File IO in Java

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AGENDA

Understanding Streams

Streams

Files

File class methods

File class methods -Cont

Programs using File class

Program to rename a file.

Program to delete a file.

Types of Streams

Stream Base IO

Overview of IO Classes

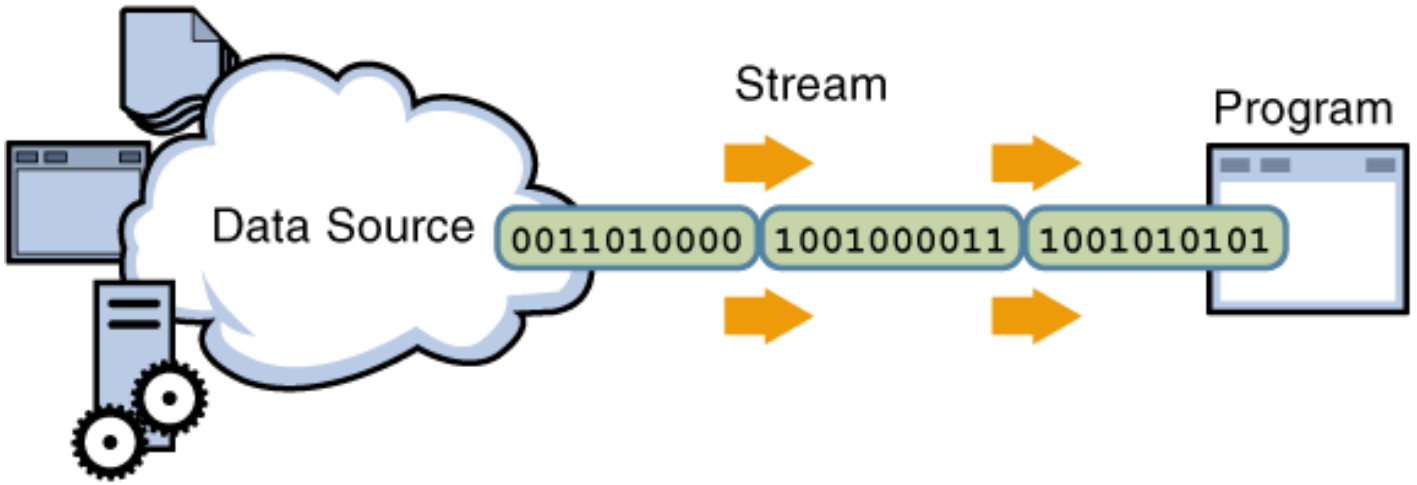
OutputStream of IO

InputStream of IO

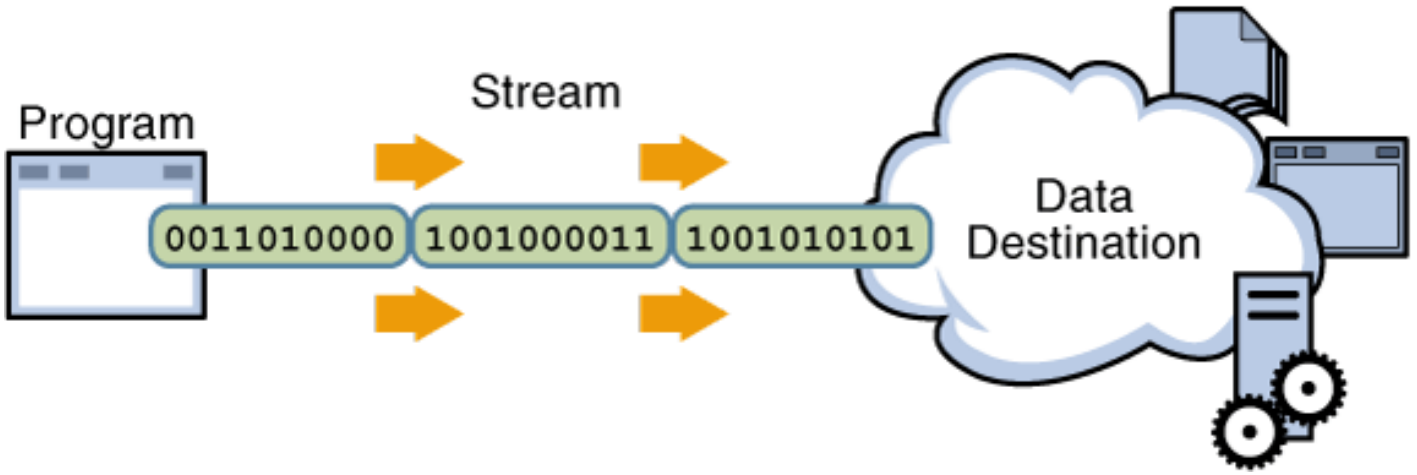
Writer of IO

Reader of IO

Understanding Streams



Input Stream



Output Stream

Streams

- Sequence of bytes.
- **Input Stream** : Data is received by some device to program.
- **Output Stream** : Data is sent by the program to device.
- Stream provides a sort of abstraction.
- Recall System.out and System.in
- System.in object of InputStream and System.out and System.err is object of PrintStream class.

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Files

- `File` class is provided by `java.io` package.
- An abstract reprsentation of file and directory pathnames.
- **Note** `File` object is not for reading / writing files.
- Used for obtaining information associated with file like permission, time and date, path.
- Directory too is treated as file and have additional method `list()` to list the filename in directory.
- ```
  public File(String pathname)
  public File(String parent, String child)
  public File(File parent, String child)
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File class methods

- `boolean canRead()`
