

The Phi Treadmill Training Plan App (TPTTPA)



A full-stack wellness project to show you the integrated use of some modern technologies.

Created by Paulo Jerônimo

Thank You, my God, for my health and the health of this project's users. I ask You, Lord, keep it as long as it's your will. So we'll be able to share the wisdom You gave us and have the necessary energy for our missions on Earth.

Amen.

Paulo Jerônimo, March 6, 2023.

1. What about this ...

1.1. ... project?

This project concerns building a full-stack app for the wellness area, but not only this! It was developed by me, [Paulo Jerônimo](#), with literally much sweat  left on the floor, at the sides of a treadmill, in this process.

Parts of this project are: 1) [the open source code](#) of the app created through it; 2) that app running in production; 3) [this ebook](#); and 4) a tutorial (Learn how to rebuild this app from scratch).

1.2. ... ebook?

This ebook is the TECHNICAL DOCUMENTATION for TPTTPA. It is aimed at programmers who want to learn or improve in full-stack development with a modern stack. A [Bash](#) script generates it in PDF format by invoking [Asciidoctor](#) after I edited [AsciiDoc](#) documents using [LunarVim](#), my current "text editor". So, it is entirely programmatically generated, and [you can get your personalized copy](#) (see next page)!

Owner of this copy: a "Wellness Hacker".

Version (date / commit): 2023-03-08 05:57:29 -0300 / 1d01d66.

Online version: <https://paulojeronimo.com/tpttpa/tpttpa.pdf>

1.3. ... cover image?

The cover image of this ebook is a [Midjourney](#)'s drawn image. My prompt to generate it was: "A realistic image of a man running on a 5% inclined treadmill. He is between 40 and 50 years old, is a little fat, and has a beard and short black hair. On his side, there is a TV showing a Fibonacci spiral. --aspect 4:5 --seed 5589144".

2. How to get your FREE copy of this ebook?

It's simple! Fill out the form in the link <https://bit.ly/3KUzwy6> (the QR code below) and follow its instructions.



Why?

1. To receive notifications of its updates.
2. To gain a non-rasterized PDF version and navigate its internal and external links.
3. To know how to build, test and execute the app's source code.
4. To get tips about how to use the app better.
5. To participate in the app's community.

Bonus (for buyers of plans of sale (under development) for this project):

1. **One Non-Fungible Token (NFT)** representing your copy.
2. Your name inside this ebook (a personalized version).

Table of Contents

1. What about this	iii
1.1. . . project?	iii
1.2. . . ebook?	iii
1.3. . . cover image?	iii
2. How to get your FREE copy of this ebook?	iv
3. Introduction	1
3.1. The author	2
3.1.1. Ideas for apps in the wellness area	3
3.2. How this project can be useful to you?	4
3.3. Videos	5
3.4. The way this ebook is write	6
3.5. Join the project's Telegram	7
3.6. Contribute	8
3.7. Wellness Hacking	9
4. About this project	10
4.1. Introduction	10
4.1.1. How can this project help you?	10
4.1.2. This project can NOT be helpful to you if	11
4.1.3. Why I am developing this project?	12
4.1.4. The TPTTPA codename	14
4.2. Goals and phases	15
4.2.1. Phase 1	16
Goals	17
Stack of Software	19
4.2.2. Phase 2	20

4.2.3. Phase 3	21
4.3. The Phi number	22
4.4. Rules	23
5. Technical details	24
5.1. Building a Development Environment	24
5.2. This version	25
5.2.1. Downloading the application	25
5.2.2. The application layout	26
5.2.3. Activating the environment	27
5.2.4. Testing	28
5.2.5. Measuring the test code coverage	30
Using coverage	30
Using pytest-cov	31
5.2.6. Running the app	32
Using Docker	32
5.2.7. Deactivating the environment	35
5.2.8. Cleaning the project directory	36
5.3. Tutorial: Learn how to rebuild this app from scratch	37

3. Introduction

Hi! Health and wisdom to you, "Wellness Hacker"!! 😊

I'll give you this nickname until you ...

