

Institut Universitaire des Sciences - IUS

Faculté des Sciences et Technologie - FST

Rapport du Td1 Mathématiques

Préparé par Robaldo BADIO

Soumis au chargé de cours Ismael ST-AMOUR

Date Le 15 / 04 / 2025 Installation de Jupyter notebook

```
C:\Users\ROBALDO BADIO>python --version
Python 3.13.3

C:\Users\ROBALDO BADIO>pip install notebook
Collecting notebook
  Downloading notebook-7.4.0-py3-none-any.whl.metadata (10 kB)
Collecting jupyter-server<3,>=2.4.0 (from notebook)
  Downloading jupyter_server-2.15.0-py3-none-any.whl.metadata (8.4 kB)
Collecting jupyterlab-server<3,>=2.27.1 (from notebook)
  Downloading jupyterlab_server-2.27.3-py3-none-any.whl.metadata (5.9 kB)
Collecting jupyterlab<4.5,>=4.4.0rc0 (from notebook)
  Downloading jupyterlab-4.4.0-py3-none-any.whl.metadata (16 kB)
Collecting notebook-shim<0.3,>=0.2 (from notebook)
  Downloading notebook_shim-0.2.4-py3-none-any.whl.metadata (4.0 kB)
Collecting tornado>=6.2.0 (from notebook)
  Downloading tornado-6.4.2-cp38-abi3-win_amd64.whl.metadata (2.6 kB)
Collecting anyio>=3.1.0 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading anyio-4.9.0-py3-none-any.whl.metadata (4.7 kB)
Collecting argon2-cffi>=21.1 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading argon2_cffi-23.1.0-py3-none-any.whl.metadata (5.2 kB)
Collecting jinja2>=3.0.3 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading jinja2-3.1.6-py3-none-any.whl.metadata (2.9 kB)
Collecting jupyter-client>=7.4.4 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading jupyter_client-8.6.3-py3-none-any.whl.metadata (8.3 kB)
Collecting jupyter-core!=5.0.*,>=4.12 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading jupyter_core-5.7.2-py3-none-any.whl.metadata (3.4 kB)
Collecting jupyter-events>=0.11.0 (from jupyter-server<3,>=2.4.0->notebook)
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Collecting jupyter-server-terminals>=0.4.4 (from jupyter-server<3,>=2.4.0->notebook)
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Collecting nbformat>=5.3.0 (from jupyter-server<3,>=2.4.0->notebook)
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Collecting overrides>=5.0 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading overrides-7.7.0-py3-none-any.whl.metadata (5.8 kB)
Collecting packaging>=22.0 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading packaging-25.0-py3-none-any.whl.metadata (3.3 kB)
Collecting prometheus-client>=0.9 (from jupyter-server<3,>=2.4.0->notebook)
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Collecting pyzmq>=24 (from jupyter-server<3,>=2.4.0->notebook)
  Downloading pyzmq-26.4.0-cp313-cp313-win_amd64.whl.metadata (6.0 kB)
Collecting send2trash>=1.8.2 (from jupyter-server<3,>=2.4.0->notebook)
```

```
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Downloading jupyter_server-2.15.0-py3-none-any.whl (385 kB)
Downloading jupyterlab-4.4.0-py3-none-any.whl (12.3 MB)
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Downloading notebook_shim-0.2.4-py3-none-any.whl (13 kB)
Downloading tornado-6.4.2-cp38-abi3-win_amd64.whl (438 kB)
Downloading anyio-4.9.0-py3-none-any.whl (100 kB)
Downloading argon2_cffi-23.1.0-py3-none-any.whl (15 kB)
Downloading async_lru-2.0.5-py3-none-any.whl (6.1 kB)
Downloading babel-2.17.0-py3-none-any.whl (10.2 MB)
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Downloading Jinja2-3.1.6-py3-none-any.whl (134 kB)
Downloading json5-0.12.0-py3-none-any.whl (36 kB)
Downloading jsonschema-4.23.0-py3-none-any.whl (88 kB)
Downloading jupyter_client-8.6.3-py3-none-any.whl (106 kB)
Downloading jupyter_core-5.7.2-py3-none-any.whl (28 kB)
Downloading jupyter_events-0.12.0-py3-none-any.whl (19 kB)
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Downloading jupyter_server_terminals-0.5.3-py3-none-any.whl (13 kB)
Downloading nbconvert-7.16.6-py3-none-any.whl (258 kB)
Downloading nbformat-5.10.4-py3-none-any.whl (78 kB)
Downloading overrides-7.7.0-py3-none-any.whl (17 kB)
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s, cffi, beautifulsoup4, anyio, jupyter-server-terminals, jupyter-client, jsonschema-specifications, inpython, httpx, arrow, argon2-cffi-bindings, jsonschema, iso
nt, jupyter-events, nbconvert, jupyter-server, notebook-shim, jupyterlab-server, jupyter-lsp, jupyterlab, notebook
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ent-8.6.3 jupyter-core-5.7.2 jupyter-events-0.12.0 jupyter-lsp-2.2.5 jupyter-server-2.15.0 jupyter-server-terminals-0.5.3 jupyterlab-4.4.0 jupyterlab-pygments-0.
7 mistune-3.1.3 nbclient-0.10.2 nbconvert-7.16.6 nbformat-5.10.4 nest-asyncio-1.6.0 notebook-7.4.0 notebook-shim-0.2.4 overrides-7.7.0 packaging-25.0 pandocfilt
s-client-0.21.1 prompt-toolkit-3.0.51 psutil-7.0.0 pure-eval-0.2.3 pycparser-2.22 pygments-2.19.1 python-dateutil-2.9.0.post0 python-json-logger-3.3.0 pywin32-310
ning-0.36.2 requests-2.32.3 rfc3339-validator-0.1.4 rfc3986-validator-0.1.1 rpds-py-0.24.0 send2trash-1.8.3 setuptools-79.0.0 six-1.17.0 sniffio-1.3.1 soupsieve
4.0 tornado-6.4.2 traitlets-5.14.3 types-python-dateutil-2.9.0.20241206 typing-extensions-4.13.2 uri-template-1.3.0 urllib3-2.4.0 wcwidth-0.2.13 webcolors-24.11.
C:\Users\ROBALDO BADIO>
```