- `boolean canWrite()`
- `boolean cancreateNewFile()`
- `boolean delete()`
- `boolean exists()`
- `String getAbsolutePath()`
- `String getName()`
- `String getParent()`
- `String getPath()`
- `boolean isAbsolute()`
- `boolean isDirectory()`
- `boolean isFile()`
- `boolean isHidden()`
- `long lastModified()`
- `long length()`

File class methods -Cont

- `String[] list()`
- `File[] listFiles()`
- `boolean mkdir()`
- `boolean renameTo(File d)`
- `boolean setLastModifiedDate()`
- `boolean setReadOnly()`
- `String toString()`
- `String getFreeSpace()`
- `String getTotalSpace()`
- `String getUsableSpace()`

Programs using File class

- Program to rename a file.

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- Traversing a Directory.

Programs using File class

- Program to rename a file.
- Program to delete a file.
- Creating a directory.
- Traversing a Directory.
- Using FilenameFilter Interface.

Program to rename a file.

```
import java.io.*;
import java.util.Scanner;
public class Rename
{
public static void main(String args[]) {
  File f1, f2;
  Scanner s = new Scanner(System.in);
  System.out.println("Enter the file name :  ");
  String name_old = s.nextLine();
  System.out.println("Enter the new name :  ");
  String name_new = s.nextLine();
  f1 = new File(name_old);
  f2 = new File(name_new);
  if(f1.renameTo(f2))
    System.out.println("File renamed");
  else
    System.out.println("Error Occured");
}
```

Program to delete a file.

