");
21
           dos.close();
22
       public static void main(String[] args) throws Exception
238
24
25
           new ClassA().fileOperations();
20
```



```
<terminated> ClassA [Java Application] C:\Program File
16
                                                                                          Implementing DataStreams
17
           dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                          Data Entered
19
           dos.writeBoolean(true);
20
           dos.writeInt(2000);
                                                                                          Connection Created
21
                                                                                           1000
22
           System.out.println("Data Entered");
                                                                                  Line 16
23
           dos.close();
24
                                                                                          2000
           DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
25
26
           System.out.println("\nConnection Created");
27
28
           System.out.println(dis.readInt());
29
           System.out.println(dis.readChar());
30
            System.out.println(dis.readBoolean());
31
           System.out.println(dis.readInt());
32
33
           dis.close();
34
35
369
       public static void main(String[] args) throws Exception
37
38
           new ClassA().fileOperations();
                                                                                         <terminated> ClassA [Java Application] C:\Program File
16
                                                                                          Implementing DataStreams
17
           dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                          Data Entered
19
           dos.writeBoolean(true);
20
           dos.writeInt(2000);
                                                                                          Connection Created
21
22
           System.out.println("Data Entered");
23
           dos.close();
24
25
           DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
26
           System.out.println("\nConnection Created");
27
28
           System.out.println(dis.readInt());
29
            //System.out.println(dis.readChar());
30
            //System.out.println(dis.readBoolean());
31
            //System.out.println(dis.readInt());
32
33
           dis.close();
34
35
368
       public static void main(String[] args) throws Exception
37
38
           new ClassA() fileOperations():
                                                                                          <terminated> ClassA [Java Application] C:\Program File
16
                                                                                          Implementing DataStreams
17
            dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                          Data Entered
19
            dos.writeBoolean(true);
20
            dos.writeInt(2000);
                                                                                          Connection Created
21
                                                                                          1000
22
            System.out.println("Data Entered");
23
            dos.close();
24
25
            DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
26
            System.out.println("\nConnection Created");
27
28
            //System.out.println(dis.readInt());
29
            //System.out.println(dis.readChar());
30
            //System.out.println(dis.readBoolean());
31
            System.out.println(dis.readInt());
32
33
            dis.close();
34
35
                                                                                  T
       public static void main(String[] args) throws Exception
368
37
38
            new ClassA().fileOperations();
```

```
<terminated> ClassA [Java Application] C:\Program File:
                                                                                          Implementing DataStreams
17
            dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                         Data Entered
19
            dos.writeBoolean(true);
20
            dos.writeInt(2000);
                                                                                          Connection Created
21
                                                                                          1000
22
            System.out.println("Data Entered");
                                                                                         4260096
23
            dos.close();
24
25
            DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
26
            System.out.println("\nConnection Created");
27
28
            System.out.println(dis.readInt());
29
            System.out.println(dis.readInt());
30
            //System.out.println(dis.readChar());
31
            //System.out.println(dis.readBoolean());
32
33
34
            dis.close();
35
                                                                                  I
36
37€
        public static void main(String[] args) throws Exception
38
                                                                                          terminated> ClassA [Java Application] C:\Program File
16
                                                                                          Implementing DataStreams
17
            dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                          Data Entered
19
            dos.writeBoolean(true);
20
            dos.writeInt(2000);
                                                                                          Connection Created
22
            System.out.println("Data Entered");
                                                                                          4260096
23
            dos.close();
24
                                                                                          true
25
            DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
26
            System.out.println("\nConnection Created");
27
28
            System.out.println(dis.readInt());
29
            System.out.println(dis.readInt());
30
            System.out.println(dis.readChar());
31
            System.out.println(dis.readBoolean());
32
33
34
            dis.close();
35
36
37⊜
       public static void main(String[] args) throws Exception
38
```

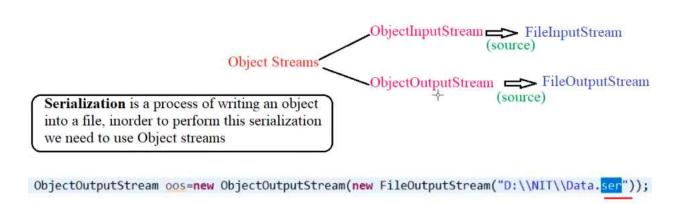
Whenever we are dealing with the data streams definitely, we should maintain order otherwise we will get inconsistent results.

