Valley Terrain Modelling

Overview:-

We plan to model a valley with a river and a moving light source(Sun). This will allow us to implement fluid simulation, fractal terrain generation algorithms and shading. If time permits, we also plan to include wind dynamics in our project.

Features:-

1. **3d geometric transformation, 3d viewing, keyboard and mouse accessibility:** Camera controls, translational and rotational(3-axis), using key and mouse inputs etc.
2. Terrain Generated via 'Fractal Landscape' techniques.
3. Implementation of moving sun (light source), and water body effects.
4. **Texture+color:** Textures mapped to terrain(mountains,water bodies,etc) and clouds, with blue background color for sky
5. **Shading:** Lighting by Sun, inter terrain shadows (*optionally* trees and simple house structures)
6. **Text:** Text overlay detailing position of sun, detailing controls, etc.
7. **Animation:** Water ripple animation (*Optional component* - rustling trees).
8. **Moving objects:** *Optional component* - presence of 'boxlike' moving humans.

Deadlines:-

5th March

- Implementation of Basic Window and controls for cameras
- Basic polygon wireframes for terrain.

26th March

- Completing fractal landscape implementation.
- Designing the sky (Blue background, clouds, etc).
- Adding light source (Sun)
- Midway through shading implementation.
- Adding a simple waterbody surface.
- Begin mapping textures to the terrain.
- Adding text overlay

2nd April

- Implementing movement of Sun along the horizon.
- Improving waterbody rendering.
- Completing Shadow rendering.

9th April

- Completion of waterbody rendering.
- If ahead of schedule, implementing as many optional components as possible.
    - Trees and Simple House Structures
    - Moving Humans (Boxlike)
    - Winds - Rustling of trees

Tech Stack:-

- Primary Tools
    - GLUT/ GLFW+GLEW as OpenGL window framework
    - SOIL libraries for texture loading
- Helper tools – Python and other utilities which might be required for converting image or any other data to suitable format(if needed).

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