Code Checkpoint README - Moebius Transformation in ASCII Art

601.429 Functional Programming in Software Engineering

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Professor Smith

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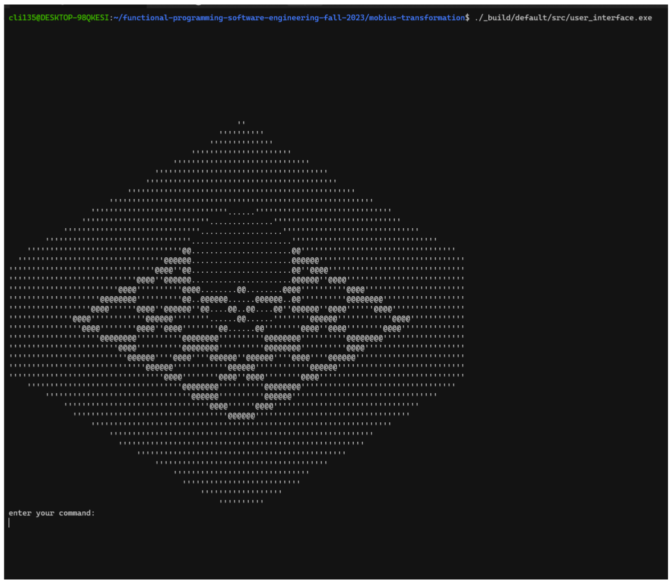
Code Checkpoint README - Moebius Transformation in ASCII Art

Example run of the application upon startup:

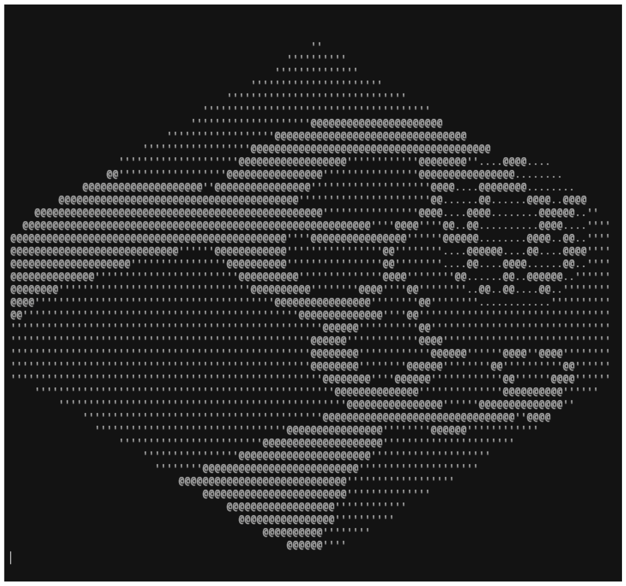
./_build/default/src/user_interface.exe

cool



```
cli135@DESKTOP-98QKESI:~/functional-programming-software-engineering-fall-2023/mobius-transformation$ ./_build/default/src/user_interface.exe
```

```
enter your command:
```



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1. How to run the program / Usage:

- dune b
- dune test
- **./_build/default/src/user_interface.exe**
  - This command runs the program.

- You will then see an image displayed, with the option to enter commands interactively. Here is a list of commands that are accepted syntax:

```
How to use the user interface:

  set [alpha/beta] [angle] : set alpha/beta to the input angle in degree
      set alpha 90
      set beta 180

  add [alpha/beta] [angle] : increment current alpha/beta by the input angle in degree
      add alpha 15
      add beta -10

  view [Sphere/Planar/Orthogonal] : change render views
      view Sphere

  set center [xfloat] [yfloat] [zfloat] : set the sphere center to a new location,
zfloat must be a positive value.
      move center 0. 1. 3.

  set [paramname] [paramvalue] : set all the customizable parameters for the viewport
      set img_w 100
      set view_size 4
      set plane_bd 4
      set half_edge_length 2
      set line_w 0.25
      set grid_size 2
      set frame_rate 30
      set duration 2.

  cool : this will play a cool animation :)

  reset: reset all parameters

  exit: exit the program
```

Notable updates to the program:

- Hongyi
  - refactored the user interface extensively,
  - added the capability for supersampling in the rasterizer, and
  - wrote animations for the parameters and refactored the way the keyframe animations are done (by jointly interpolating parameters).
    - If you type '**cool**' in the **./_build/default/src/user_interface.exe** application, then a predefined animation will run.
  - The updates to the code are in **rasterizer.ml** and **user_interface.ml**

- Christopher
    - refactored some of the user interface options
    - refactored ascii_printer.ml to be cleaner
    - wrote functions to read from and write to PNG files using the imagelib library