```
<terminated> ClassA [Java Application] C:\Program Files\
                                                                                          Implementing DataStreams
17
            dos.writeInt(1000);
                                                                                          Connection Created
18
            dos.writeChar('A');
                                                                                          Data Entered
19
            dos.writeBoolean(true);
            dos.writeInt(2000);
                                                                                          Connection Created
21
22
                                                                                          1000
            System.out.println("Data Entered");
            dos.close();
24
25
           DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\
26
27
            System.out.println("\nConnection Created");
28
            System.out.println(dis.readInt());
29
30
            System.out.println(dis.readChar());
            System.out.println(dis.readBoolean());/
31
            System.out.println(dis.readInt());
32
33
34
            dis.close();
35
37⊕
       public static void main(String[] args) throws Exception
38
```

If we are talking about 100 variables then how can we remember the order, whenever we are dealing with datatype streams, we should go with one data type.

```
30 import java.io.DataInputStream;
4 import java.io.DataOutputStream;
5 import java.io.FileInputStream;
6 import java.io.FileOutputStream;
8 public class ClassA
9
109
       void fileOperations() throws Exception
11
12
           System.out.println("Implementing DataStreams");
13
14
           DataOutputStream dos=new DataOutputStream(new FileOutputStream("D:\\NIT\\file5.txt"));
15
           System.out.println("Connection Created");
16
17
           dos.writeInt(1000);
18
           dos.writeChar('A');
           dos.writeBoolean(true);
19
20
           dos.writeInt(2000);
21
22
           System.out.println("Data Entered");
23
           dos.close();
24
           DataInputStream dis=new DataInputStream(new FileInputStream("D:\\NIT\\file5.txt"));
25
           System.out.println("\nConnection Created");
```

```
27
28
           System.out.println(dis.readInt());
29
           System.out.println(dis.readChar());
30
           System.out.println(dis.readBoolean());
31
           System.out.println(dis.readInt());
32
33
            Whenever we are trying to retrieve the data from the file by using
34
            Data streams 100% we need to maintain the order the means in which
35
            order we have entered the data in the same order we should retrieve
            otherwise we will be getting inconsistent results
36
37
38
39
           dis.close();
40
       public static void main(String[] args) throws Exception
419
42
43
           new ClassA().fileOperations();
44
       }
45 }
```



When we are writing an object into a file the file extension must be in serializable

Understanding Serialization

- The process of saving (or) writing state of an object to a file is called serialization.
- In other words it is a process of converting an object from java supported version to network supported version (or) file supported version.

ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStream("File Path"));

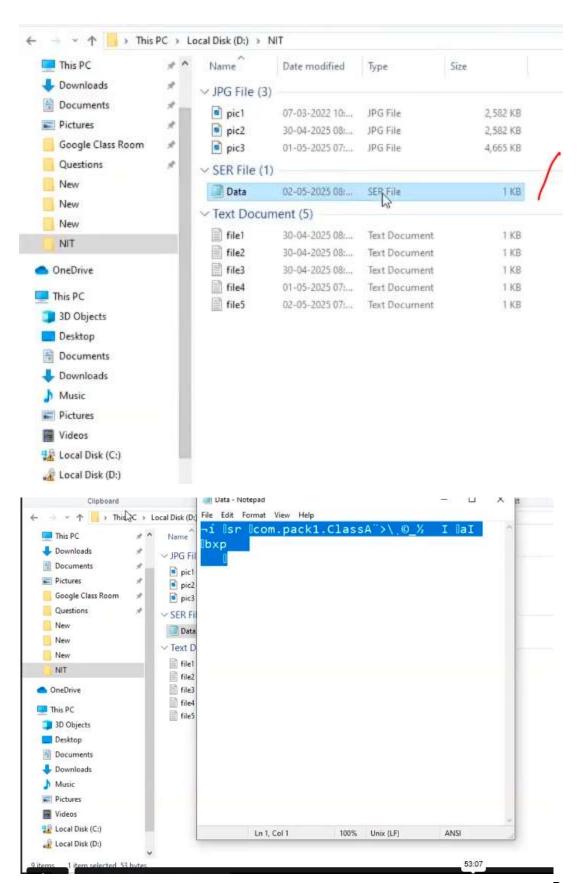
- By using FileOutputStream and ObjectOutputStream classes we can achieve serialization.
- The process of reading state of an object from a file is called DeSerialization.
- By using FileInputStream and ObjectInputStream classes we can achieve DeSerialization.

ObjectInputStream ois=new ObjectInputStream(new FileInputStream("File Path"));

Important Points to remember

- We can perform Serialization only for Serializable objects.
- An object is said to be Serializable if and only if the corresponding class implements Serializable interface.
- Serializable interface present in java.io package and does not contain any methods. It is marker interface. The required ability will be provided automatically by JVM.
- We can add any no. Of objects to the file and we can read all those objects from the file, but in which order we wrote objects in the same order only the objects will come back ie, reterving order is important.
- If we are trying to serialize a non-serializable object then we will get RuntimeException saying "NotSerializableException".