... acquire your personalized version of this ebook!

After that, you'll receive a new copy of this ebook with much more content (plus [some other values](#)) and your name in the places where "Wellness Hacker" appear.

Get your copy of this ebook to receive the links inside it
(details after the cover)

3.1. The author

My name is [Paulo Jerônimo](#), "Wellness Hacker". I am the author of this project and your mentor in "[Wellness Hacking](#)" in the following pages. Thank you for downloading it and for reading it right now.

I like to develop software and practice Triathlon which I even carry as a tattoo on my left forearm. This is my lifestyle. So, I decided to create some projects to build apps for the wellness area.



3.1.1. Ideas for apps in the wellness area

"Wellness Hacker", I believe that some of my ideas for apps in the **wellness area** (\neg link to a page currently in Portuguese) can be much valueable. I'll show how in this project that we will implement together. It can be useful to you in one (or more) of the ways below.

Get your copy to free
of this ebook to free
the links inside it
(details after the cover)

3.2. How this project can be useful to you?

"Wellness Hacker", with this project you can:

- **First of all**, use this app, and provide feedback as a user.
- If you are a software developer, or intend to be one:
 - **Secondly**, you can develop it in phases starting from scratch, together with me.
 - **Finally**, you can help me to evolve it, if you want.

Get your copy of this ebook to the links inside it
(details after the cover)

3.3. Videos

"Wellness Hacker", you might also enjoy seeing my videos that are available about this content in [this playlist on YouTube](#). (TODO)

Get your copy
of this ebook to free
the links inside it
(details after the cover)

3.4. The way this ebook is write

"Wellness Hacker", this ebook is written in the [first-person point of view](#). I ([The author](#)) am writing directly to you (my dear reader). I am not using a third person to tell you a story (an imaginative intermediary - we don't need this person).

I already told you a little about [how I'm developing this ebook in technical terms](#). Did you notice that? I intend to give you more technical details about this when you buy an advanced plan for this project because writing this ebook gives me more skills in selling my work. Such information is not directly related to the contents of this ebook in particular, but I think it can help you to be "a better seller". Does it make sense to you?

Understand whether or not this ebook is for you by reading these sections:

1. [How can this project help you?](#)
2. [This project can NOT be helpful to you if ...](#)

3.5. Join the project's Telegram

Feel free to question me about this material through [this Telegram group](#).

Please, find out [why I am developing this project](#) and note the [Rules](#) I further describe in this document regarding what you can do with it.

Get your copy of this ebook to free
the links inside it
(details after the cover)

3.6. Contribute

Currently, I am working entirely alone on the development of this project. If you are interested in helping me with it, first read [this section](#). After that, I was hoping you could send me an email explaining your motivations to contribute so we can schedule a conversation about it. Please, observe that our communication needs to be only in English because this is the unique language I choose for this project.

Get your copy of this ebook to take the links inside it
(details after the cover)

3.7. Wellness Hacking

In the context of this project, "**Wellness Hacking**" has to do with a person's desire to develop systematic strategies, in the form of apps, to improve their health and well-being.

In this sense, a "**Wellness Hacker**" is someone willing to create or participate in developing software apps (in many different ways) for [Wellness Hacking](#).

Get your copy to free
of this ebook to free
the links inside it
(details after the cover)

4. About this project

4.1. Introduction

4.1.1. How can this project help you?

This project aims to help you in three (3) points:

- First of all, if you like, or need to, do workouts walking or running on a treadmill with a consistent training plan, this project is for your use!
- Secondly, If you are a software developer who wants to learn how to develop a good project from scratch using a modern and friendly stack, this is undoubtedly the right project!
- Finally, if you know about these software pieces individually but want to know how to glue them in a complete full-stack software development process, this is also the right project for you!

4.1.2. This project can NOT be helpful to you if ...

1. You are not interested in developing software in English, as your primary language to code and for communication.

This statement is intentionally directed at developers whose native language is not English.

2. You don't have an interest in [this software stack](#) I am using.

Even if you are not interested in one or more of the software I use in this stack, the development process of this app project can help you a lot even when working with other stacks.