Écris un programme qui convertit un nombre décimal en hexadécimal en deman-
dant à l'utilisateur de saisir ce nombre.

```
decimal = int (input ("Entrer un nombre décimal"))
hexad = hex(decimal)
print(f"{decimal} en hexadécimal est {hexad[2:].upper()}")
```

Entrer un nombre décimal 344

344 en hexadécimal est 158

Écris un programme qui convertit un nombre hexadécimal en décimal en deman-
dant à l'utilisateur de saisir ce nombre.

```
hexad = input ("Entrer une valeur hexadécimal")
```

```
decimal = int(hexad, 16)
print(f"{hexad} en décimal est {decimal}")
```

Entrer une valeur hexadécimal 3F

3F en décimal est 63

Créer un fichier CSV dans Python, charger le et l'afficher

```
import pandas as pd
```

```
data = {
    "Nom": ["Naguiby", "Jameson", "Peterson", "Beatrice", "Yann"],
    "Sexe": ["M", "M", "M", "F", "M"],
    "Zone": ["Zoranje", "Monchil", "Siloe", "Bois Beuf", "Civadier"]
}
```

```
df = pd.DataFrame(data)
```

```
df.to_csv("etudiantL3.csv", index=False)
print("Fichier CSV créé avec succès !")
```

Fichier CSV créé avec succès !

```
df = pd.read_csv("etudiantL3.csv")
print(df.head())
```

| | Nom | Sexe | Zone |
|---|----------|------|-----------|
| 0 | Naguiby | M | Zoranje |
| 1 | Jameson | M | Monchil |
| 2 | Peterson | M | Siloe |
| 3 | Beatrice | F | Bois Beuf |
| 4 | Yann | M | Civadier |