```
1 package com.pack1;
                                                                         package com.pack1;
   import java.io.Serializable;
                                                                       3 import java.io.FileOutputStream;
                                                                       4 import java.io.ObjectOutputStream;
   public class ClassA implements Serializable
 6
                                                                         public class ClassC
        int a=10;
 8
        int b=20;
                                                                             public static void main(String[] args) throws Exception
10
                                                                      10
                                                                                  System.out.println("Implementing Object Streams\n");
11
                                                                                  ClassA aobj1=new ClassA();
12
                                                                                  System.out.println("aobj1 : "+aobj1.a+" "+aobj1.b);
                                                                      14
ClassB.java ×
                                                                                  ObjectOutputStream oos=new ObjectOutputStream(new Fi
► 🔂 Training → 🕾 src → 🏦 com.pack1 → 🧿 ClassB
                                                                                  System.out.println("Connetion created");
 1 package com.pack1;
                                                                      17
                                                                                 oos.writeObject(aobj1);
System.out.println("Seriliazation completed");
                                                                      18
 3 public class ClassB
                                                                      19
 4 {
                                                                      20
                                                                                  oos.close();
 6
                                                                      22
                                                                      23
 8
                                                                      24
                                                                      25
10
   package com.pack1^=
                            package com.pack1;
                                                                                                             import java.io.Se
                           3⊕import java.io.FileOutputStream;
                                                                                                             Implementing Object Stream
                           4 import java.io.ObjectOutputStream;
   public class Clas
                                                                                                             aobj1 : 10 20
                            public class ClassC
                                                                                                             Connetion created
       int a=10;
                          88
                                 public static void main(String[] args) throws Exception
       int b=20;
9 }
                          9
10
                                     System.out.println("Implementing Object Streams\n");
11
                                     ClassA aobj1=new ClassA();
  <
                                     System.out.println("aobj1 : "+aobj1.a+" "+aobj1.b);
                         14
🥦 ▶ 🌁 ▶ 🔠 ▶ 😉 ClassB
                                     {\tt ObjectOutputStream\ oos=} {\color{red} new\ ObjectOutputStream} ({\color{red} new\ FileOutputStream}) \\
1 package com.pack1^
                                     System.out.println("Connetion created");
   public class Clas
                                     oos.writeObject(aobj1);
                                     System.out.println("Seriliazation completed");
                                     oos.close();
6
                       22 }
```



