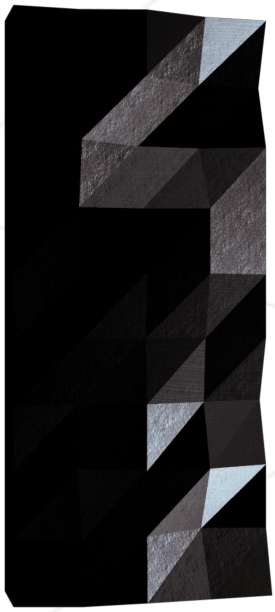


So Long

And thanks for all the fish!

Summary:
This project is a small 2D game.
Its purpose is to have you work with textures, sprites,
and other basic gameplay elements.

Version: 3.1

Contents

Chapter I

Foreword

Being a developer is advantageous when creating your own game.

However, a good game requires quality assets. In order to create 2D games, you will have to search for tiles, tilesets, sprites, and sprite sheets.

Fortunately, some talented artists are willing to share their works on platforms like: itch.io

In any case, ensure that you respect other people's work.

Chapter II

Objectives

It is time for you to create a basic computer graphics project!

`so long` will help you improve your skills in the following areas: window management, event handling, colors, textures, etc.

You are going to use the school's graphical library: the `MiniLibX`! This library was developed internally and includes basic necessary tools to open a window, create images and deal with keyboard and mouse events.

The other goals are similar to those of the first part of the common core: being rigorous, improving `C` programming skills, using basic algorithms, conducting research, etc.

Chapter III

Common Instructions

- Your project must be written in C.
- Your project must be written in accordance with the Norm. If you have bonus files/functions, they are included in the norm check and you will receive a `0` if there is a norm error inside.
- Your functions should not quit unexpectedly (segmentation fault, bus error, double free, etc) apart from undefined behaviors. If this happens, your project will be considered non functional and will receive a `0` during the evaluation.
- All heap allocated memory space must be properly freed when necessary. No leaks will be tolerated.
- If the subject requires it, you must submit a `Makefile` which will compile your source files to the required output with the flags `-Wall`, `-Wextra` and `-Werror`, use cc, and your Makefile must not relink.
- Your `Makefile` must at least contain the rules `$(NAME)`, `all`, `clean`, `fclean` and `re`.
- To turn in bonuses to your project, you must include a rule `bonus` to your Makefile, which will add all the various headers, libraries or functions that are forbidden on the main part of the project. Bonuses must be in a different file `_bonus.{c/h}` if the subject does not specify anything else. Mandatory and bonus part evaluation is done separately.
- If your project allows you to use your `libft`, you must copy its sources and its associated `Makefile` in a `libft` folder with its associated Makefile. Your project's `Makefile` must compile the library by using its `Makefile`, then compile the project.
- We encourage you to create test programs for your project even though this work **won't have to be submitted and won't be graded**. It will give you a chance to easily test your work and your peers' work. You will find those tests especially useful during your defence. Indeed, during defence, you are free to use your tests and/or the tests of the peer you are evaluating.
- Submit your work to your assigned git repository. Only the work in the git repository will be graded. If Deepthought is assigned to grade your work, it will be done

after your peer-evaluations. If an error happens in any section of your work during Deepthought's grading, the evaluation will stop.

Chapter IV

Mandatory part

Program name	`so_long`
Turn in files	`Makefile, *.h, *.c, maps, textures`
Makefile	`NAME, all, clean, fclean, re`
Arguments	`A map in format *.ber`
External functs.	• `open, close, read, write, malloc, free, perror, strerror, exit` • `All functions of the math library (-lm compiler option, man man 3 math)` • `All functions of the MiniLibX` • `ft_printf and any equivalent YOU coded`
Libft authorized	`Yes`
Description	`You must create a basic 2D game in which a dolphin escapes Earth after eating some fish. Instead of a dolphin, fish, and the Earth, you can use any character, any collectible and any place you want.`

Your project must comply with the following rules:

- You **must** use the `MiniLibX`. Either the version available on the school machines, or installing it using its sources.
- You have to turn in a `Makefile` which will compile your source files. It must not relink.
- Your program has to take as parameter a map description file ending with the `.ber` extension.

IV.1 Game

- The player's goal is to collect all collectibles on the map and then escape by choosing the shortest possible route.
- The `W`, `A`, `S`, and `D` keys must be used to move the main character.
- The player should be able to move in these **four directions**: up, down, left, and right.
- The player should not be able to move into walls.
- At every move, the current **number of movements** must be displayed in the shell.
- You have to use a **2D view** (top-down or profile).
- The game does not have to be in real time.
- Although the given examples show a dolphin theme, you can create the world you want.

`If you prefer, you can use ZQSD or the arrow keys on your keyboard to move your main character.`

IV.2 Graphic management

- Your program has to display the image in a window.
- Window management must remain smooth (switching to another window, minimizing, etc.).
- Pressing `ESC` must close the window and quit the program in a clean way.
- Clicking on the cross on the window's frame must close the window and quit the program in a clean way.
- The use of the `images` of the `MiniLibX` is mandatory.