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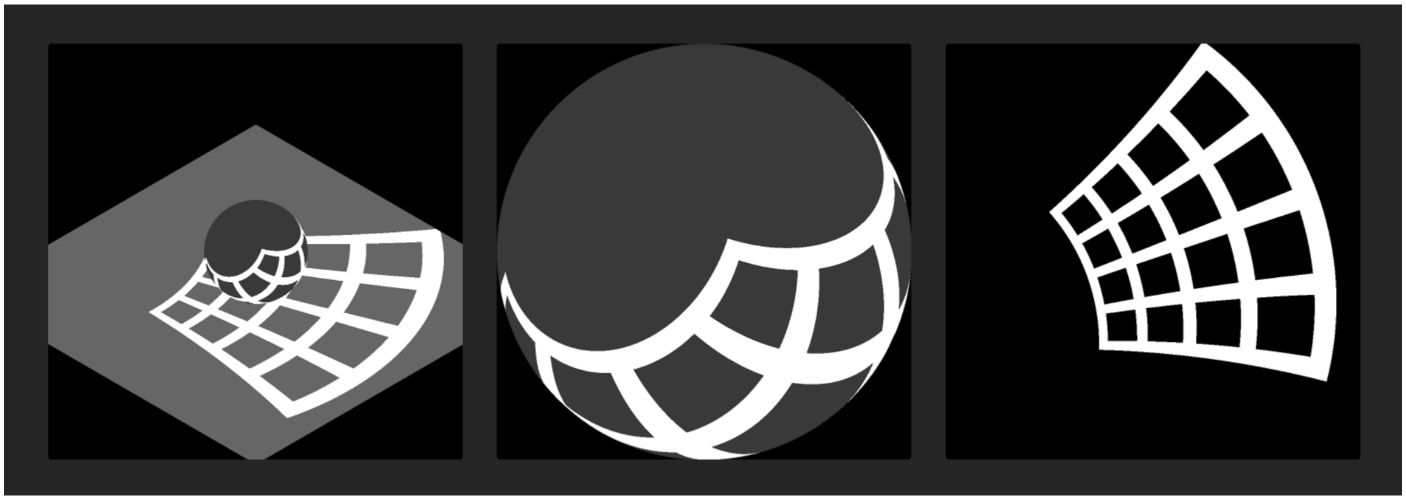
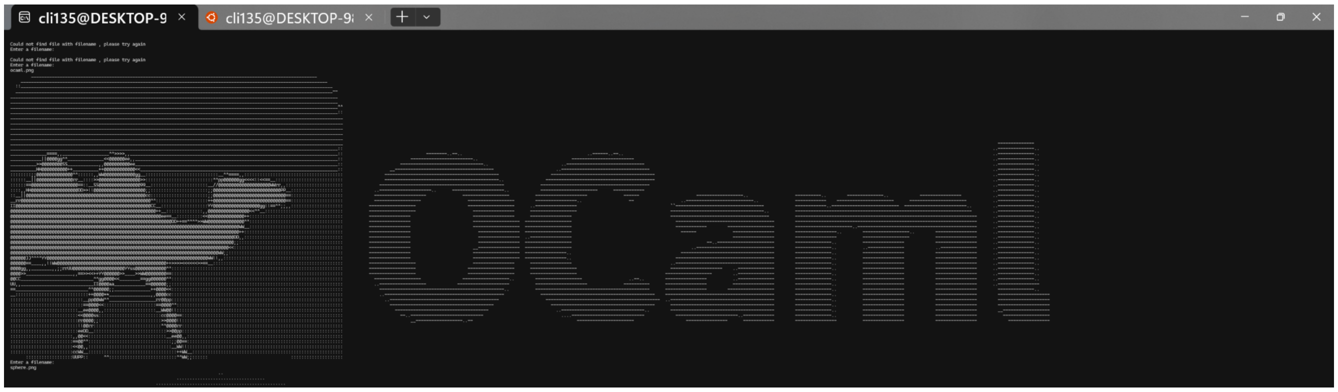
2. A list of libraries we are using
    a. Core
    b. OUnit2
    c. imagelib
        i. This library has been tested and is working now, with the functionality displayed below! Namely, we can
            1. read from PNG files, displaying them as ASCII art, and we can
            2. write to PNG files, displaying them the rasterizer output as normal PNG images (in print_ascii.ml)
        ii. The results of writing to PNG files are shown below:



        iii. And the results of reading from PNG files and rendering them as ASCII art is also shown below:



```
Could not find file with filename , please try again
Enter a filename:

Could not find file with filename , please try again
Enter a filename:
ocaml.png
```

```
Enter a filename:
sphere.png
```

3. Codebase in **mobius-transformation/src** as of 12-08-2023:
    - rasterizer.mli
    - rasterizer.ml
        - This performs the rasterization of the images for the Moebius transformation.
    - math.mli
    - math.ml
        - This is a math library that the rasterizer.ml uses.
    - ascii_printer.mli
    - ascii_printer.ml
        - This contains a function to print out a list of floats as an ASCII image.
    - user_interface.mli
    - user_interface.ml
        - This interactive executable handles the logic and syntax for the interactive user interface.
    - print_ascii.mli
    - print_ascii.ml
        - This interactive executable handles the reading from and writing to PNG files.
    - dune