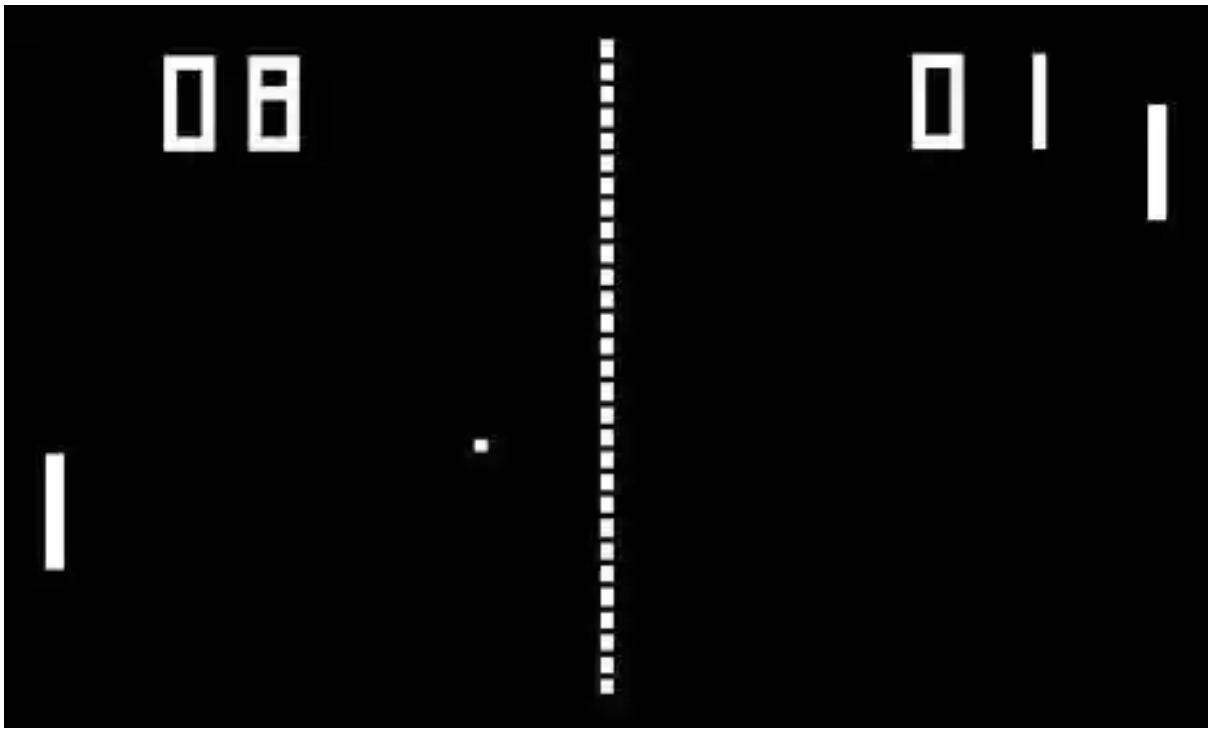
Pong Game



INTRODUCTION TO COMPUTER SCIENCE AND PROGRAMMING

Fall 2021

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Introduction

This paper should give an overview of the project “Pong Game” by Flurin Stiffler and Frederik Blümel during the course “Introduction to Computer Science and Programming”, lectured by Kai Waelti in Fall 2021. Here, we will share our initial ideas for the project and our approach to fulfill these ideas. It can be read as a journal, which will be steadily updated. The purpose of this approach is to transparently provide the reader the best chance to keep track of our progress and understand, why we made decisions in which way. In this very first project specification, we will briefly explain our project, the possible variations among the project, our key results and conclude with the personas, who might use the program in the end.

About the Project

Back in the 1970s, millions of people in the US, regardless of gender or age, were thrilled when their beloved arcades were added with a new game, that would be the foundation for the development of an entire industry, that would become one of the most popular games in the entire world and that would also from time to time make parents being concerned about their children spending too much of their time with this game. Yes, we’re talking Pong, the famous video game.

About Pong

In case you need a short refresher about what Pong is, we will let Wikipedia speak:

“Pong is a two-dimensional sports game that simulates table tennis. The player controls an in-game paddle by moving it vertically across the left or right side of the screen. They can compete against another player controlling a second paddle on the opposing side. Players use the paddles to hit a ball back and forth. The goal is for each player to reach eleven points before the opponent; points are earned when one fails to return the ball to the other.”

In our project, we will create our very own version of Pong and make further developments by including variations of the gameplay, which will be briefly explained in the following.

Disco-Pong

When you play Pong, you are immediately taken back to the “good old days”, when the mullet was the only acceptable hairstyle, clothes had to be really colorful to be considered cool and the make-up was even more colorful than the clothes. What would fit this colorful time better than a colorful Pong?
Therefore, we want to add a mode, where the game changes its colors every time, the ball hits on of the paddles. The gameplay remains the same.

Joker-Pong

As a second adaption, we want to add a mode, where each player receives a number of jokers. Each time a joker is played, the ball will freeze for some seconds. The players, however, can still move their paddles, so the player has some extra time to bring his/her paddle in the right position.

Random-Pong

How about bringing some Super Mario Kart element into the beloved game of Pong? Imagine an area in the field, which – when touched by the ball – will trigger a random action like getting extra points or changing the direction of the ball. We consider this as adding some salt to the soup, or thrill to the game. Therefore, we want to add some element of randomization to the game. Here, we will need to think more about how exactly this variation can look like, when we have a better understanding of the code.

