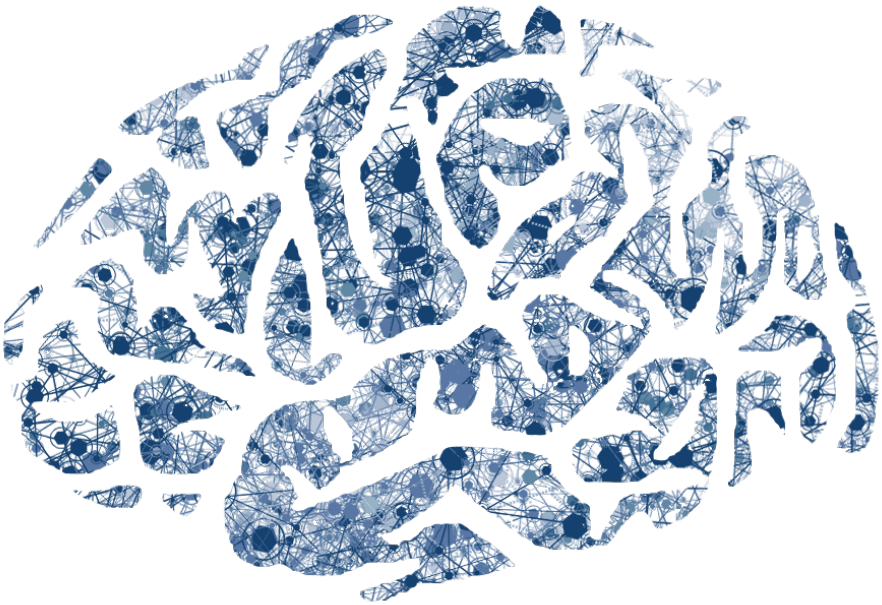


BREBEUFHX

HACKER BOOKLET

2021

CONTENTS

CONTENTS

Bienvenue au guide de programmation de BrébeufHx! Ce catalogue peut vous servir pour vous préparer pour le hackathon, mais il peut aussi vous être utile pour apprendre ou pour vous améliorer en programmation, même si vous n'avez pas pu assister au hackathon. Pour vous aider, nous avons inclu des suggestions pour chaque langage de programmation, ainsi que ce que vous devez faire pour vous améliorer. Ensuite, nous avons intégré des liens qui vous dirigent vers des ressources en ligne qui peuvent vous aider. Pour faciliter l'utilisation de ce guide, nous l'avons séparé en de nombreuses parties qui vous pouvez trouver dans la table des matières. Pour chaque partie, nous avons aussi inscrit les exigences que ces types de programmes ont, du niveau des compétences qu'il te faut avoir, ainsi que les matériaux qui y sont requis.

Welcome to the BrébeufHx programming guide! This catalog can be used to prepare you for the hackathon, but it can also be useful for learning or improving your programming, even if you were unable to attend the hackathon. To help you, we have included suggestions for each programming language, as well as what you need to do to improve yourself. Then we have integrated links that direct you to online resources that can help you. Furthermore, to make this guide easier to use, we have separated it into many parts which you can find in the table of contents. For each part, we have also listed the requirements that these types of programs have, the level of skills you need, as well as the materials that are required.

Quelques définitions/ Definitions

Francais

Programme: Fichier ou ensemble de fichiers qui dicte(nt) à l'ordinateur une suite d'opérations à exécuter. Cette suite d'opérations doit être précise : elle ne doit pas laisser place à des ambiguïtés ou à des opérations qui n'ont pas déjà été définies.

Opération: Action unitaire effectuée par l'ordinateur : par exemple, lire ou écrire une valeur en mémoire, effectuer un calcul, etc.

Exécution: Action d'indiquer à l'ordinateur de commencer un programme.

Code: Série d'instructions écrite dans un fichier texte traduisant les opérations à effectuer dans un programme. Le code n'est pas lui-même le programme. Il doit être transformé vers un fichier exécutable (comme en Java, Python, etc.), ou interprété par un autre programme (aussi, de façon cachée, comme en Python).

Quelques définitions/ Definitions

English

Program: file or multiple files that dictates to the computer a series of operations to be performed. This sequence of operations must be precise: it must not give way to ambiguities or operations that have not already been defined.

Computer: Unit Action Operation: for example, reading or writing a value in memory, performing a calculation, etc.

