St. Francis Institute of Technology, Mumbai-400 103

Department Of Information Technology

A.Y. 2023-2024

Class: SE-ITA/B, Semester: III

Subject: **Java Labs**

Experiment 10

Aim: Write a program to demonstrate IO stream in java .

i) Write a program in java using **FileInputStream, FileOutputStream** class to read/ write the file

ii) Write a program in java using **BufferedInputStream, BufferedOutputStream** class to read/write the file

iii) Write a program in java using **ByteArrayInputStream** class to read /write the file

2. Prerequisite: Knowledge creating and using packages in Java.

3. Requirements: Personal Computer (PC), Windows Operating System, JDK 1.8 and above,online java compiler/IDE.

4. Pre-Experiment Exercise:

Theory:

Java I/O (Input and Output) is used *to process the input* and *produce the output*.

Java uses the concept of a stream to make I/O operation fast. The java.io package contains all the classes required for input and output operations.

We can perform **file handling in Java** by Java I/O API.

Stream

A stream is a sequence of data. In Java, a stream is composed of bytes. It's called a stream because it is like a stream of water that continues to flow.

In Java, 3 streams are created for us automatically. All these streams are attached with the console.

1) System.out: standard output stream

2) System.in: standard input stream

3) System.err: standard error stream

OutputStream

Java application uses an output stream to write data to a destination; it may be a file, an array, peripheral device or socket.

InputStream

Java application uses an input stream to read data from a source; it may be a file, an array, peripheral device or socket.

Let's understand the working of Java OutputStream and InputStream by the figure given below.

OutputStream class

OutputStream class is an abstract class. It is the superclass of all classes representing an output stream of bytes. An output stream accepts output bytes and sends them to some sink.

Useful methods of OutputStream

| Method	Description
1) public void write(int)throws IOException	is used to write a byte to the current output stream.
2) public void write(byte[])throws IOException	is used to write an array of byte to the current output stream.
3) public void flush()throws IOException	flushes the current output stream.
4) public void close()throws IOException	is used to close the current output stream.

OutputStream Hierarchy
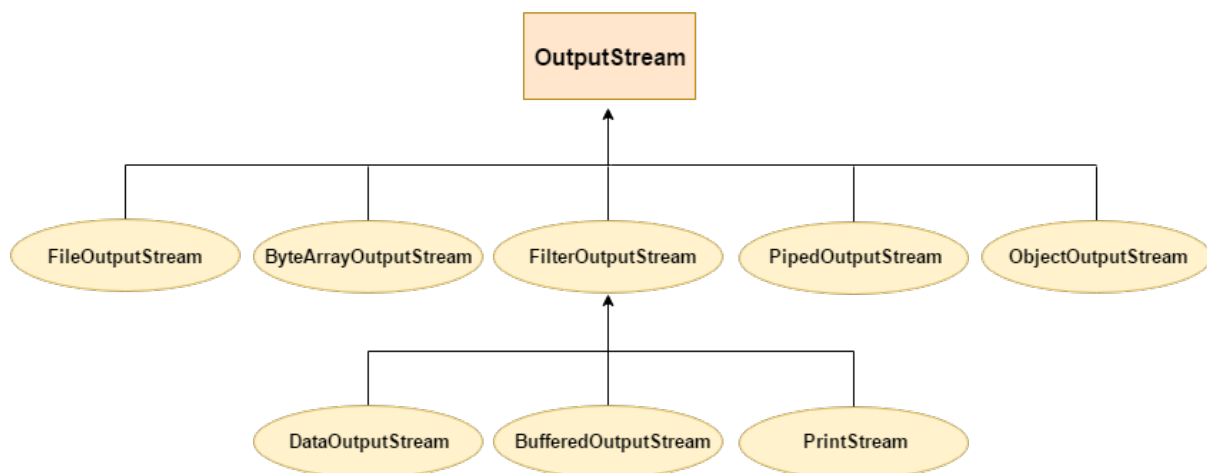
InputStream class

InputStream class is an abstract class. It is the superclass of all classes representing an input stream of bytes.

Useful methods of InputStream

Method	Description
1) public abstract int read()throws IOException	reads the next byte of data from the input stream. It returns -1 at the end of the file.
2)public int available() throws IOException	returns an estimate of the number of bytes that can be read from the current input stream.
3) public void close()throws IOException	is used to close the current input stream.

InputStream Hierarchy
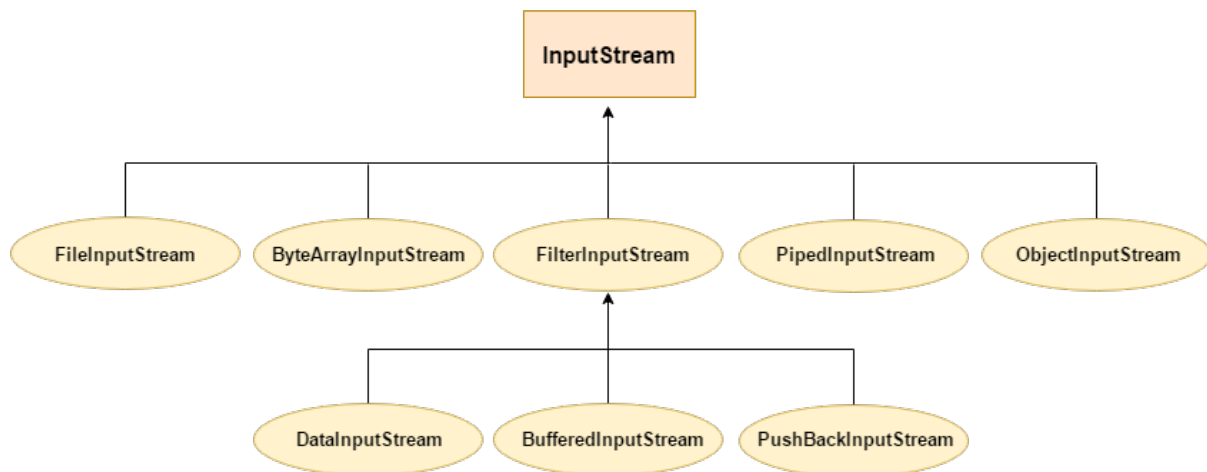
5. Laboratory Exercise

A. Procedure

i. Open Notepad++.

ii. Type the code and save it.

iii. Open cmd and explore till the folder where the code resides..

iv. To compile the code use :javac classname.java

v. To run the code use:java.classname

6. Post-Experiments Exercise

A. Extended Theory:

1. Explain FileInputStream and FileOutputStream class methods

2. write BufferedInputStream, BufferedOutputStream class methods

3. When does java.io.FileNotFoundException: (Access is denied) comes? How do you fix that?

4. How do you convert an InputStream to ByteArray in Java?

B. Questions/Programs:

1. You have been given the list of the names of the files in a directory. You have to select Java files from them. A file is a Java file if it's name ends with ".java". For e.g. File-"Names.java" is a Java file, "FileNames.java.pdf" is not. Input: test.java, ABC.doc, Demo.pdf, add.java, factorial.java, sum.txt Output: tset.java, add.java, factorial.java

C. Conclusion:

1. Write what was performed in the experiment/program.

2. Mention few applications of what was studied.

D. References

1. Balguruswamy, "Programming with java A primer", Fifth edition, Tata McGraw Hill Publication. 2. Let Us Java-Yashwant Kanetkar.

3. Learn to Master JAVA, from Star EDU solutions , by ScriptDemics.

4. Java 8 Programming-Black Book,by-Dreamtech Publications.

5. https://www.scaler.com/topics/java/java-io-streams/