Starting with a 640 by 480 pixel screen draw the above picture of the Big Dipper. You will need to figure out the best you can the coordinates of the 8 stars (hints are given below). Your final drawing should look like that given above.

**FYI:** Mizar and Alcor are optical binaries. Only Mizar at magnitude 2.1, the brighter of the two, is considered one of the seven stars making up the Big Dipper. Alcor, a 4th magnitude star is 1 ly. distant from Mizar.

Begin by plotting the eight stars as points (use `glBegin(GL_POINTS); ... glEnd();`); To make the vertices for the stars standout more, I increased the vertex size to 4 pixels by calling

```
glPointSize(4.0);
```

before drawing the vertices.
Next using the same set of vertices draw the connecting lines using
```
glBegin(GL_LINE_STRIP); ... glEnd();
```

Finally add the names by calling the `displayStr()` function whose code is given below where `x` and `y` are the pixel coordinates of lower left hand corner. Text to be printed is passed as a `cstring` (e.g. “Dubhe”);

```c
void displayStr(int x, int y, char s[])
// inserts label at coordinates (x, y)
// where (x, y) is lower left hand coordinate
{
    glRasterPos2i(x, y); \ 
    for (int i = 0; s[i] != '\0'; i++)
        glutBitmapCharacter(GLUT_BITMAP_8_BY_13, s[i]);
}
```

You will have to shift the `(x, y)` coordinates for each string so as not to over-write the star.

The textbook where I found this exercise gave the coordinates of the eight stars as follows

- **Dubhe**: (289, 190)
- **Merek**: (320, 128)
- **Phecda**: (239, 67)
- **Megrez**: (194, 101)
- **Alioth**: (129, 83)
- **Mizar**: (76, 72)
- **Alcor**: (73, 75)
- **Alkaid**: (20, 10);

Unfortunately since these coordinate placed the constellation in the lower left-hand corner of the screen, I had to compensate by adding a constant `x` and `y` value (`x = 125, y = 125`) to shift each point to the center of the screen.

To add some color to the final drawing I made the text red (`glColor3f(1.0, 0.0, 0.0)`) and the line gray (`glColor3f(0.5, 0.5, 0.5)`). The stars I made black (`glColor3f(0.0, 0.0, 0.0)`);

Of course the code to display the constellation will reside in your `display()` call back function..

Use Alt+PrtScr to copy your figure and paste it to a Word document. Hand in this document along with the source code. Be sure to document according to the Documentation Standards.

Hand in
- This assignment sheet
- copy of source code file
- copy of the figure