BITS, Pilani – KK Birla Goa Campus
Department of CS&IS

CS/IS F213 Object Oriented Programming
CS/IS C313 Object Oriented Programming and Design

Lab-10 *Dt.04.11.2014*

The pre-lab work for the lab is as follows.

Learn about the following Java classes

File, RandomAccessFile, FileChannel, ScatteringByteChannel, GatheringByteChannel, FileLock, FileChannel.map(), MappedByteBuffer, Pipe
FileReader, FileWriter, FilterReader, FilterWriter, PipedReader, PipedWriter **(for post-lab)**
(Some of these classes are explained in **Ch 10: The I/O Package** from *The Java Programming Language, Ken Arnold, James Gosling and David Holmes, 4th Edition / 3rd Edition*.)

The in-lab work for tenth lab is as follows.

Question-1
Write a java program named **Copy.java** to copy a file into two target files. The program is to be invoked as
java Copy src dst1 dst2

src file will be copied to dst1 and dst2.

Question-2
Modify **Sum.java** program to work on large files (>1GB)
(Hint: Work with segments of file by sequentially mapping 1MB at a time into heap using **MappedByteBuffer**)

Question-3
Write a java program to read 4096 bytes at a time from a file and scatter the bytes to two destination files. Of these byte segments, first 1024 bytes are to be written to dst1 and the rest of the bytes are to be written to dst2. Modify **Copy.java** program to perform this task. Write a program called **Merge.java** to perform the reverse operation.
(**Hint**: http://tutorials.jenkov.com/java-nio/scatter-gather.html)

The post-lab work for nineth lab is as follows.

Question-4
Modify **Copy.java** to get exclusive access on the target files before you perform the copy operation.
(Hint: Insert channel locking code)

Question-5

Implement the following code skeleton using pipes.

```
class PipeDemo {
     //create a pipe with corresponding source and sink channels

     public void copySrc(FileReader src) {
          //write code to read bytes from a file and put the data into
pipe sink channel
     }
     public void copyDst(FileWriter dst) {
          //write code to read from a pipe source channel and put the
data into a file
     }
}
```

Write appropriate main method to exercise your code.

References

Java NIO Tutorials

http://www.ibm.com/developerworks/java/tutorials/j-nio/j-nio.html (don't bother with networking part)
http://tutorials.jenkov.com/java-nio/index.html
http://www.javaworld.com/article/2078654/java-se/five-ways-to-maximize-java-nio-and-nio-2.html

File Locks

http://examples.javacodegeeks.com/core-java/nio/filelock/create-file-lock-on-file/
http://www.programcreek.com/java-api-examples/index.php?api=java.nio.channels.FileLock

Java Documentation

http://docs.oracle.com/javase/7/docs/api/java/nio/channels/package-summary.html
http://docs.oracle.com/javase/7/docs/api/java/nio/package-summary.html
http://docs.oracle.com/javase/8/docs/technotes/guides/io/example/