Run: Action to tell the computer to start a program.

Code: Series of instructions written in a text file translating the operations to be performed in a program. The code is not itself the program. It must be transformed to an executable file (as in Java, Python, etc.), or interpreted by another program (also, in a hidden way, as in Python).

"**Object-oriented Programming** is a way to classify code based on the concept of objects—in other words, data created for specific functions. The idea is that no other part of the code can access data within a function, benefitting programmers by enabling them to create new objects based on existing ones and making them easier to modify", Coursera.

Python (français)

Pourquoi Python?

Python est un des langages de programmation les plus populaires au monde. Un des avantages de Python est que ce langage a une syntaxe très simple. Par exemple, pour un programme très simple où l'on fait apparaître les mots «Hello World!» sur l'écran, le code sur Python a l'air de ceci:

```
print("Hello World!")
```

Mais en Java le programme a l'air de cela:

```
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello World!");

    }

}
```

Installation

Python peut être installé à partir de ce lien:
https://www.python.org/downloads/

Vous aurez aussi besoin d'un éditeur de code sur lequel vous écrirez votre programme. Voici quelques-uns qui sont gratuits:

1. **Python IDLE:** Inclus quand vous installez Python, le IDLE de Python n'est pas très performant, mais il fait l'affaire si vous ne codez pas souvent avec Python. Cependant, si vous l'utilisiez souvent, nous vous recommendons d'utiliser une des options suivantes.

2. **Pycharm Community Edition (recommandé):** Un des éditeurs gratuits les plus performants. Utilisez ce lien pour installer: https://www.jetbrains.com/pycharm/download/

3. **Visual Studio Code:** Un autre éditeur très populaire, Visual Studio Code a été créé par Microsoft et offre plusieurs services. https://code.visualstudio.com/download/

Qu'est-ce que ça veut dire, connaître la base de Python?

Pour pouvoir dire que tu connais la base en Python, il faut que vous puissiez comfortablement utiliser les composantes suivants:

- Input, print
- Ints, floats, strings
- Conditions: if, else
- Loops: for and while loops
- Lists (arrays)
- Functions
- Dictionaries
- Classes si vous voulez faire du object-oriented programming

Ressource pour apprendre Python:
https://snakify.org/fr/

Nous vous recommendons aussi d'utiliser des videos en ligne pour apprendre la programmation.

Puisque les ressources de programmation sont majoritairement en anglais, le reste du guide de programmation BrébeufHx ne sera pas fourni en francais.

Python (English)

Why Python?

Python is one of the most popular programming languages in the world. One of this language's advantages is that its syntax is very simple. For example, for a very basic program where you make the words "Hello World!" appear on the screen, the code for Python would look like this:

```
print("Hello World!")
```

Whereas in Java, the code would look like that:

```
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello World!");

    }

}
```

Installation

Python can be installed from this link:
https://www.python.org/downloads/

You will also need a text editor to write your program on. Here are a few that are free:

1. **Python IDLE:** Included when you install Python, its IDLE isn't very performant, but it works if you don't often code with Python. However, if you use it often, we recommend using one of the following options.

2. **Pycharm Community Edition (recommanded):** One of the most performant free editors. Use this link to install: https://www.jetbrains.com/pycharm/download/

3. **Visual Studio Code:** Another popular text editor, Visual Studio Code was created by Microsoft and offer many services. https://code.visualstudio.com/download/

What does it mean to know Python's basics?

To be able to say that you know Python's basics, you must be able to comfortably use the following:

- Input, print
- Ints, floats, strings
- Conditions: if, else
- Loops: for and while loops
- Lists (arrays)
- Functions
- Dictionaries
- Classes if you are interested in doing object-oriented programming

Visit the "Resources" section to learn Python's basics.

Libraries

After learning the basics of Python, importing libraries to your program is easy and it can help you make your program better. Here are a few examples of Python libraries and what they can do:

- **Requests** and **BeautifulSoup** let you do **web scraping** (take information from a website and add it to your program). However, you must have a basic knowledge of HTML
- **Openpyxl** helps you import or export data from/to Excel files
- **Tesseract OCR** (https://github.com/tesseract-ocr/tesseract) lets you convert an image of a text to text.