```
public static void main(String[] args) throws Exception
 1 package com.pack1^=
                                                                                                            ^ - - -
   import java.io.Se
                                      System.out.println("Implementing Object Streams\n"):
                                                                                                               Implementing Object Stream
                                      ClassA aobj1=new ClassA();
   public class Clas
                                                                                                               aobj1 : 10 20
                                      System.out.println("aobj1 : "+aobj1.a+" "+aobj1.b);
                                                                                                               Connetion created
        int a=10:
                                                                                                               Seriliazation completed
 8
        int b=20:
                                      ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStrea
 9 }
                                      System.out.println("Connetion created");
                                                                                                               Connetion created
10
                                                                                                               aobj2: 10 20
                                      oos.writeObject(aobj1);
11
                                      System.out.println("Seriliazation completed");
                                      oos.close();

☑ ClassB.java ×
□ → 😇 → 🛅 → G ClassB
                                      ObjectInputStream ois=new ObjectInputStream(new FileInputStream("
 1 package com.pack1^
                                      System.out.println("\nConnetion created");
   public class Clas
                                      ClassA aobj2=(ClassA)ois.readObject();
System.out.println("aobj2 : "+aobj2.a+" "+aobj2.b);
                          31 }
```

De-serialization

Retrieving the object from a file

Can we pass multiple objects into file?

```
☑ ClassA.java ×
                                                  ClassC.java ×
> 🔀 Training > 🚇 src > 🔠 com.pack1 > 🗩 ClassA >
                                                  ▶ 😂 Training ▶ 📇 src ▶ 🏭 com.pack1 ▶ 🥥 ClassC ▶ 🗳 main(String[]) : void
                                                                                                                                1 package com.pack1;
                                                                ObjectOutputStream oos=new ObjectOutputStream(new Fi
                                                                                                                                <terminated > ClassC [Java Application] C:
    import java.io.Serializable;
                                                                System.out.println("Connection created");
                                                                                                                                Implementing Object S
     public class ClassA implements Seri
                                                                oos.writeObject(bobj1);
                                                                                                                                aobj1 : 10 20
                                                               oos.writeObject(aobj1);
                                                                                                                                Connetion created
         int a=10:
                                                                                                                                Seriliazation complet
         int b=20:
                                                                System.out.println("Seriliazation completed");
                                                                                                                               Connetion created
                                                               oos.close();
                                                                                                                                aobj2: 10 20
☑ ClassB.java ×
                                                               ObjectInputStream ois=new ObjectInputStream(new File
> 🔛 Training > 🌁 src > 🔠 com.pack1 > ⊖ ClassB > △ y:int
                                                                System.out.println("\nConnetion created");
  1 package com.pack1;
                                                               ClassA aobj2=(ClassA)ois.readObject();
    public class ClassB
                                                   33
                                                               ClassB bobj2=(ClassB)ois.readObject();
         int x=111;
                                                               System.out.println("aobj2 : "+aobj2.a+" "+aobj2.b);
System.out.println("bobj2 : "+bobj2.x+" "+bobj2.y);
int y=222;
                                                   36
                                                   38
                                                   40
                                                   41 }
                                                  42
 13
                                                   43
 14
                                                                                                       38:21:1116
```

```
ClassC.java ×
                                                                    Console X
                                                                                                                 D) ClassA.iava ×
                                                → 🍪 → 😕 → 😘 → Q → of m <terminated> ClassC [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (02-May-2025, 8:32-49 am – 8:32:50 am) [pid:
> 🤛 Training > 💯 src > 🖽 com.pack1 > 😥 ClassA >
                                                                      reams
  1 package com.pack1;
                                                119
                                                 20
                                                             Objec
   3 import java.io.Serializable;
                                                             Syst€
  5 public class ClassA implements Seri
                                                             005.V
                                                                      ain" java.io.NotSerializableException: com.pack1.ClassB I
                                                 24
  6 {
                                                             005.V
                                                                      ava.io.ObjectOutputStream.writeObject0(ObjectOutputStream.java:1197)
         int a=10:
                                                                      ava.io.ObjectOutputStream.writeObject(ObjectOutputStream.java:354)
                                                             Syste
         int b=20:
                                                                      m.pack1.ClassC.main(ClassC.java:23)
                                                             005.0
☑ Class8.java ×
                                                             Object
> 🔀 Training > 🕮 src > 🔠 com.pack1 > 😉 ClassB > 4 y : int
                                                             Syste
  1 package com.pack1;
                                                             Class
  3 public class ClassB
                                                             Class
  4 {
         int x=111;
                                                             Syste
         int y=222;
                                                 36
                                                             Syste
  7 }
                                                 37
                                                 38
                                                             ois.
                                                 39
 10
                                                 40
                                                         }
 11
                                                 41 }
 12
                                                42
 13
                                               43
 14
ClassA.iava X
                                                                                   (i) ClassC.iava ×
```