Pong.exe

This is less a variation of the game, but we would like to enable the user to play Pong without opening a python environment. This would really increase the feeling of playing a game instead of playing with code. This would also be our last step when programming the game.

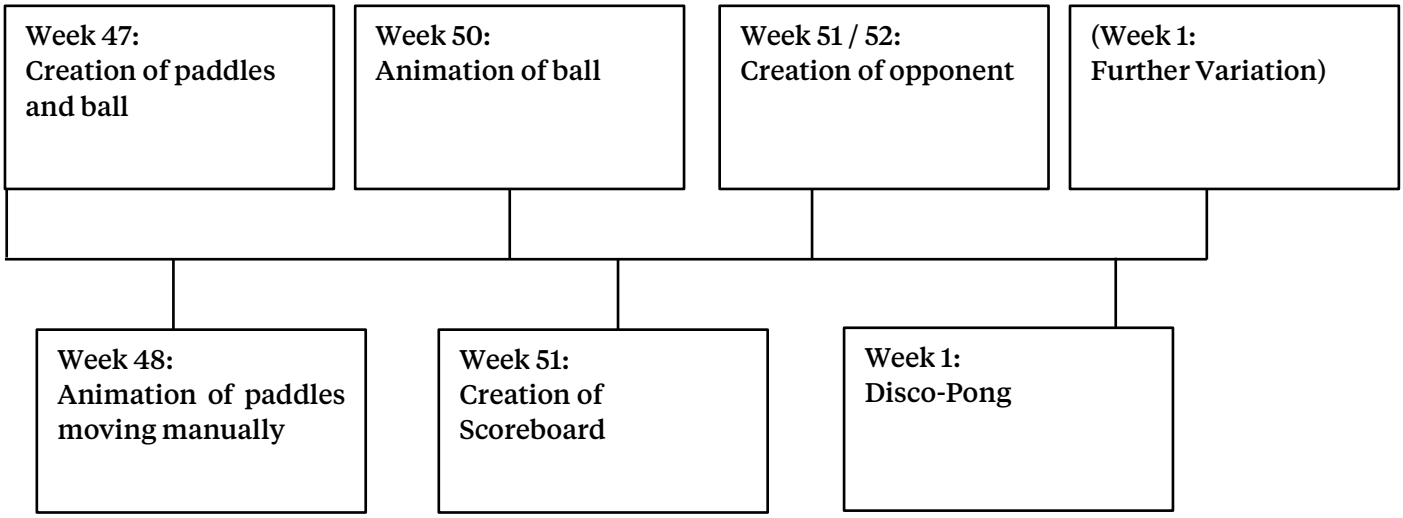
Key Results

In a first step, we will set up the original Pong game. This will be the major task and the groundwork for adding the variations later. Since the design and functionality of the Pong game is already set, we do not have to put lots of efforts into designing the gameplay. This is why we can quickly come to setting up the code. Here, we see two major tasks: Setting up the environment with the frame, paddles, the ball, scoreboard and all the belongings on the one hand and programming sort of an AI, which one player can play against on the other. Our agreement at this moment is to program an AI with multiple levels of difficulty and also the option to play against a human opponent.
The workload can roughly be broken down into the following steps:

- Creation of paddles and ball
- Animation of paddles moving manually
- Animation of ball
- Creation of Scoreboard
- Creation of opponent moving automatically and multiple levels of difficulty

We cannot claim to be experts in programming with python. So, for us, it is reasonable that the first goal is to make our program work. The question of efficiency thereby plays a subordinate role. As a consequence, the second step will be the review and potential optimization of the code with regard to efficiency. We plan with a workload of roughly five hours per person and week and aim to finish the basic set up before 31.12.2021. By then, the code should be efficient.
In the following steps, we want to develop and implement our very own variations as described before. We would like to provide all the variations; however, we will need to figure out how realistic this is against the backdrop of efforts. Furthermore, we do not want to overload the program. The goal should be to have an easy way to play Pong. We will thus begin with the implementation of Disco-Pong. The start of this will be on 01.01.2022 and will take us roughly five hours per person (as far as we can estimate by now). Based on how long it will take us, we will implement a second variation.

Roadmap



Code Examples

There is a solid basis of code that can be used to set up the basic pong game. Some examples can be found below:

Ball and paddle animation:
https://www.python-lernen.de/pygame-animation.htm

Pong Tutorial on YouTube:
https://www.youtube.com/watch?v=C6jJg9Zan7w&ab_channel=freeCodeCamp.org

Pong code using the turtle-library
https://www.geeksforgeeks.org/create-pong-game-using-python-turtle/

Project on Github:
https://github.com/VissaMoutafis/Pong

Personas

Michael		43 Years
Zurich	Father of two kids	Bouldering, Mountain biking, playing console
Marketing lead at xy gmbH	Early adopter	

Michael is 43 years old, but young at heart. He is an early adopter in new technologies and appreciates the emotional value of retro technologies like record players and old consoles. When having a time with his kids or his friends, he enjoys playing Pong, Pacman or older games of Zelda.

Nele		15 Years
Sion, Valais	/	Tennis, Hanging with friends, staying online
Student	Price sensitive	

Nele is a typical girl of the gen Z. She is raised with new technologies and social media and has a strong interest in these. When staying online, she plays mini games on websites from time to time. She therefore also has a temporary interest in Pong.

Jakob		26 Years
Basel	/	Hiking, Basketball, Geography
Student	Focus on retro products	

Jakob has a fable for retro products, because he appreciates the value of good old quality products. He owns an old espresso maker and a record player, rides a 1980's Bianchi bike and loves his Atari and Gameboy. When his friends are there, he plays Pong with them as a drinking game.