- **Pillow** lets you open and edit images.
- **Matplotlib** and **Plotly** can help you make graphs and charts that look great.
- **Tensorflow** is a **machine learning (AI)** library, for advanced programmers.
- **& many, many more**

Installing libraries

To install librarires, you will need to use pip and you might need to download the library from the internet (as for Tesseract). Here are the steps **(you might have to replace "pip" by "pip3")**:

On Windows

To install libraries, you will need to use pip and you might need to download the library from the internet (as for Tesseract). Here are the steps:

1. Choose which library you wish to use
2. In your command prompt, type "pip install " + the name of your library.
3. If step 2 doesn't work, add pip to your PATH. See https://appuals.com/fix-pip-is-not-recognized-as-an-internal-or-external-command/ to add pip to your PATH. Retry step 2 if this doesn't work.
4. If step 3 doesn't work, typing one of these 3 should work: **py -m** pip install + name of the library, **python -m** pip install + name of the library or **python3 -m** pip install + name of the library.

On MacOS

To install libraries, you will need to use pip and you might need to download the library from the internet (as for Tesseract). Here are the steps **(you might have to replace "pip" by "pip3")**:

1. Choose which library you wish to use
2. In your command prompt, type "pip install " + the name of your library.

If you encounter any problems, the best way to remedy them is by searching your error on the Internet.

Resources to learn Python:

- https://snakify.org/en/
- https://www.w3schools.com/python/
- https://www.freecodecamp.org/
- https://www.codecademy.com/ (not free)

We also recommend using online videos to learn programming. Here are a few popular Youtube programming channels.

- freeCodeCamp
- Corey Schafer
- sentdex
- Programming with Mosh

Java 

Java is a programming language that mainly uses object-oriented programming. It is more difficult to understand than Python, which is why we recommend starting with Python if you are a beginner.

Why Java?

Java is a language that is often used in software and app development. Java is also known for being the language used to program Minecraft, as well as many other big-time companies, such as Microsoft and Intel. It is also often used to make Android apps.

Installation

To program in Java, you must download the Java Development Kit (JDK) from this link:
https://www.oracle.com/java/technologies/javase-downloads.html

You will also need a code editor to write your program on. Here are a few that are free:

1. **Netbeans:** https://netbeans.apache.org/download/index.html
2. **IntelliJ IDEA Community Edition:** if you like using Pycharm, this is its equivalent for Java. Use this link to install: https://www.jetbrains.com/idea/download/
3. **Eclipse:** https://www.eclipse.org/downloads/

Resources to learn Java:

- https://www.w3schools.com/java/
- https://www.freecodecamp.org/
- https://www.codecademy.com/ (not free)

We also recommend using online videos to learn programming. Here are a few popular Youtube programming channels.

- freeCodeCamp
- Thenewboston
- Derek Banas
- Programming with Mosh
- Telusko

Web development

HTML (Hypertext Markup Language)

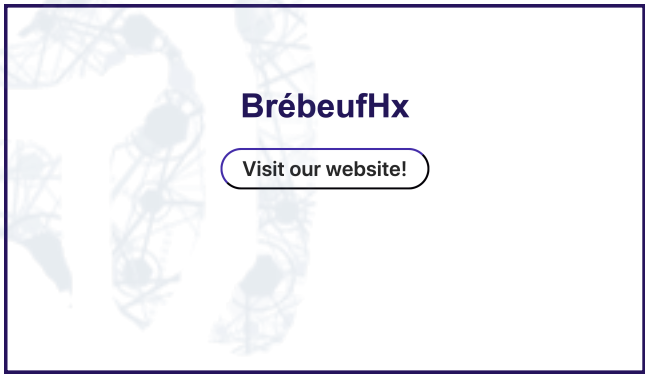
HTML is the must-learn for web development. It is used to make web pages.

CSS (Cascading Style Sheets)

CSS describes the style of a Web page, as well as how the elements should be desplayed on it. Here's an example of a Web page with and without CSS:

Without CSS

With CSS



Javascript

Javascript helps you make your website interactive.

Django

Django is a web development tool that runs on Python and HTML/CSS. You must have a basic knowledge in Python to use Django. Instagram, Spotify, Youtube, Mozilla, Nasa's website, Prezi, National Geographic & more use Django to build their websites. Django is more powerful than Flask and has more built-in features, but is a bit more complicated to learn.