4.1.3. Why I am developing this project?

Currently, I am developing this project with at least this five (5) intentions:

1. I want to help people in the ways [I said above](#).
2. Right now, I need to write and produce more content in English, to improve my written and speaking skills.

The videos I will record following the contents written here will also be in English. But it will have subtitles in Portuguese (my native language) too.

3. I need help from people. Today, I don't have a job. A few months ago, I decided to quit my last job. I did this because I wanted to have more time to grow my own small business related to Web3 software development for the wellness area. But today, I know that I made a wrong decision. I burned a big part of my money reserves without making money with my company. This wasn't related to my technical abilities, but with the pos pandemic moment we are living in, and my sales skills. So, this way, I need to return to the corporate market and find a good job.

I want a job where I can apply and share my development skills and help people, not only with technical matters. For example, I'm creating apps, like in this project, to help people with their health. Why? Because I have known the importance of good health for many years since my children were very young, as [I wrote in this Brazilian Portuguese document](#).

4. I've reached a point where I wouldn't say I like wasting my time participating in challenges to be hired for a technical position in software development. So, to demonstrate my knowledge of a software stack, I prefer to present projects like this.

5. I want to build a salable project. In the current phase, this project is in, **Phase 1**, I have no intention of selling it in any other way than the educational one, explaining the technologies I'm using in this stack. However, from **Phase 2** I intend to discover the best ways to sell this project to its end user.

So, in this project, we can help ourselves. **I will help you**, but I expect some help from you too. You can help me to find a job, and I will appreciate that. At the same time, I am selling some versions of the material you are reading to get some money to pay my bills. Here are **the details**.

4.1.4. The TPTTPA codename

TPTTPA is a codename for an application under development. Sure I will change the name of this project in the near future.

Get your copy
of this ebook to free
the links inside it
(details after the cover)

4.2. Goals and phases

TPTTPA is a project that helps you to use a treadmill cleverly to achieve your fitness goals.

You will get workouts that fit your own goals using this application. Also, the new ones will be adequate based on your evolution and feedback about your past activities.

This is also a project with educational purposes and **very well-defined goals** to be explained in detail in a tutorial demonstrating the use of the technologies adopted in its development.

This project is divided into some phases. Currently, I defined three (3) phases.

4.2.1. Phase 1

In this phase, I will create a simple web app that implements [this Google Sheet](#) in a more friendly and interactive way by creating a simple app that represents it.

I [need this app for my personal use](#). This way, I will also be its first beta tester user. [As a triathlete](#), I finished three Ironman races and have many years of experience walking and running on treadmills. I know which features I would like in an app to use when doing my treadmill workouts. Also, I wanted to help other people with this subject in the past. So, in [this video](#) I show you my first tentative about this. It was recorded in Brazilian Portuguese (without an English subtitle).

Goals

The primary goals of this phase includes:

- 1. Define the features of an application in a good way:**
 - a. Using the [Gherkin](#) syntax.
 - b. Creating good prompts that can be submitted to AI tools, like [ChatGPT](#), to help you implement the code.
- 2. Apply Behavior Driven Development ([BDD](#)) to implement the defined features.**
 - a. Also, applying Test Driven Development ([TDD](#)) for non-user-defined features.
- 3. Program in [Python](#) and [TypeScript](#) to create a simple app as a website.**
 - a. Python will be used in the back end.
 - b. TypeScript will be used in the front end.
- 4. Develop cleaning and testable code.**
 - a. Including asking help to [ChatGPT](#) in some occasions;
 - b. Creating good tests and measuring its coverage to guarantee the code's quality;
- 5. Demonstrate how to improve and refactor source code to be simpler and better.**
 - a. Transform ugly code into good coding with confidence and without leaving things break;
- 6. Explain how to write good documentation:**
 - a. Related to:
 - i. The project (like this);
 - ii. The code development process;

- iii. The code of the application;
 - b. In different formats (HTML, PDF);
 - c. Thinking in different versions and audiences;
7. **Use the AWS infrastructure** to:
- a. Build and create the development environment and the code pipeline.
 - b. Deploy the application components using technologies like **AWS Lambda, AWS DynamoDB**, etc.
8. **Sell the final content produced** in this phase as an introductory course about full-stack development.
- a. A full-stack project means software covering aspects from development to production and involving many technologies in the back and front ends.

