Dept. of Computer Science and Engineering
CS69201: Computing Lab

Assignment 6 **Maximum Marks: 100**
Deadline: 19th September 2022

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1. The application ***gs*** stands for ghostscript – an application which interprets a language called postscript. The language postscript is a standard language for representing documents (loosely called ps-files). The language supports very simple features for drawing different shapes.

   Before you start this assignment, run ***gs*** from your command prompt. You will find that the application opens a window for drawing. The original window (from which you issued the ***gs*** command) will show a prompt, **GS>**. Now issue the following command:

   ```
   100 100 moveto 200 200 lineto closepath stroke
   ```

   This will draw a line in the drawing window. In the language postscript, this is a collection of four statements, having the following meanings:

`100 100 moveto`	– move to the co-ordinate (100, 100)
`200 200 lineto`	– draw a line to the co-ordinate (200, 200)
`closepath`	– consider the path to be closed
`stroke`	– show the path in the drawing area

   Taken together, these four statements draw a line from (100, 100) to (200, 200). Please familiarize yourself with ***gs*** by drawing a few other lines. You can come out of ***gs*** by giving the command, ***quit***.

   We wish to develop a line-drawing application using ***gs***. The program should read pairs of points (namely the co-ordinates of two points) and draw a line between them in a separate window. After entering the endpoints of each line, the program should ask the user whether he/she wishes to draw any more lines.

   To implement this application, write a program A which forks a child process B. Create a pipe between process A and process B. Redirect the standard input (stdin) of B to the pipe. Then let B execute ***gs*** (using execlp()). Let A read the co-ordinates of the endpoints of lines and write the postscript statement for drawing the line (as illustrated above) into the pipe (note that you must write a '\n' character at the end of the statement while writing the statement into the pipe).

2. You may extend the shell created in the previous assignment set to make it possible to pipe one command through the other using the '|' operator. For example, it should be possible to give the following commands to your program:

```
ls –l | more
```

or

```
cat abc.txt | grep iitkgp
```

For simplicity, you may assume that at most one pipe is used in a command line. Your program must create the pipe between the processes executing the two commands.