Lab 2

Yapi D

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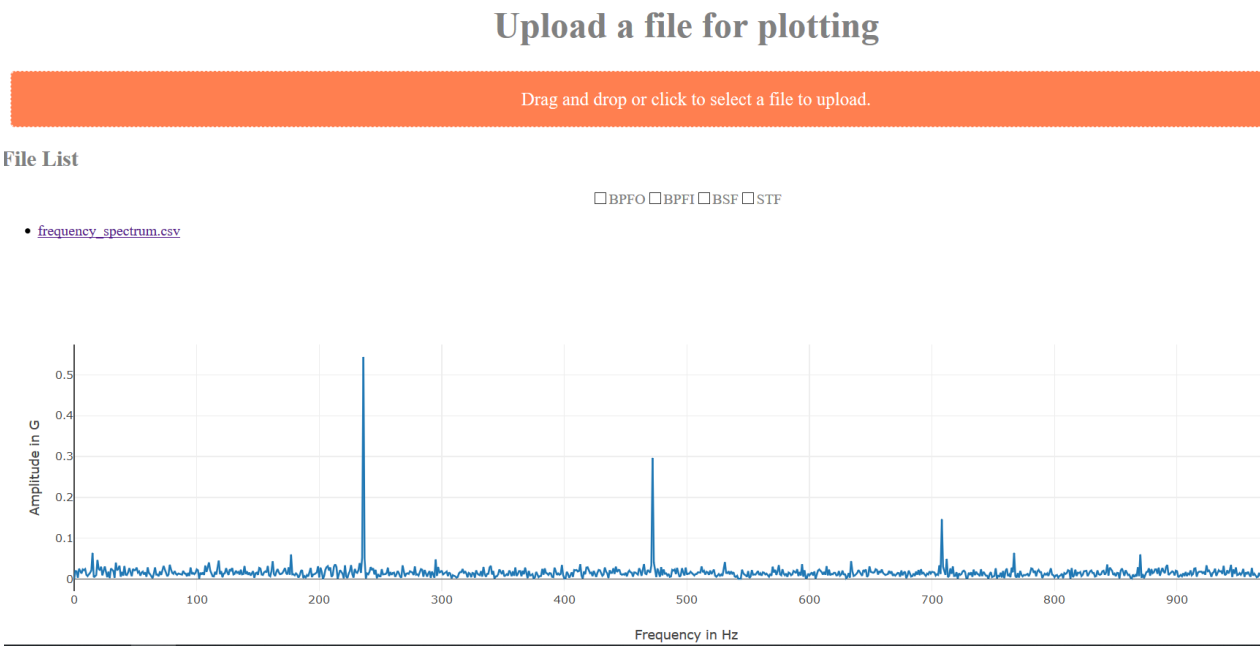
1 Function and string

In this lab you will learn about functions that take arguments and return something. I encourage you to bring an extra bigger screen. It will make programming easier for you in this lab.

You will learn how to import your function in an other python file. You will write two functions: the first function will take a table as argument and return two parameters (frequency and amplitude data).

The second function will return two strings representing the x label and the y label for a plot. Then you will import both functions into a dashboard program. We will be using the python dashboard library called dash. So we need to install it. The user will upload a file into the dashboard and the dashboard should show the plot as bellow



1.1 First push the code of lab 1 on github

You start this lab by pushing the code you wrote on lab 1 on github.

```
#add all your code on git
$ git add -A

#tell git that you are sure about adding the files
$ git commit -m "I am adding my code bla bla bla"

#push your code on the git server
 $ git push
```

1.2 Create a virtual environment and install packages

```
# create a virtual environment called lab2-env
$ python -m venv lab2-env

# if you get an error copy past this scrit
$ Set-ExecutionPolicy Unrestricted -Scope CurrentUser

# activate your virtual environement
$ lab2-env\Scripts\activate

# go inside you workiing directory
$ cd path\to\working\directory

# create a file called requirements
$ New-Item requirement.txt

# install some packages
$ pip install numpy
$ pip install pandas
$ pip install dash
$ pip install flask
$ pip install plotly
$ pip install dash_core_components
$ pip install dash_html_components
```

1.3 Function returning something, and list

So far we have seen functions that print something. Now we will write functions that return something

```
# a funtion that returns a string
def get_name():
  name = "Yapi"
  return name

# now call the function and print
name = get_name()
print(name)
```

```
# a funtion that returns two strings
def get_name_and_job():
name = "Yapi"
job = "Astronaut"
return name, job

# now call the function and print
name, job = get_name_and_job()
print(name, job)
message = "{} is an {}".format(name, job)
print(message)
```

Today we will learn about python list. A list is a collection of items in a square bracket:

```
# alist of number
my_list = [1,2,3,4,4]
# a list of strings
my_strings_list = ["bla", "blabla", "cool", "yes"]
```

the place of each item in a list is called index. for example "bla" is at index 0, "blabla" is at index 1, "cool" is at index 2 and "yes" is at index 3. You can access an item of a list by specifying its index like this :

```
my_strings_list[0], my_strings_list[1]
```

One import function to split list in python is the function called split()

```
def split_list(string):
  """
  This function take a a string
  as argument, split it and return
  a list of substrings.
  """
  strings_list = string.split()
  return strings_list

# call the function and print:
string = "What is happening here guys"
string_list = split_list(string)
print(string_list)
print(string_list[0])
print(string_list[1])
print(string_list[-1])
```

```
def split_list2(string):
"""
This function take a a string
as argument, split it and return
a list of substrings.
"""
strings_list = string.split("/")
return strings_list

# call the function and print:
string = "What/is/happening/here/guys"
string_list = split_list(string)
print(string_list)
print(string_list[0])
print(string_list[1])
print(string_list[-1])
```

1.4 Exercise

Write a function that return the strings "Amplitude in G" and "Frequency in Hz"

1.5 Exercise

write a function that takes a table as argument and return frequency and amplitude data. use the functions you wrote in lab1.

2 Import function in an other python file

1. In your working directory, create a file called get_data.py

```
  $ New-item get_data.py

```

2. in powershell run the file dashboard.py

```
$ python dashboard.py
copy http://127.0.0.1:8888/ and past it in your browser
```

3. copy and past the two functions that you created in exercise 1.4 and 1.5 in the file get_data.py dont forget to import pandas.

4. go to the file dashboard.py and at the top import the two functions from the file get_data.py

```
$ from get_data import function_number1, function_number2
```

5. go in the file dashboad.py scroll down until you see : This is the function you need to update. Call your functions, and go to the dashboard to upload your file (the one we used last time) Now you should see a plot of the frequency spectrum in the dashboard.