Stack of Software

The following tables summarize all we will use to develop the app in this phase.

All process, techniques and softwares

AWS CDK, AWS CLI, AWS DynamoDB, AWS EC2, AWS Lambda, AWS, Asciidoctor, BDD, Bash, Browser, Docker Compose, Docker, Gherkin, GitHub Actions, GitHub Codespace, Git, Google Sheets, Linux Containers, LunarVim, Pytest, Python, SvelteKit, Svelte, TDD, Tmux, TypeScript, Ubuntu, Vagrant.

Layer	Programming Languages	Execution Environment	Tools, Libs, Frameworks, etc
Documentation	AsciiDoc, Bash	Ubuntu	Asciidoctor
Back end	Gherkin, Python	AWS	AWS Lambda, AWS DynamoDB
Front end	TypeScript	Browser	Svelte, SvelteKit

4.2.2. Phase 2

In this phase, the front end of this app will be refactored and improved to better fit a mobile app and also will have the first public available version in mobile marketplaces like Apple Store and Google Play Store.

Get your copy
of this ebook to free
the links inside it
(details after the cover)

4.2.3. Phase 3

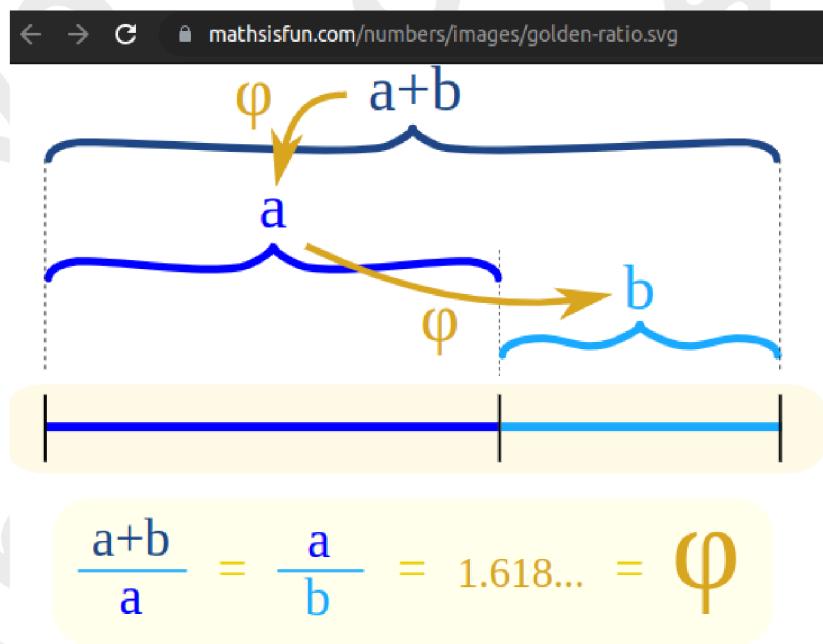
In this phase, the mobile app will be integrated with AI and Blockchain technologies.

Get your copy
of this ebook to free
the links inside it
(details after the cover)

4.3. The Phi number

The Phi number indicated in the project's name is used in many of its calculations. For example, in the basic plan, you can choose from workouts having 8, 13, 21, or 34 minutes. These numbers are all present in the Fibonacci sequence. In this sequence, each number is a sum of the two antecessors. This way, you can calculate the following number of this sequence: 55.

Fibonacci appears in many ways and areas, from biological to trading subjects. The division of two subsequent numbers of this sequence gives you the Phi number. For example, the division of 55 per 34 gives you the approximated value of 1.618. In mathematical terms, the correct value of Phi is calculated by the formula $(1+\sqrt{5})/2$ (you can input it in a sheet to see its final value).



