B2 - C Graphical Programming

B-MUL-200

my_world

The world is mine

{EPITECH.}
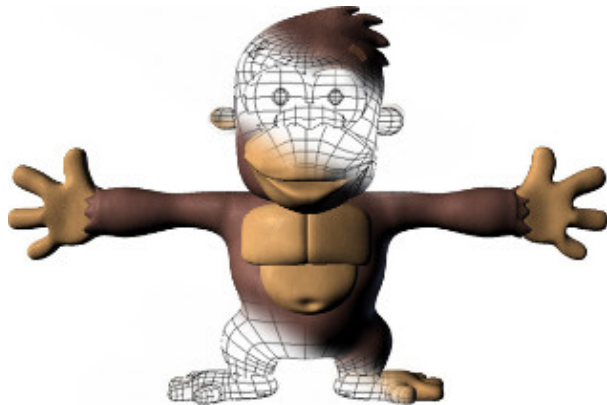
my_world

binary name: my_world
repository name: MUL_my_world_$ACADEMIC_YEAR
repository rights: ramassage-tek
language: C

- Your repository must contain the totality of your source files, but no useless files (binary, temp files, obj files,...).

- Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).

For this project you will create your own terraformer program.

Pick up some ideas from Tycoon Terrain for Unity3D.

Your challenge is to display a map and edit it at runtime.
The map is a wireframed map with tiles that are squares having all the same size.
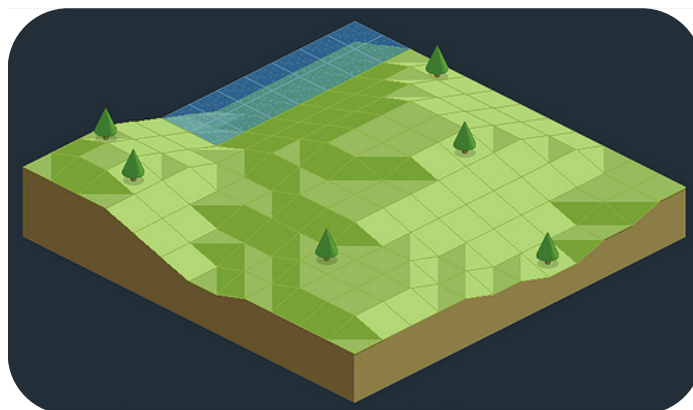The ground must be altered by raising, lowering or tilting tiles.

Tools will be provided to apply different effects and modifications upon the map.

Having a pleasant user interface and intuitive interactions is the key to a good editing tool. This project is the occasion for you to try your best on that topic.

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Requirements

Mandatory
The following features are **mandatory** (if your project is missing one of them, it will not be evaluated further):

- the window can be closed using events,
- the game manages the input from the mouse click and keyboard,
- animations in your program are frame rate independent.

Must
- The map **must** be displayed using a 3D projection (whether isometric or parallel),
- the tiles and their corners **must** be selected using the mouse,
- at least 3 effects (including the modification of altitude) **must** be implemented and selectable with a toolbar in the window (e.g. reinitialization of the tiles' altitudes, modification of the size of the area of effect, switching between "tiles selectable" and "corners selectable").

Should
- Your window **should** stick between 800x600 pixels and 1920x1080 pixels,
- the size of the map **should** be selected using editable textboxes in the window,
- help boxes **should** appear as the mouse hovers elements in the toolbar(s),
- the buttons **should** have at least 3 visual states : idle, hover, and clicked,
- tiles **should** have a texture,
- the format of saved maps **should** be in a .legend file,
- moving around on the map **should** be done with arrow keys and/or by positionning the mouse cursor on the edges of the window,
- zooming up and down should be done with keyboard and/or the scrolling button of the mouse.

Could
- The program **could** save the map in a file at the end of the program in the terminal,
- the program **could** save the map in a file at runtime using buttons and tools,
- the program **could** load a map at the beginning of the program in the terminal (argument or stdin),
- the program **could** load a map at runtime using buttons and tools,
- the name of the saved files **could** be chosen at runtime,
- tools can be selected using keyboard shortcuts,
- sounds **could** be played on user actions,
- textures of the tiles **could** change depending on the direction of their slope,
- elements (e.g. buildings, roads) **could** be added on the map in compliance with the landforms,
- water areas **could** be added.

> The size of your repository (including the assets) must be as small as possible.
> Think of the format and the encoding of your resource files (sounds, music, images,...).
> An average maximal size might be 15MB, all included.
> Any repository exceeding this limit might not be evaluated at all.

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AUTHORIZED FUNCTIONS

All the functions from the CSFML and the math library are allowed.

From the libc, here is the full list of authorized functions:

malloc	getline	(f)write
free	(f)open	opendir
memset	(f)read	readdir
(s)rand	(f)close	closedir

Any unspecified functions are de facto banned.

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