```
> 🧺 Training → 🕮 src → 🗿 com.pack1 → 🧖 ClassC → 💣 main(String[]) : void
> 🔝 Training > 🎏 src > 🗯 com.pack1 > 😥 ClassA >
                                                                                       19
  1 package com.pack1;
                                                                                                     ObjectOutputStream oos=new ObjectOutputStream
  3 import java.io.Serializable;
                                                                                                     System.out.println("Connection created");
  5 public class ClassA implements Serializable
                                                                                                     oos.writeObject(bobj1);
  6 {
                                                                                        24
                                                                                                     oos.writeObject(aobj1);
         int a=10;
                                                                                                     System.out.println("Seriliazation completed")
  8
         int b=20;
                                                                                                     oos.close();
ObjectInputStream ois=new ObjectInputStream(r
System.out.println("\nConnetion created");
> 🔛 Training > 🥶 src > 🔠 com.pack1 > ⊖ Class8 >
  1 package com.pack1;
                                                                                        31
                                                                                        32
                                                                                                     ClassA aobj2=(ClassA)ois.readObject();
 3 import java.io.Serializable;
                                                                                                     ClassB bobj2=(ClassB)ois.readObject();
                                                                                        34
5 public class ClassB implements Serializa
                                                                                                     System.out.println("aobj2 : "+aobj2.a+" "+aob
System.out.println("bobj2 : "+bobj2.x+" "+bob
  6 {
          int x=111;
         int y=222;
                                                                                        38
                                                                                                     ois.close();
  9 }
                                                                                        39
 10
                                                                                        40
 11
                                                                                     41 }
```

```
ClassA.java X
                                                                                                                 ClassC.java ×
                                                        <terminated> ClassC [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (02-May-2025, 8:33:27 am - 8:33:27 am) [pid: 976]
トラト: ● ト: # ト 9 ト A a:int
                              > 😅 > 🕮 > 排 → Q → e main(Str
                                                        Implementing Object Streams
  1 package com.pack1;
                                           ObjectOu
                                                        aobj1 : 10 20
  3 import java.io.Seria
                                            System.o
                                                        bobj1: 111 222
                                                        Connection created
5 public class ClassA
                                            oos.writ
                                                        Seriliazation completed
                                           oos.writ
                                                        Connetion created
         int b=20;
                                            System.
                                                        Exception in thread "main" java.lang.ClassCastException: class com.pack1.ClassB
  9 }
                                            oos.clos
                                                                 at Training/com.pack1.ClassC.main(ClassC.java:32)
    <
                                            ObjectIn
☐ ClassB.java ×
                                            System.o
> 25 > 25 > 35 > 15 ClassB >
  1 package com.pack1;
                                           ClassA a
                                            ClassB b
  3 import java.io.Seria
                                            System.
  5 public class ClassB
                                            System.o
  6 {
         int x=111:
                                           ois.clos
         int y=222;
 10
                                41 }
 11
                               42
 12
```

Because of the order