Some nice references about this topic:

1. <https://www.goldennumber.net/>
2. <https://www.mathsisfun.com/numbers/golden-ratio.html>
3. <https://mathworld.wolfram.com/GoldenRatio.html>

4.4. Rules



This section is under development.

Get your copy
of this ebook to free
the links inside it
(details after the cover)

5. Technical details

5.1. Building a Development Environment



Section under construction.

Get your copy of this ebook to free
the links inside it
(details after the cover)

5.2. This version

5.2.1. Downloading the application

This section explains how you can build this version from a software developer's perspective, using command line tools. So, make sure you have [build your development environment](#) before continue the following steps.

Download the [project](#) from GitHub using git and change to its directory:

```
$ repo=https://github.com/paulojeronimo/tpttpa  
$ git clone $repo && cd "$(basename $repo)"
```

The source code for this project, made available as open source in the Git repository above, only includes its latest version. You will be able to observe this when accessing the repository. Understand why by [reading this text](#).



For this reason, if you have already cloned a previous version of this project and tried to do a `git pull`, you should get an error in this operation. Therefore, whenever you want to download a new version released as [described here](#), you will not be able to use this last command and will have to do a `git clone` again.

5.2.2. The application layout

```
.  
|-- .coveragerc  
|-- .dockerignore  
|-- .gitignore  
|-- .pytest.ini  
|-- Dockerfile  
|-- LICENSE  
|-- README.adoc  
|-- requirements.txt  
|-- scripts  
|   |-- clean.sh <- It cleans the project directory  
|   |-- common.sh <- It is included by other scripts  
|   |-- config.sample.sh <- It defines variables used by other scripts  
|   |-- docker.sh <- It simplifies the Docker use  
|   |-- install.sh <- It installs software used by this project  
|   |-- private.sh <- It is used by premium users  
|   |-- set-env.sh <- It configures variables and functions  
`-- tree.sh <- It shows the main directory tree of this project  
-- tests  
  `-- utils_test.py  
-- the_phi_treadmill  
  |-- __init__.py  
  |-- treadmill.py  
  `-- utils.py
```

3 directories, 20 files

5.2.3. Activating the environment

```
$ virtualenv .venv  
$ . .venv/bin/activate  
$ pip install -r requirements.txt
```

Get your copy
of this ebook to free
the links inside it
(details after the cover)

5.2.4. Testing

```
$ pytest
```

Beeing more verbose:

```
$ pytest -v -s
```

→ If .pytest.ini wasn't configured ...

- i. you should see an error when running the commands above. So, in order to fix that error, beyond creating the file .pytest.ini (or pytest.ini), you can also test by running one of the following alternatives:

Alternative 1:

First, let's remove .pytest.ini and see the error:

```
$ rm .pytest.ini
$ pytest
=====
ERROR collecting
tests/utils_test.py
...
...
E   ModuleNotFoundError: No module named 'the_phi_treadmill'
```

Next:

```
$ python -m pytest # <- use `python` to run the module `pytest`
```

Alternative 2:

```
$ export PYTHONPATH=$PYTHONPATH:. # <- configure and export the
variable PYTHONPATH
$ pytest
```

To undo (this alternative):

```
$ unset PYTHONPATH
```

Alternative 3:

```
$ > tests/__init__.py # <- create a file `__init__.py` inside the  
`tests` directory:  
$ pytest
```

To undo (this alternative):

```
$ rm tests/__init__.py
```

5.2.5. Measuring the test code coverage

Using coverage

```
$ coverage run -m pytest tests  
$ coverage report -m  
$ coverage html
```

Open the HTML files generated:

```
$ open htmlcov/index.html &> /dev/null &
```

- ¬ open *is a function that ...*
 - i. I wrote and have available in my terminal. On a macOS environment it already exists.

```
$ type open  
open is a function  
open ()  
{  
    xdg-open "$@"  
}
```

- ¬ If you are using Codespace ... ¬

The open function will not be available. But you can type the following commands:

```
$ npm install -g serve  
$ serve htmlcov
```

Port 3000 will be forwarded by Codespace and it will give you the link to navigate to the equivalent localhost page (<https://localhost:3000>).

