# B2 – C Graphical Programming

B-MUL-200

# My World

The world is mine

{EPITECH.}
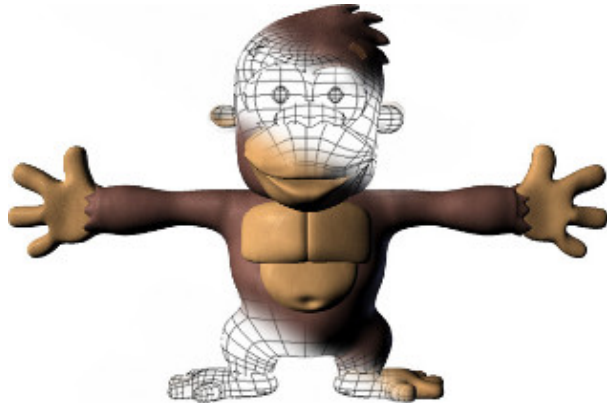
# My World

**binary name:** my_world
**group size:** 2
**repository name:** 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 have to create your own terraformer program. You can pick up some ideas from Tycoon Terrain for Unity3D.
Your main challenge will be to display a map and edit it at runtime.

- The map is a wireframed map whose tiles are parcels.
- Parcels are squares with all the same size.
- The terrain will be changed by raising or lowering entire tiles or only one of their corners.
- Tools will be provided to apply different effects and modifications upon the map.

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

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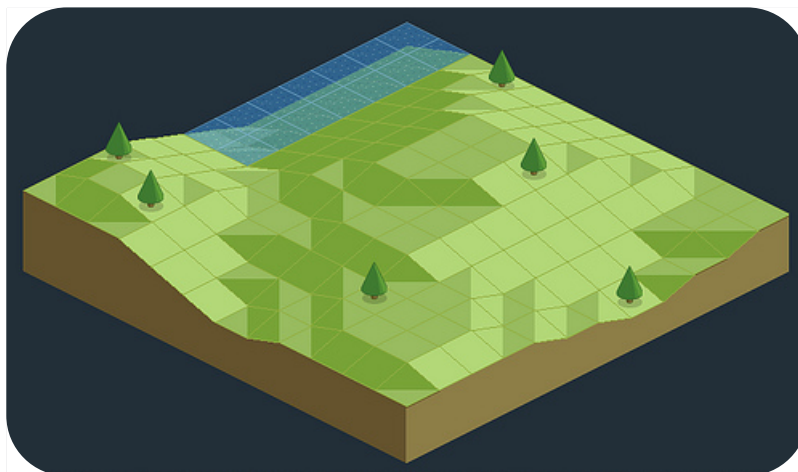
## Requirements

### 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 manage 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 (e.g. 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 tool-bar 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 Text 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 at 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 about the format and the encoding of your resource files (sounds, musics, images, etc.). An average maximal size might be 15MB, all included. Any repository exceeding this limit might not evaluated at all.

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*A screenshot of terrain tycoon package made with Unity3D*

# AUTHORIZED FUNCTIONS

Here is the full list of authorized functions.

**from the C library**:
* malloc
* free
* memset
* rand
* srand
* (f)open
* (f)read
* (f)close
* (f)write
* opendir
* readdir
* closedir
* getline

**from the CSFML library**
All functions

**from the math library**
All functions

> Any unspecified functions are de facto banned

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