```
    ClassC.java 

    X
    ClassC.java 
    X
    ClassC.java 
    X
    ClassC.java 
    X
    ClassC.java 
    X
    ClassC.java 
    X
    ClassC.java 
    X
    ClassC.java 
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    ClassC.java 
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   ClassC.java 
    X
    Cl
  > 5 + 5 + 1 + 1 + 1 + 4 a:int
                                                                                                                                                                           > 🚰 Training > 💯 src > 🔠 com.pack1 > 🖳 ClassC > 💣 main(String[]) : void
             1 package com.pack1;
                                                                                                                                                                                                                                                  ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStream("D:\\NIT\\Data.ser"));
                                                                                                                                                                                                                                                  System.out.println("Connection created");
             3 import java.io.Seria
5 public class ClassA
                                                                                                                                                                                                                                                 oos.writeObject(bobj1); <
                                                                                                                                                                                                                                                oos.writeObject(aobj1);
                                                    int a=10;
                                                   int b=20;
                                                                                                                                                                                                                                                  System.out.println("Seriliazation completed");
            9 }
                                                                                                                                                                                                                                                oos.close();
                          <
                                                                                                                                                                                                                                                  ObjectInputStream ois=new ObjectInputStream(new FileInputStream("D:\\NIT\\Data.ser"));

    ClassB.java 

    X
    ✓
    ClassB.java 
    X
    ✓
    ClassB.java 
    X
    ✓
    ClassB.java 
    X
    ✓
    ClassB.java 
    X
    X
    ClassB.java 
    X
    ClassB.java 
    X
    ClassB.java 
    X
    ClassB.java 
    X
    ClassB.java 
    X
    Class
                                                                                                                                                                                                                                                  System.out.println("\nConnetion created");
  > 2 → 25 → 28 → 19 ClassB →
              1 package com.pack1;
                                                                                                                                                                                                                                                  ClassA aobj2=(ClassA)ois.readObject();/
                                                                                                                                                                                                                                                  ClassB bobj2=(ClassB)ois.readObject();
                          import java.jo.Serja
                                                                                                                                                                                                                                                 System.out.println("aobj2 : "+aobj2.a+" "+aobj2.b);
System.out.println("bobj2 : ["+bobj2.x+" "+bobj2.y);
             5 public class ClassB
            6 {
                                                     int x=111;
                                                                                                                                                                                38
                                                                                                                                                                                                                                                  ois.close();
                                                   int y=222:
            9 }
                                                                                                                                                                                                                         }
      10
                                                                                                                                                                              41 }
       11
                                                                                                                                                                               42
    12
```

```
D) ClassA.iava X
                                                        ClassC.iava X
 ▶ 😸 Training ▶ 🍠 src ▶ 🔠 com.pack1 ▶ 🤮 ClassC ▶ 💣 main(String[]) : void
     1 package com.pack1;
                                                                               ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStream("D:\\NIT\\Data.ser"));
                                                                               System.out.println("Connection created");
     3 import java.io.Seria
    5 public class ClassA
                                                                               oos.writeObject(bobj1);
int a=10;
                                                                               System.out.println("Seriliazation completed");
                 int b=20;
  9 }
                                                                              oos.close();
        <
                                                                               ObjectInputStream ois=new ObjectInputStream(new FileInputStream("D:\\NIT\\Data.ser"));
 System.out.println("\nConnetion created");
 > 5 > 5 > 1 ClassB >
     1 package com.pack1;
                                                                               ClassA aobj2=(ClassA)ois.readObject();
                                                                              ClassB bobj2=(ClassB)ois.readObject();
     3 import java.io.Seria
                                                                               System.out.println("aobj2 : "+aobj2.a+" "+aobj2.b);
     5 public class ClassB
                                                                               System.out.println("bobj2: "+bobj2.x+" "+bobj2.y);
                 int x=111;
                                                                               ois.close();
                 int y=222;
                                                          39
    9 }
                                                         41 }
  11
                                                         42
☐ ClassA.java ×