Flask 

Flask is a web development tool that runs on Python and HTML/CSS. It is less powerful than Django and is more difficult to use if you need to have an user authentication system or a database in your website. However, it is less complicated than Django for simpler tasks.

PHP 

PHP is a programming language that is made for web development. It is used by 80% of the web. Yahoo, Facebook, Wikipedia, and more use PHP to build their websites. However, like any other web development tool, you must be able to code in HTML/CSS in order to use PHP.

Web development resources

- https://www.w3schools.com/
- https://www.freecodecamp.org/
- https://www.codecademy.com/ (not free)

We also recommend using online videos to learn programming. Here are a few popular Youtube programming channels.

- freeCodeCamp (HTML, CSS, Javascript, Django, Flask, PHP)
- Traversy Media (HTML, CSS, Javascript, Django, Flask, PHP)
- mmtuts (HTML, CSS, Javascript, PHP)
- EJ Media (HTML, CSS, Javascript, PHP)
- Corey Schafer (Django, Flask)

App development

There are many platforms you can use to create an app. However, the most popular are Android Studio (for Android apps) and Xcode (for apps from Apple devices).

Android Studio 

Android Studio is the official IDE (text editor) for Android app development and it uses Java (or Kotlin).

Xcode 

Xcode is the official IDE (text editor) for Apple app development. It runs using Apple's own programming language, Swift. However, Xode can only be installed on a Mac device.

App development resources

- https://developer.android.com/studio/intro (Android)
- https://www.freecodecamp.org/
- https://www.codecademy.com/ (not free)
- https://developer.apple.com/swift/resources/ (Swift)

We also recommend using online videos to learn programming. Here are a few popular Youtube programming channels.

- freeCodeCamp (Android and Swift)
- Thenewboston (Android)
- CodeWithChris (Swift)
- Brian Advent (Swift)