```
import java.io.*;
import java.util.Scanner;
public class Rename
{
public static void main(String args[]) {
  File f1;
  Scanner s = new Scanner(System.in);
  System.out.println("Enter the file name :  ");
  String name = s.nextLine();
  f1 = new File(name);
  if(f1.exists())
  {
    if(f1.delete())
      System.out.println("File deleted");
    else
      System.out.println("Error Occured");
  }
}
```

Types of Streams

- Byte Stream / Binary Stream
  - Only Binary data / bytes.
  - Read and Write [8 bytes].
- Character Stream
  - Character Data.
  - Unicode Character.

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Stream Base IO

- Four Abstract Classes.
- Byte Stream / Binary Stream
  - InputStream.
  - OutputStream.
- Character Stream
  - Reader.
  - Writer.

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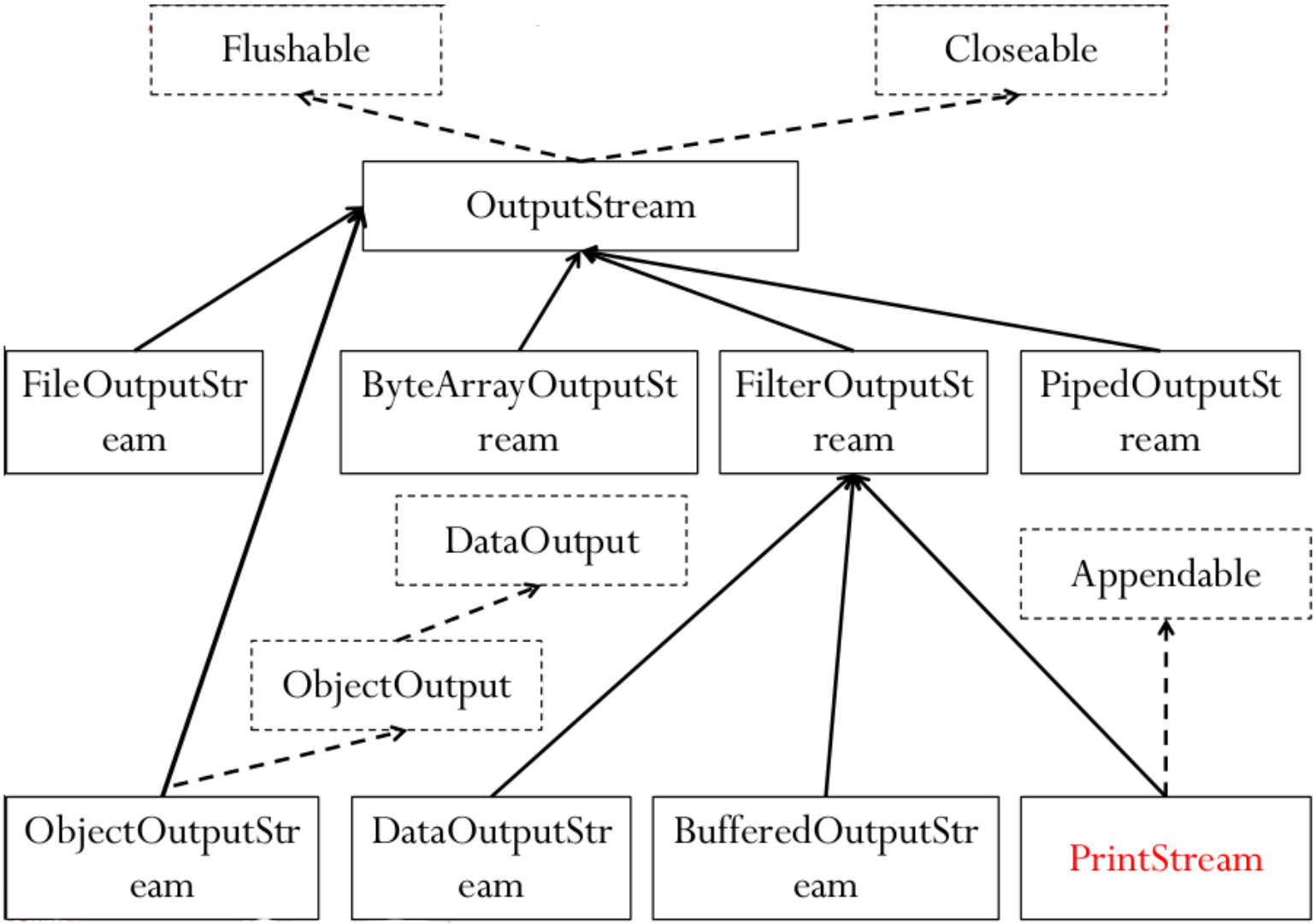
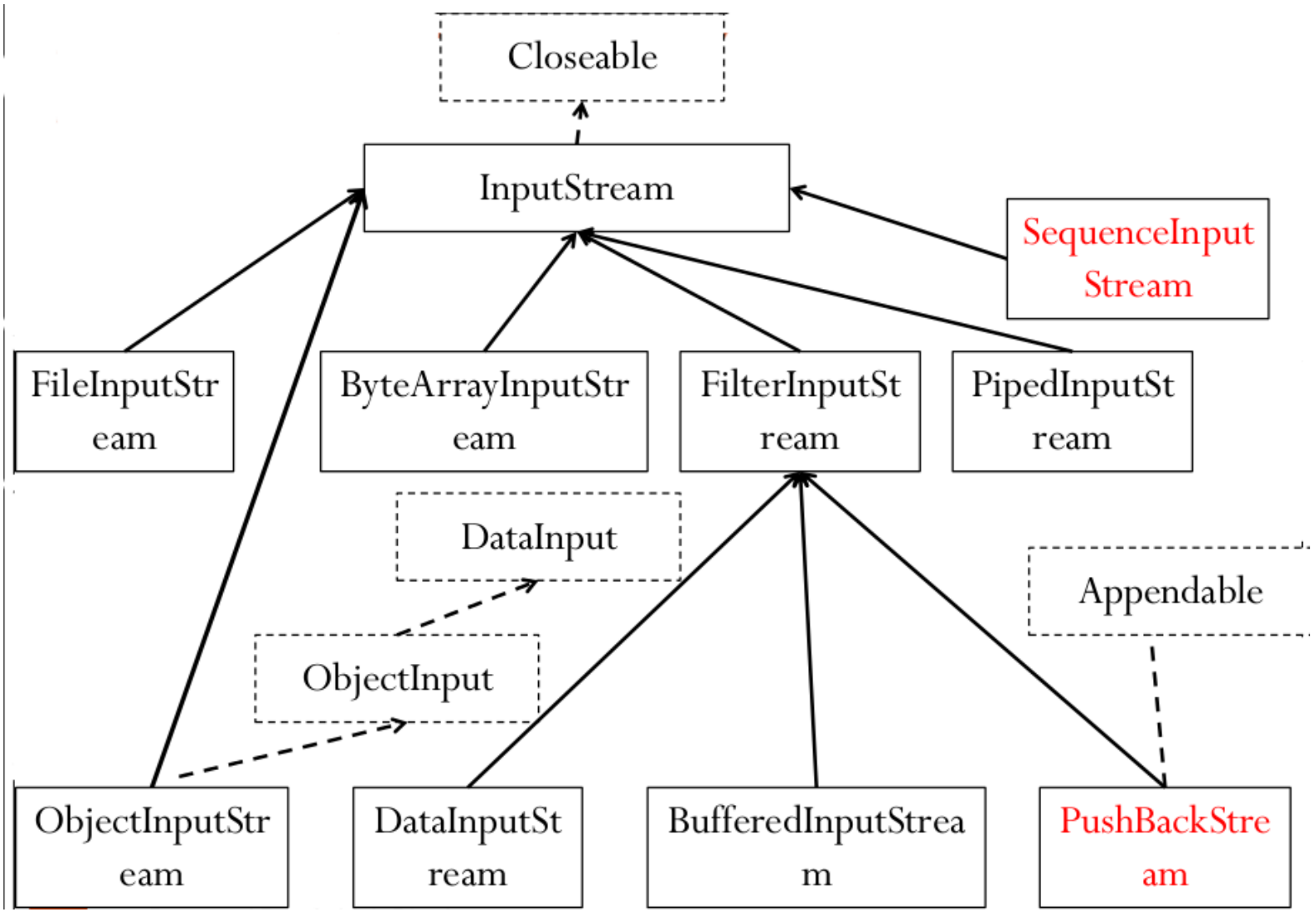
Overview of IO Classes

	Byte Based		Character Based	
	Input	Output	Input	Output
Basic	InputStream	OutputStream	Reader InputStreamReader	Writer OutputStreamWriter