    ClassC.java 

    X
    ClassC.java 
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    ClassC.java 
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    ClassC.java 
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    ClassC.java 
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    ClassC.java 
    ClassC.j
                                                                                                                                                                   Console X
                                                                                                                                                                 <terminated> ClassC [Java Application] C:\Program Files\Java
> 😕 > 🕮 > 唐 > ⑨ + △ a:int
                                                                                        > 😂 > 🕮 > № A P 😭 > 📽 main(Str
                                                                                                                                                                  Implementing Object Streams
     1 package com.pack1;
                                                                                           19
                                                                                          20
                                                                                                                             ObjectOu
                                                                                                                                                                  aobj1 : 10 20
           import java.io.Seria
                                                                                          21
     3
                                                                                                                             System.o
                                                                                                                                                                  bobj1 : 111 222
                                                                                          22
     4
                                                                                                                                                                  Connection created
                                                                                          23
    5
           public class ClassA
                                                                                                                             oos.writ
                                                                                                                                                                  Seriliazation completed
                                                                                          24
     6
                                                                                                                             oos.writ
     7
                                                                                          25
                        int a=10;
                                                                                                                                                                   onnetion created
                                                                                                                             System.o
     8
                        int b=20;
                                                                                          26
                                                                                                                                                                   aobj2 : 10 20
     9
                                                                                          27
                                                                                                                             oos.clos
                                                                                                                                                                   bobj2 : 111 222
  30
                                                                                          28
                                                                                          29
                                                                                                                             ObjectIn
ClassB.java X
                                                                                          30
                                                                                                                             System.o
> 😥 > 🕮 > 📠 > 🗩 ClassB >
                                                                                           31
     1 package com.pack1;
                                                                                          32
                                                                                                                             ClassA a
     2
                                                                                          33
                                                                                                                             ClassB b
            import java.io.Seria
                                                                                          34
     4
                                                                                          35
                                                                                                                             System.c
     5
           public class ClassB
                                                                                          36
                                                                                                                             System.c
     6
                                                                                          37
     7
                        int x=111;
                                                                                          38
                                                                                                                             ois.clos
     8
                        int y=222;
                                                                                          39
     9
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                                                                                                                }
  10
                                                                                         41 }
  11
```

42

43

12

if we are declaring any variable as transient, if we are performing serialization, JVM will ignore the original value of that variable and only the default value of that variable is stored.

Transient key word is used for only variables not for methods

Transient keyword

- 'transient' is the modifier applicable only for variables.
- While performing serialization if we don't want to save the value of a particular variable to meet security constraints such type of variable, then we should declare that variable with "transient" keyword.
- At the time of serialization JVM ignores the original value of transient variable and save default value to the file.

```
J) ClassA.iava X
                                              J) ClassC.iava X
                                                                                                 Console X
                                                                                                                 川 其 後 法
                                                                                                <terminated> ClassC [Java Application] C:\Program
▶ 🎏 ▶ 💯 src ▶ 🔠 com.pack1 ▶ 👂 ClassA ▶ 🐴 a : int
                                              > 😅 > 🕮 src > 🏭 com.pack1 → 🗣 ClassC > 💣 main(String[]) : void
                                                                                                Implementing Object Streams
  1 package com.pack1;
                                              19
                                               20
                                                           ObjectOutputStream oos=new Ob
                                                                                                aobj1 : 10 20
  3 import java.io.Serializable;
                                               21
                                                           System.out.println("Connection
                                                                                                bobj1: 111 222
                                              22
  4
                                                                                                Connection created
5 public class ClassA implements S
                                               23
                                                           oos.writeObject(aobj1);
                                                                                                Seriliazation completed
  6 {
                                               24
                                                           oos.writeObject(bobj1);
  7
         transient int a=10;
                                                                                                Connetion reated
                                                           System.out.println("Seriliaza"
  8
         int b=20;
                                                                                                aobj2 : 0 20
bobj2 : 111 222
  9 }
                                               27
                                                           oos.close();
                                               28
 10
     <
                                               29
                                                           ObjectInputStream ois=new Obje
                                                           System.out.println("\nConnetic

