Graphics Transformations - Ex3

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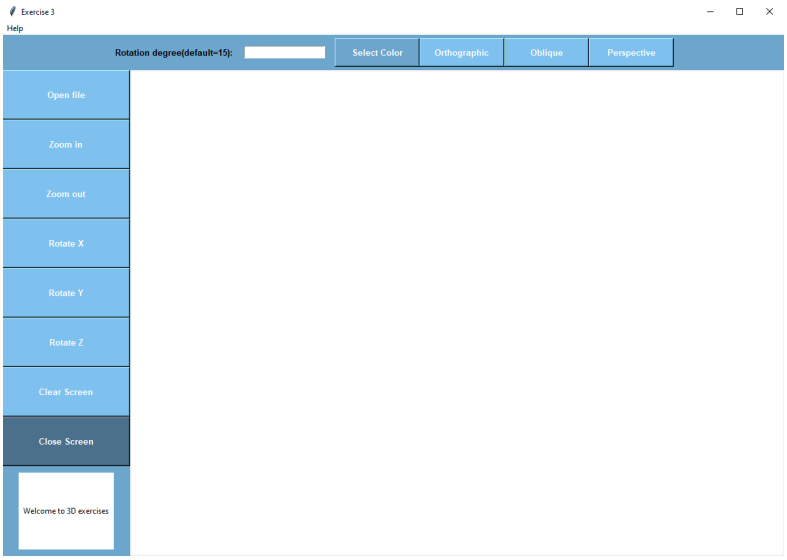
Instructions

To start the program, please run the main.py file.

1. The user will open the program and will choose the wanted file to get started to do projection on it.



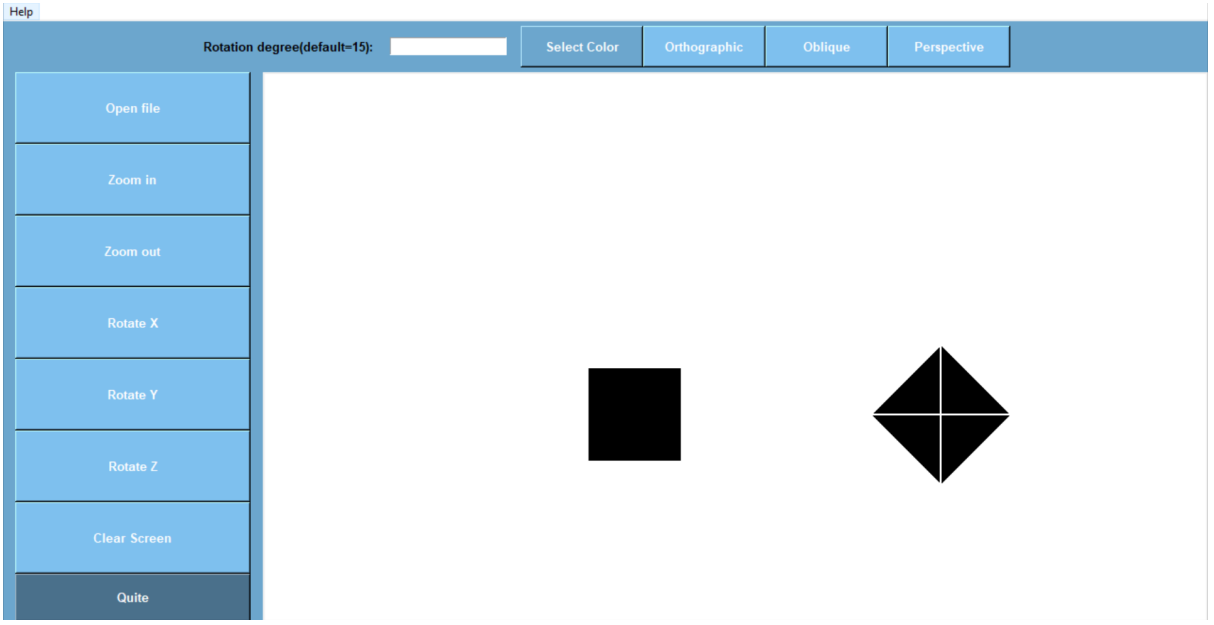
The file should be in the following format:

```
#coords
1 -200,-50,-50
2 -100,-50,-50
...
#polygons
1 1,2,4,3
2 2,6,8,4
...
```

You can select the file we provided,with the name: **"polygons.txt"** to make it easier to get started**.**

Please note! If your input file isn't in the wanted template, you will not be able to continue to use the system and you will ask to provide a new one.

2. After you select the coordinate file, you will see the paint tailored to your screen size. The default projection is Orthographic.