IV.3 Map

- The map has to be constructed with 3 components: **walls**, **collectibles**, and **free space**.
- The map can be composed of only these 5 characters:
  0 for an empty space,
  1 for a wall,
  C for a collectible,
  E for a map exit,
  P for the player's starting position.

  Here is a simple valid map:

```
1111111111111
1001000000C1
1000011111001
1P0011E000001
1111111111111
```

- The map must contain **1 exit**, at least **1 collectible**, and **1 starting position** to be valid.

`If the map contains duplicate characters (exit/start), an error message should be displayed.`

- The map must be rectangular.
- The map must be enclosed/surrounded by walls. If it is not, the program must return an error.
- You must verify if there is a valid path in the map.
- You must be able to parse any kind of map, as long as it respects the above rules.
- Another example of a minimal `.ber` map:

```
11111111111111111111111111111111111
1E000000000000C00000C000000000001
10100101001000001010010000000010101
10100100101010100010010000000010101
1P0000000C00C0000000000000000000C1
11111111111111111111111111111111111
```

- If any misconfiguration is encountered in the file, the program must exit cleanly, and return "Error\n" followed by an explicit error message of your choice.

Chapter V

Bonus part

Typically, you would be encouraged to develop your own original additional features; however, more interesting graphic projects await you in the future. Don't spend too much time on this assignment!

You are allowed to use other functions to complete the bonus part, provided their use is **justified** during your evaluation. Be smart!

You will receive extra points if you:

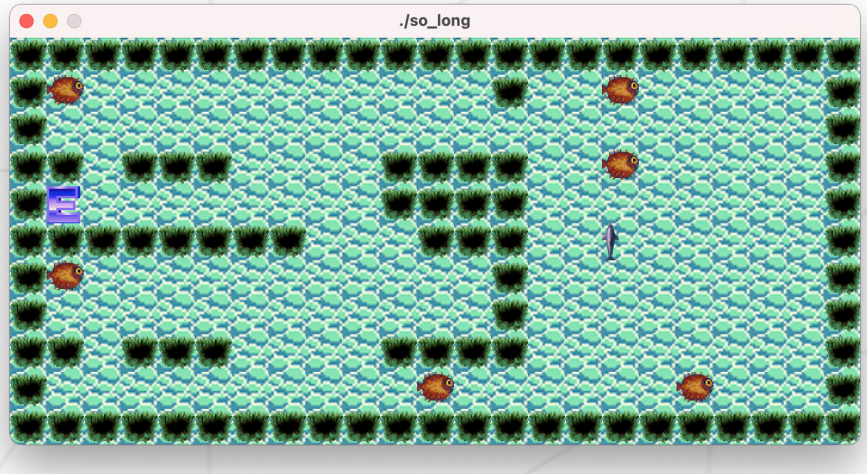
- Make the player lose when they touch an enemy patrol.
- Add some sprite animation.
- Display the movement count directly on screen instead of writing it in the shell.

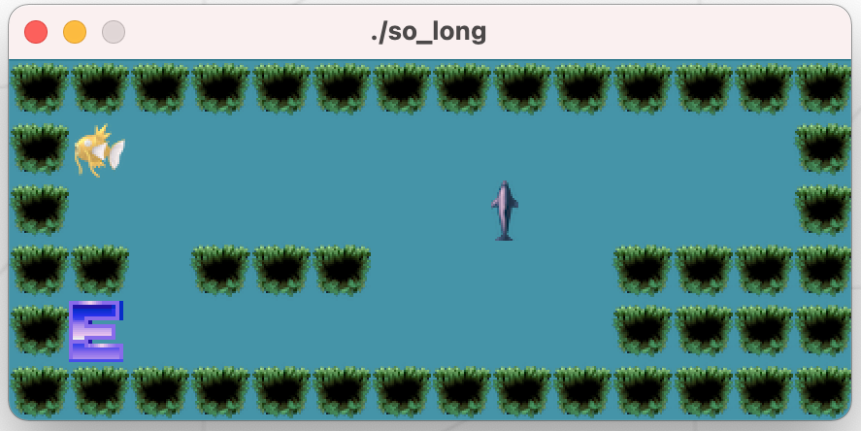
You can add files/folders based on bonuses as needed.

The bonus part will only be assessed if the mandatory part is PERFECT. Perfect means the mandatory part has been integrally done and works without malfunctioning. If you have not passed ALL the mandatory requirements, your bonus part will not be evaluated at all.

Chapter VI

Examples





`so_long` examples showing terrible taste in graphic design (almost worth some bonus points)!

Chapter VII

Submission and peer-evaluation

Submit your assignment in your `Git` repository as usual. Only the work inside your repository will be evaluated during the defense. Do not hesitate to double check the names of your files to ensure they are correct.

Since these assignments are not verified by a program, feel free to organize your files as you wish, provided you submit the mandatory files and comply with the requirements.

file.bfe:VAA0DAYFf07ym3ROeASsmsgnY0o0sDMJev7zFHhwQ
S8mvM8V5xQQpLc6cDCFXDWTiFzZ2H9skYkiJ/DpQtnM/uZ0