☑ ClassB.java ×
                                               30
                                               31
> 1 Training > 2 src > 3 com.pack1 > 9 Class8 >
                                                           ClassA aobj2=(ClassA)ois.read(
  1 package com.pack1;
                                                           ClassB bobj2=(ClassB)ois.read
                                                                                                        Ι
                                               34
  3 import java.io.Serializable;
                                               35
                                                           System.out.println("aobj2 : ".
  4
                                                           System.out.println("bobj2 : "-
                                               36
  5 public class ClassB implements S
                                               37
  6 {
         int x=111;
                                               38
                                                           ois.close();
                                               39
  8
         int y=222;
  9 }
                                               40
                                               41 }
 10
                                              42
 11
 12
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     <
                                                                                         1-02-21
```

```
☐ ClassA.iava ×
                                                            ClassC.iava X
> 🔛 Training > 💯 src > 👭 com.pack1 > 🗩 ClassA > 💪 a: int
                                                            > 🔛 Training > 💯 src > 🗿 com.pack1 > 🝳 ClassC > 💣 main(String[]) : void
  1 package com.pack1;
                                                              1 package com.pack1;
  3 import java.io.Serializable;
                                                              3 import java.io.FileInputStream;
                                                              4 import java.io.FileOutputStream;
5 public class ClassA implements Serializable
                                                              5 import java.io.ObjectInputStream;
  6 {
                                                              6 import java.io.ObjectOutputStream;
  7
         transient int a=10;
  8
         int b=20;
                                                              8
                                                                 public class ClassC
 9 }
                                                              9
                                                                 {
                                                                     public static void main(String[] args) throws Exception
 10
                                                             10=
                                                                         System.out.println("Implementing Object Streams\n");

    ClassB.java 

    X

                                                             13
> 🚰 Training > 📇 src > 🔠 com.pack1 > 😥 ClassB >
                                                             14
                                                                         ClassA aobj1=new ClassA();
  1 package com.pack1;
                                                                         ClassB bobj1=new ClassB();
                                                             16
    import java.io.Serializable;
                                                             17
                                                                          System.out.println("aobj1 : "+aobj1.a+" "+aobj1.b);
                                                             18
                                                                         System.out.println("bobj1 : "+bobj1.x+" "+bobj1.y);
  5 public class ClassB implements Serializable
                                                             19
  6 {
                                                                         ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStr
                                                             20
         int x=111;
                                                                          System.out.println("Connection created");
  8
         int y=222;
                                                             22
  9
                                                             23
                                                                         oos.writeObject(aobj1);
 10
                                                             24
                                                                         oos.writeObject(bobj1);
 11
```

```
3 import java.io.FileInputStream;
4 import java.io.FileOutputStream;
5 import java.io.ObjectInputStream;
6 import java.io.ObjectOutputStream;
8 public class ClassC
9 {
       public static void main(String[] args) throws Exception
100
11
12
           System.out.println("Implementing Object Streams\n");
13
14
           ClassA aobj1=new ClassA();
           ClassB bobj1=new ClassB();
15
16
           System.out.println("aobj1 : "+aobj1.a+" "+aobj1.b);
17
           System.out.println("bobj1 : "+bobj1.x+" "+bobj1.y);
18
19
20
           ObjectOutputStream oos=new ObjectOutputStream(new FileOutputStream("D:\\NIT\\Data.ser"));
21
           System.out.println("Connection created");
22
23
           oos.writeObject(aobj1);
24
           oos.writeObject(bobj1);
25
26
           System.out.println("Seriliazation completed");
27
           oos.close():
28
29
            ObjectInputStream ois=new ObjectInputStream(new FileInputStream("D:\\NIT\\Data.ser"));
30
            System.out.println("\nConnetion created");
31
32
            ClassA aobj2=(ClassA)ois.readObject();
33
            ClassB bobj2=(ClassB)ois.readObject();
34
35
            System.out.println("aobj2: "+aobj2.a+" "+aobj2.b);
36
            System.out.println("bobj2: "+bobj2.x+" "+bobj2.y);
37
38
            ois.close();
39
40
       }
41 }
```