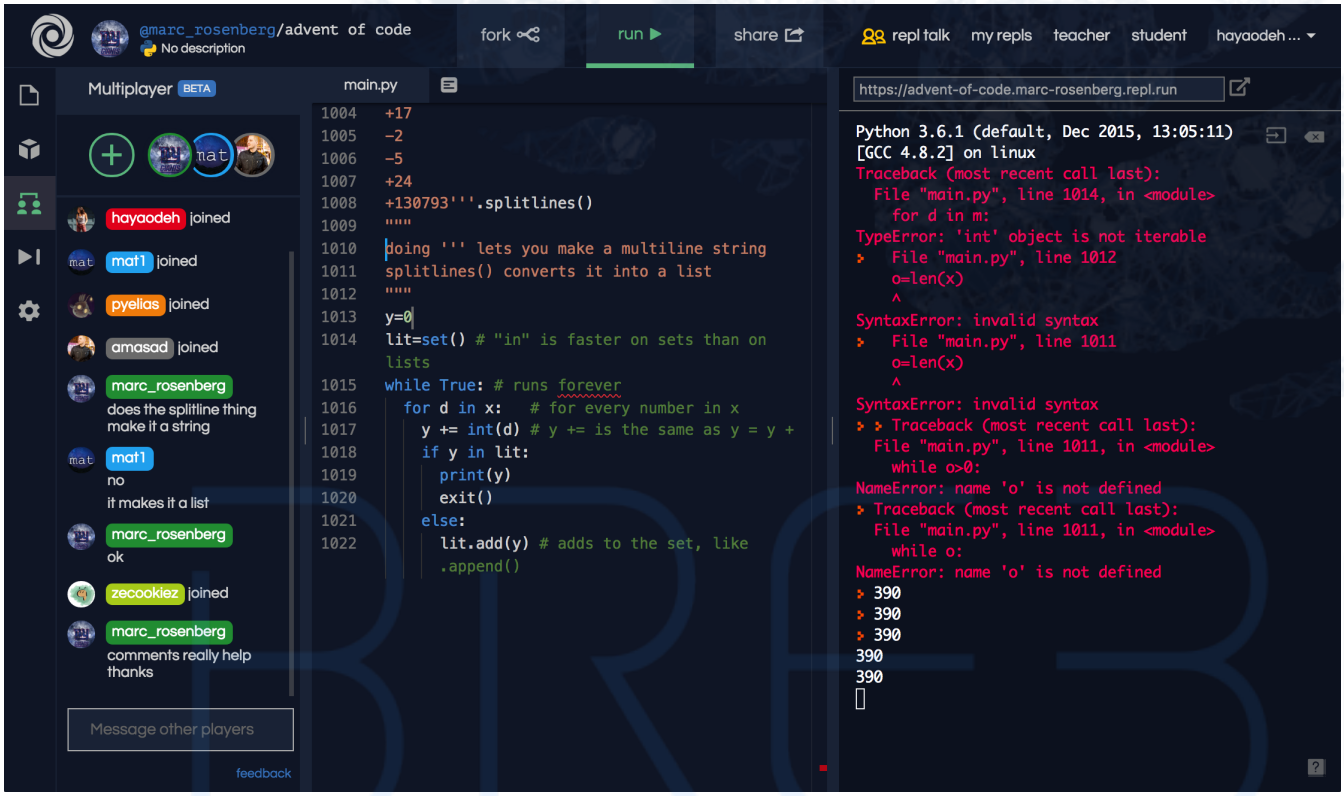
Programming tools

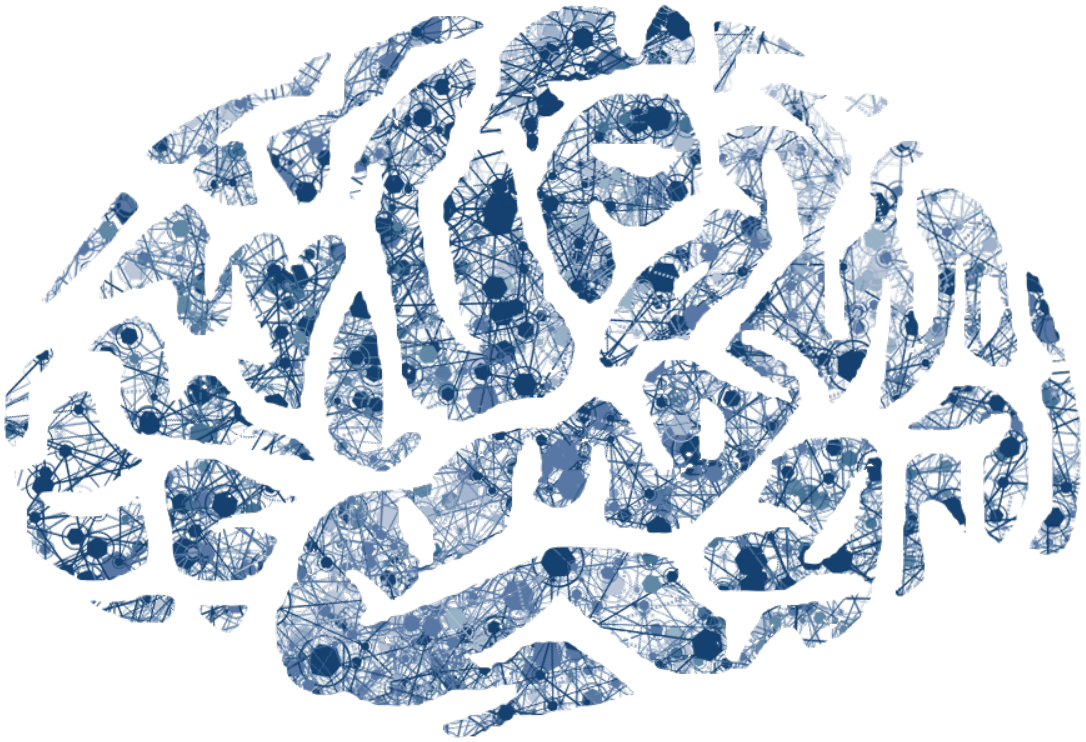
GitHub (https://github.com)

GitHub is an excellent way to store and share your code, very similar to Google Drive. It is often used when multiple coders who want to build a single program, together. There's also a "history", which enables you to access the older versions your program. To use GitHub, you must first create an account at: https://github.com/join?source=header-home. After, follow the steps from GitHub's guide (https://guides.github.com) to familiarize yourself with this tool.

Repl.it (https://repl.it)

Repl.it is an online IDE (text editor) that lets you work on a program online. The difference to GitHub is that you can directly run your code online, whereas GitHub can only store your program. Also, when working as a team, your edits on your program are live, the same way Google Docs documents are. Here's how a Repl program looks like:





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