Arrays	ByteArrayInputStream	ByteArrayOutputStream	CharArrayReader	CharArrayWriter
Files	FileInputStream RandomAccessFile	FileOutputStream RandomAccessFile	FileReader	FileWriter
Pipes	PipedInputStream	PipedOutputStream	PipedReader	PipedWriter
Buffering	BufferedInputStream	BufferedOutputStream	BufferedReader	BufferedWriter
Filtering	FilterInputStream	FilterOutputStream	FilterReader	FilterWriter
Parsing	PushbackInputStream StreamTokenizer		PushbackReader LineNumberReader	
Strings			StringReader	StringWriter
Data	DataInputStream	DataOutputStream		
Data - Formatted		PrintStream		PrintWriter
Objects	ObjectInputStream	ObjectOutputStream		
Utilities	SequenceInputStream			

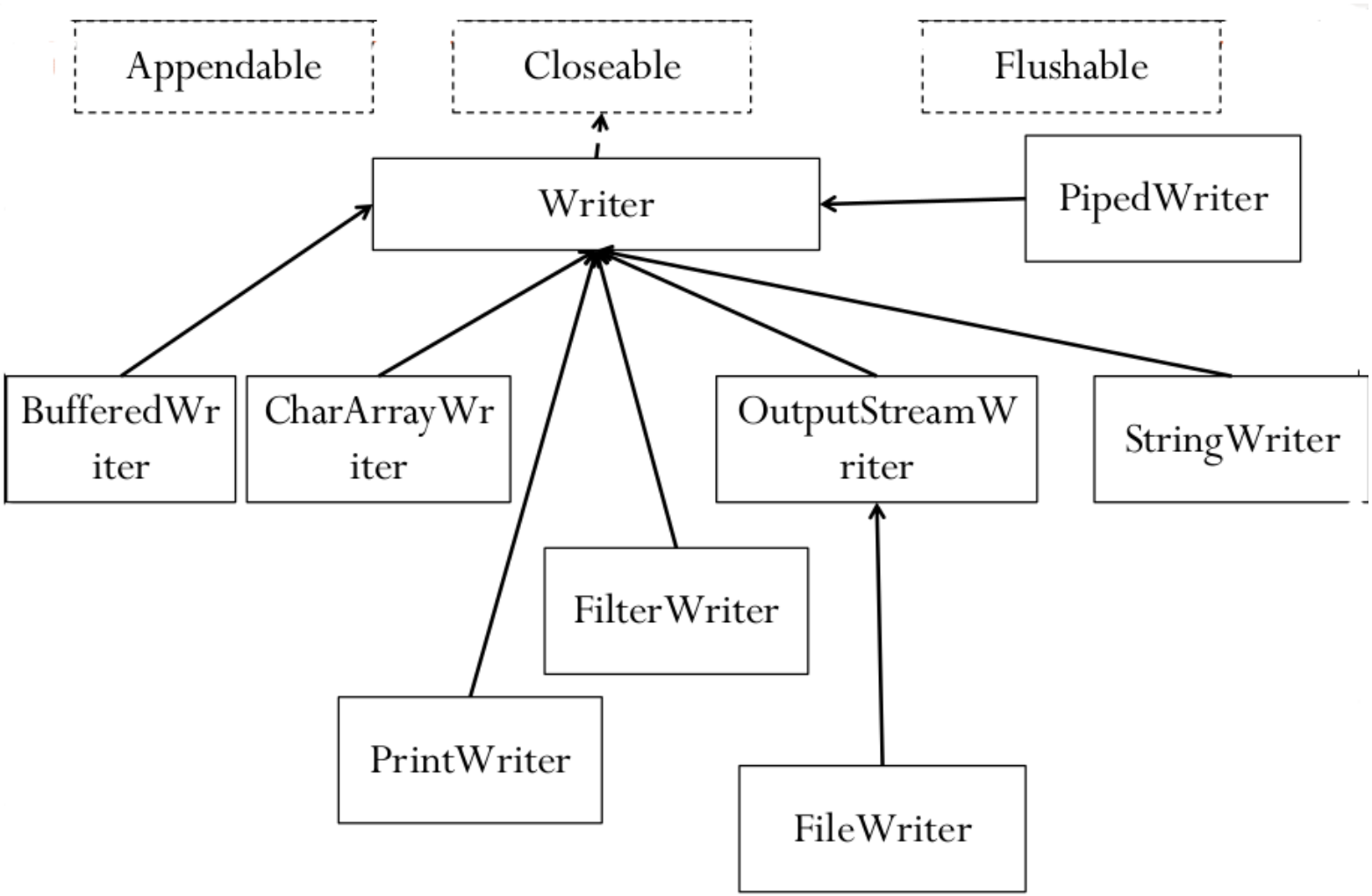
OutputStream of IO



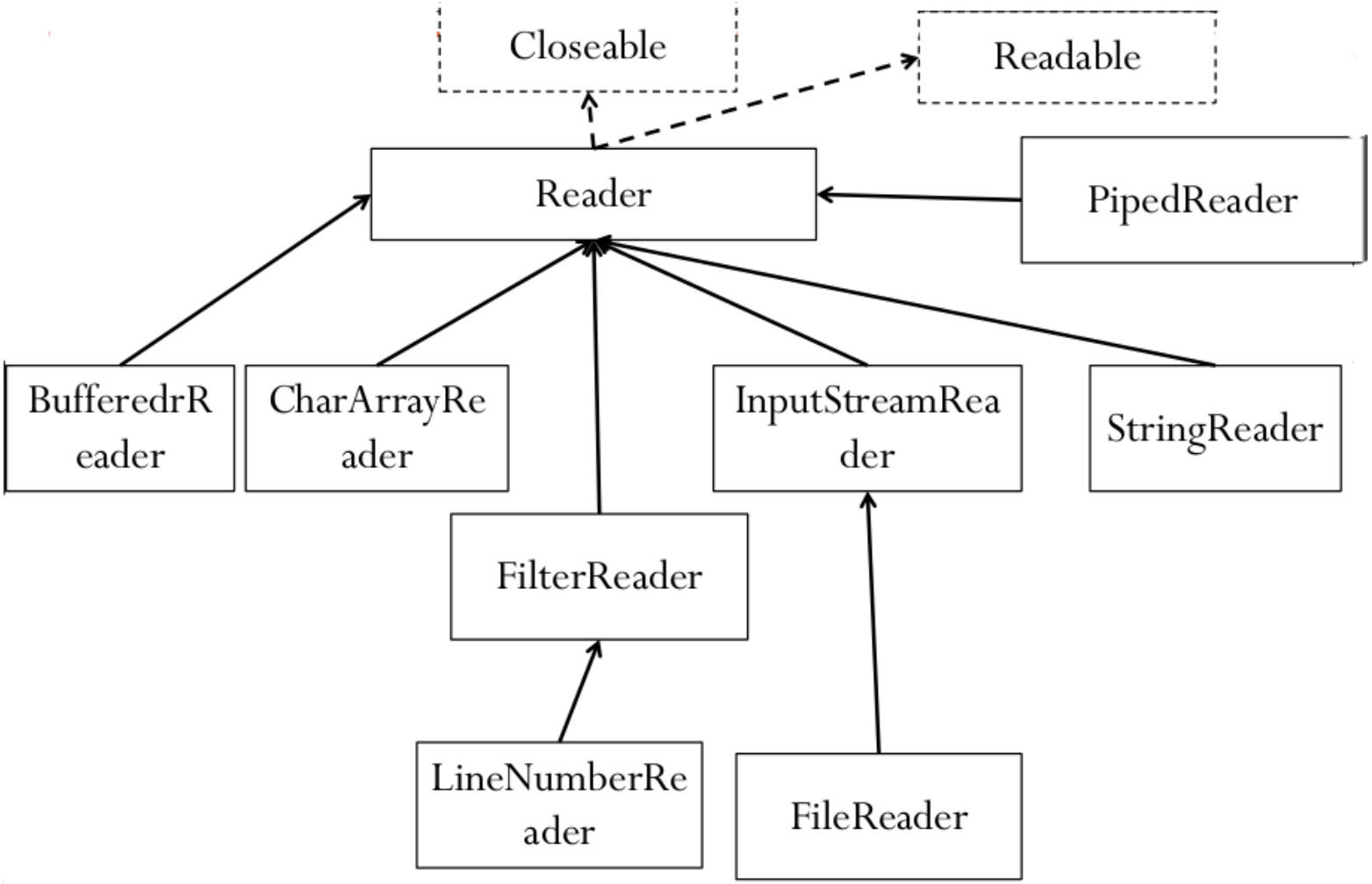
InputStream of IO



Writer of IO


Appendable
Closeable
Flushable
Writer
PipedWriter
BufferedWriter
CharArrayWriter
OutputStreamWriter
StringWriter
FilterWriter
PrintWriter
FileWriter

Reader of IO


Closeable
Readable
Reader
PipedReader
BufferedrReader
CharArrayReader
InputStreamReader
StringReader
FilterReader
LineNumberReader
FileReader