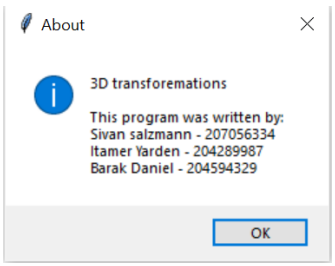


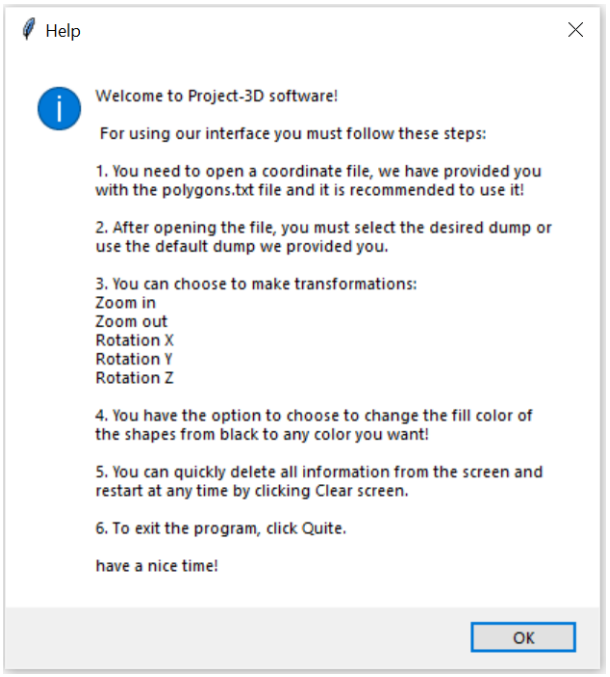
3. Now you can choose the wanted button from the following list:
    - Header button provide different projections and color manipulation
        - Select color - choose what color to **fill** the polygons
        - Orthographic.
        - Oblique.
        - Perspective.

    - After choosing a file you'll be able
        - Zoom in - Scaling transformation
        - Zoom out - Scaling transformation
        - Rotate X - Rotate transformation
        - Rotate Y - Rotate transformation
        - Rotate Z - Rotate transformation
        - Clear screen - Clear the screen to start again.
        - Quit - Exit the program.

Help windows

You can access the help windows by the top menu in the window:





Data in the program

- **Data class - (members):**
    1. Coords
    2. Poly points
    3. Polygons
- **Polygon class - (members):**
    1. Coords
    2. zIndex
    3. Color
    4. Normal
    5. Depth
    6. Visible

Functions flow

Projections:

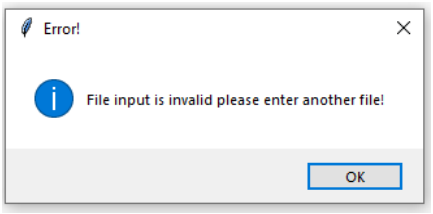
- **Otographic:** The user will press the otograpic button in the menu in the screen -> draw(“otographic”) -> getPolygons(“otographic”)->otographicCoords()-> canvas.createPolygon(poly,colors) -> presentMessage(“Projection type: otographic”)
- **Oblique:** The user will press the oblique button in the menu in the screen -> draw(“oblique”) -> getPolygons(“oblique”)->obliqueCoords()-> canvas.createPolygon(poly,colors) -> presentMessage(“Projection type: oblique ”)
- **Perspactive:** The user will press the perspective button in the menu in the screen -> draw(“perspective ”) -> getPolygons(“perspective”)->perspectiveCoords()-> canvas.createPolygon(poly,colors) -> presentMessage(“Projection type: perspective ”)

Transformations:

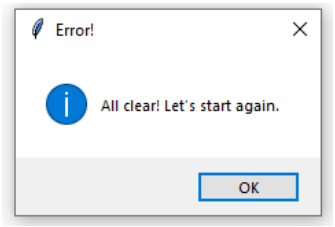
- **Scaling:** pressing either “zoom in” or “zoom out” button activate the scaling transformation which multiplies each polygons on the Data.polygons coordinate in the scaling matrix: scle(“in/out”) -> scale(“in/out”) -> draw(type_projection)
- **Rotate**: pressing either “rotate x”, “rotate y” or “rotate z”, button activate the rotate transformation which multiplies each polygons on the Data.polygons coordinate in the rotate matrix: rotation(“x/y/zt”) -> rotation(“x/y/z”) -> draw(type_projection)

Exceptions

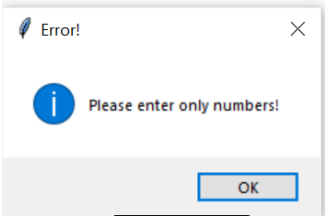
- Unsupported text file selection when selecting open file button.



- When the user chooses to clean the screen on the clear button.



- Please enter only numbers when you need to input degree in scale.



- When the user chooses transformation or projections before choosing file input, there will be exceptions.