Project #1 – 2D Drafting package

Making use of the codes you have written (and the knowledge you gave gained) from the first 3 homework assignments, you **and your partner** are to construct a 2-dimensional drafting software for this project. You will want to create a screen template upon which the user can generate a wide variety of useful graphics, in a mechanical drafting context.

Minimum Requirements for this project:
- The user should be able to generate basic 2D "shapes", such as points, lines, and arcs, and basic polygons, such as squares, triangles, rectangles, circles, ellipses, etc.
- You should create a functionality such that these graphics operations be generated through appropriate keyboard keystrokes (i.e. "L" for line, "C" for circle, etc.)
- As with previous assignments, the ability to select/deselect these shapes will also be required.
- Graphics manipulation should be a functionality within your drafting package. In other words, the user should have the ability to manipulate selected graphics that are located on the screen, by way of translation and rotation as a minimum. (Note: rotations must be performed about some point – the pre-defined coordinate origin of your screen, perhaps. Or, you could define the pivot point to be the center point of the selected object. The choice is yours – just be sure to document your actions in your report.)
- The user should have the ability to both save current graphics (in a data base), and, at a later date, retrieve and load those previously generated graphics from the data base. Thus, you will need to devise a mechanism for storing the various data types. If you recall, many of these basic concepts were covered in Lecture #5. (Note: A mechanism for defining file names need not be devised – you can assume a single static file name to make things easier for yourselves.)
- Finally, to verify the functionality of your software, the instructors would like to see you generate some kind of **relevant** static or dynamic 2D graphics image.

Additional (and desirable) functionalities to consider:
- Additional transformation options: scaling and mirroring.
- You may wish to generate a user-friendly template of simple screen buttons which, when pressed, will generate the aforementioned graphics objects.
- A coordinate-axis system, for reference purposes.
- A drawing grid whose density is controlled by the user.
- Colors (background, cursor color, grid color, etc.)
- On-line help files or documentation to show the user how to use your program and its features. These could be menu-driven, or simply generated by keyboard/mouse clicks.

Advanced functionalities to consider:
- A "snap to grid" option.
- A scroll down menu system which contains desired features/options.
- 4-view (Top, Side, Front, Iso) mechanical layout.
- A more convenient means for saving files with varying file names.
- The capability to generate B-spline versus Bezier curve types. (Note: The theory of graphical generation of curves/surfaces won't be presented in lecture until late October, near the Project due date. However, we certainly encourage interested graphics programmers to investigate these curve types in advance).

Grading criteria will be based upon the following:
- A functional computer program that exhibits the *minimum* requirements listed above. You will be expected to demo your program for the instructors during their office hours ***during the week immediately after*** the Project is due.
- Your ability to incorporate some of the "additional functionalities" into your program.
- Special consideration will be given to those students who are able to incorporate "advanced functionalities" into their program.
- Screen captures of your software and 2D images generated with your software.
- An 8-10 page organized, typewritten, and concise description of your program and its features. In your report, you should briefly describe how tasks were partitioned amongst group members.
- For sake of completeness, please supply a printout of your computer code. To save paper, please print your code text in small fonts, and if possible, on both sides of the page. Include this printout as an additional Appendix to your 8-10 page typewritten report.

You are to work in groups of 2 on this Project. No exceptions.
Due Date: October 26, 2001, BEFORE class.