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Manual for Project 3

1. Setup

- To compile I used the following:

```
g++ main.cpp -o main.out -lGL -lglut -lGLU -lm
./main.out
```

- This program uses text files for input. Make sure that they are in the same working directory or provide the full path. Path can be changed at the top of the program. The string called "inputFile" is the input path.
- The polyhedron in the text file will be drawn when starting the program.
- It is important that there are new lines(and empty) after the last point in the input file. Otherwise it will not read correctly. Use the same format as the input file provided.

2. Running the program

The program uses the keyboard to select what actions to be performed on the polyhedra.

After starting the program you will get a list of action in the console. To select an action you need to click on the window with the polygons with your mouse and then press a number on your keyboard.
Then the program will ask you to fill in e.g. "Enter the new Phong constant.." And your choice must be typed into the console. Pressing enter will submit the choice.

So in short, choose an action by selection the window by simply clicking on it and pressing the desired number, then the rest is done in the console.

3. Change K_a/Ambient coefficient

Select the window and press "**1**" to change k_a. Then you enter the new values, which all ought to be between 0 and 1.

Example:

```
 Enter the new values for K_a example: 0.2 0.3 0.7
0.3 0.5 0.4
```

4. Change k_d/diffuse coefficient

To change k_d you need to select the window and press "**2**". Then you enter the new values, which all ought to be between 0 and 1.
Example:

```
 Enter the new values for K_d example: 0.8 0.6 0.8
0.3 0.6 0.8
```

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5. Change k_s/Specular coefficient

To change k_s you need to select the window and press "**3**". Then you enter the new values, which all ought to be between 0 and 1.
Example:

```
 Enter the new values for K_s example: 1.0 0.6 1.0
0.9 1.0 0.8
```

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6. Change focal point

To change the position of the focal point, you need to select the window and press "**4**".
Then you will be asked to enter the new coordinates
Example:

```
 Enter the new coordinates for the focal point example: 0.5 0.5 -2.0
0.5 0.5 -0.7
```

---

7. Change light source position

To change the position of the focal point, you need to select the window and press "**4**".
Then you will be asked to enter the new coordinates
Example:

```
 Enter the new coordinates for the light source point example: 0.5 0.5 2.0
0.5 0.5 3.0
```

---

8. Changing the Phong constant

To change the Phong constant, select window and press "**6**". Then enter an integer from n = 1,2,3…..
Example:

```
 Enter the new phong constant(n), example: 5.
3
```

---

9. Change ambient light intensity

To change the ambient light intensity, select window and press "**7**". Then enter a number between 0 and 1.

```
 Enter the new intensity for ambient light(I_a), example: 0.5.
0.8
```

---

10. Change light source intensity

To change the light source intensity, select window and press "**8**". Then enter a number between 0 and 1.

```
 Enter the new intensity for light source intensity(I_l), example: 0.8
0.9
```

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11. Set half-toning

To change the level of half-toning, select window and press “**9**”. Then you will be asked to enter a number between 1 and 9.

To turn off half-toning you need to set the level to 9!

```
  Enter the level of brightness in halftoning, example: 7
4
```

This takes a few seconds to load as it has to redraw everything.

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12. Exit

Select window and press “**0**” to exit the program.

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12. Implementation

Algorithm	**Line**
Phong	Phong header file. Line : 146-229
Gouraud	Gouraud header file, and Draw Line. (Gouraud)Line : 28-106 (Draw Line) Line : 39 - 111
Half-toning	Half Toning header file Line : 28 - 197 (repeated for each projected, sorry :c)
Painter’s	Main Line 160 - 183