Using pytest-cov

```
$ pytest --cov=tests --cov-report=term
```

```
$ pytest --cov=tests --cov-report=html
```

Get your copy
of this ebook to free
the links inside it
(details after the cover)

5.2.6. Running the app

Currently, the app only has a simple `main` block inside the `treadmill.py` module. To run it, type:

```
$ python the_phi_treadmill/treadmill.py  
[3.3, 4.3, 5.3, 6.9, 8.6, 11.3, 13.9, 18.2]  
[3.3, 3.8, 4.8, 5.3, 6.1, 7.8, 8.6, 9.9, 12.6, 13.9, 16.1, 20.4,  
22.6]
```

Using Docker

Alternatively, maybe you want to run it through Docker because, in the production environment, Docker will be used to run the application. So, to do this, I provide a [Bash script](#).

Yeah ... I know ... its simple to run a Docker command (if it has few parameters) but keep in mind: as I said in my goals, I simply love the [KISS principle](#) because I don't have to much space in my head to remember all the details that I study in many technologies. To solve this problem, I write and use scripts are the best alternatives because, sometimes, I can read and interpret it immediately in my head without even invoking it, like in this case.



Let me tell you another thing: I had a job interview another day. In that interview, I was expecting questions about my past experiences or maybe some about the projects I have published on my GitHub, my point of view on DevOps, how and why I automate things, etc. But, instead of doing these questions, the interviewer ignored my years of experience and asked me about minor details related to specific technologies, such as Docker and GitHub Actions. I remember one of the questions: what does the EXPOSE

command do in a Dockerfile?

Man ... what a foolish question! I know: this is a straightforward question. But I don't think that it is a good question that an interviewer should ask a guy who uses Docker for almost ten years and has thirty years of experience as a developer. Furthermore, I wouldn't say I liked that question because it is tied in with minimal details and was far from the questions I was expecting. Also, today, we can search in Google or even ask ChatGPT, and boom ... if you have some experience, you will remember (or understand) any minor concept like this in a few seconds. In my particular case, I have used Docker since 2014 (you can see [some old videos I published](#) about this then).

In short: I like to keep the minor details inside the scripts that I wrote because I really don't want waste my time thinking about such details. Keeping these details inside scripts leave I can free my mind to think in other (bigger) topics and, if I want to or if was need to, I can read the script (to remember or update it).

So, this is another "KISS script" to build and run a Docker container for this application:

```
$ cat scripts/docker.sh
#!/usr/bin/env bash
set -eou pipefail

BASE_DIR=${BASE_DIR:-...}
cd "`dirname \"$0\"`/$BASE_DIR"
source ./scripts/common.sh

case "${1:-}" in
  build)
    docker build -t $project_name .
    ;;
  run)
    docker run --rm $project_name
    ;;
esac
```

To build the container, type:

```
$ ./scripts/docker.sh build
```

To run the built container, type:

```
$ ./scripts/docker.sh run
```

5.2.7. Deactivating the environment

```
$ deactivate # <- will deactivate the virtual environment
```

Get your copy
of this ebook to free
the links inside it
(details after the cover)

5.2.8. Cleaning the project directory

Alternative 1:

```
$ ./scripts/clean.sh # <- call a script to clean generated files  
without destroying the virtual environment.
```

Alternative 2:

```
$ ./scripts/clean.sh all # <- should be the same effect as a call to  
'git clean -fdX'.
```

5.3. Tutorial: Learn how to rebuild this app from scratch



Take it easy, "Wellness Hacker"! If you stopped here by clicking [the link on the first page](#), return to the [Introduction](#) because I gave you some important information there. That said, let's move on.

Now that we know all the [Technical details](#) about how to run [This version](#) of the application in our [development environment](#), it's time to rebuild this app from scratch.

Let's start by creating the minimal structure to code a Python program that we'll be refactoring in a moment. As said, we want to rebuild this software entirely from nothing. So, we need to create a new directory for this app:

```
$ mkdir -p ~/tmp/tptppa
```



Section under construction.