Créer grande base de données (5000+ lignes) aléatoires

```
import pandas as pd
import numpy as np
from faker import Faker
fake = Faker()
```

```
n = 5000
```

```
data = {
    'ID': np.arange(1, n+1), # ID de 1 à 5000
    'Nom': [fake.name() for _ in range(n)],
    'Âge': np.random.randint(17, 65, size=n),
    'Ville': [fake.city() for _ in range(n)],
    'Email': [fake.email() for _ in range(n)],
}
```

```

'Date Inscription': [fake.date_this_decade() for _ in range(n)]
}

df = pd.DataFrame(data)

df.to_excel('grande_base_de_donnees.xlsx', index=False, engine='openpyxl')
print("Fichier Excel de 5000 entrées généré avec succès !")

Fichier Excel de 5000 entrées généré avec succès !

Créer 3Graphes

Graphe1

import matplotlib.pyplot as plt
# Données
x = [1, 2, 3, 4, 5]
y = [10, 20, 15, 25, 30]

plt.plot(x, y, marker='o', linestyle='-', color='r', label="Croissance")

plt.xlabel("Temps (jours)")

plt.ylabel("Valeur")
plt.title("Évolution de la valeur en fonction du temps")
plt.legend()

plt.show()

Graphe2

categories = ["A", "B", "C", "D"]
valeurs = [20, 35, 30, 40]

plt.bar(categories, valeurs, color='green')
plt.xlabel("Catégories")
plt.ylabel("Valeurs")
plt.title("Comparaison des catégories")
plt.show()

Graphe3

import matplotlib.pyplot as plt
import numpy as np
from mpl_toolkits.mplot3d import Axes3D
# Générer une grille pour X et Y
x = np.linspace(-5, 5, 100)
y = np.linspace(-5, 5, 100)
X, Y = np.meshgrid(x, y)
# Définir la fonction Z (par exemple, une surface sinusoïdale)

```

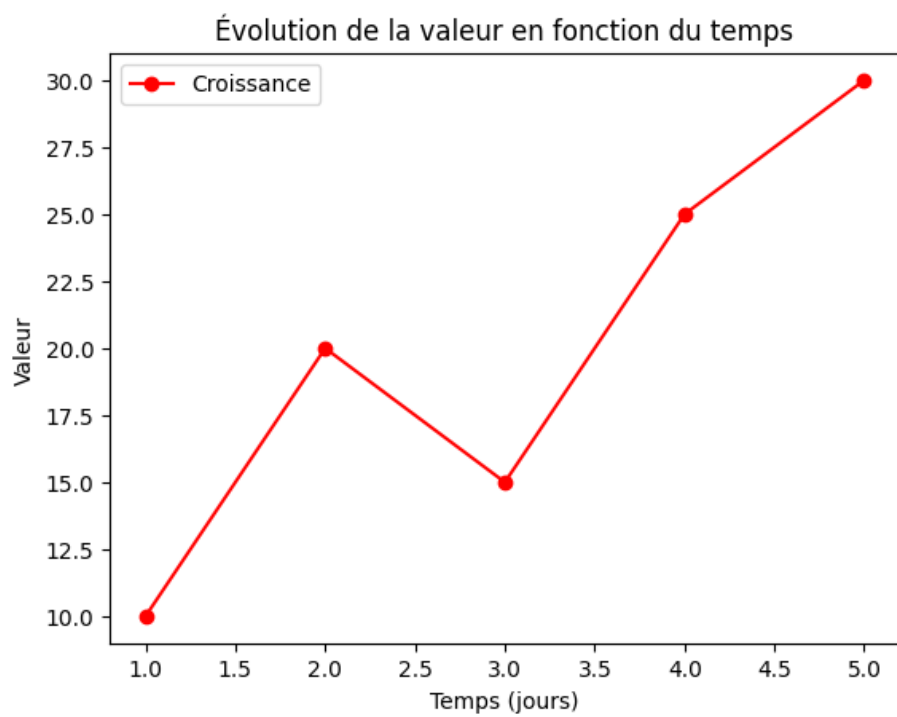


Figure 1: png

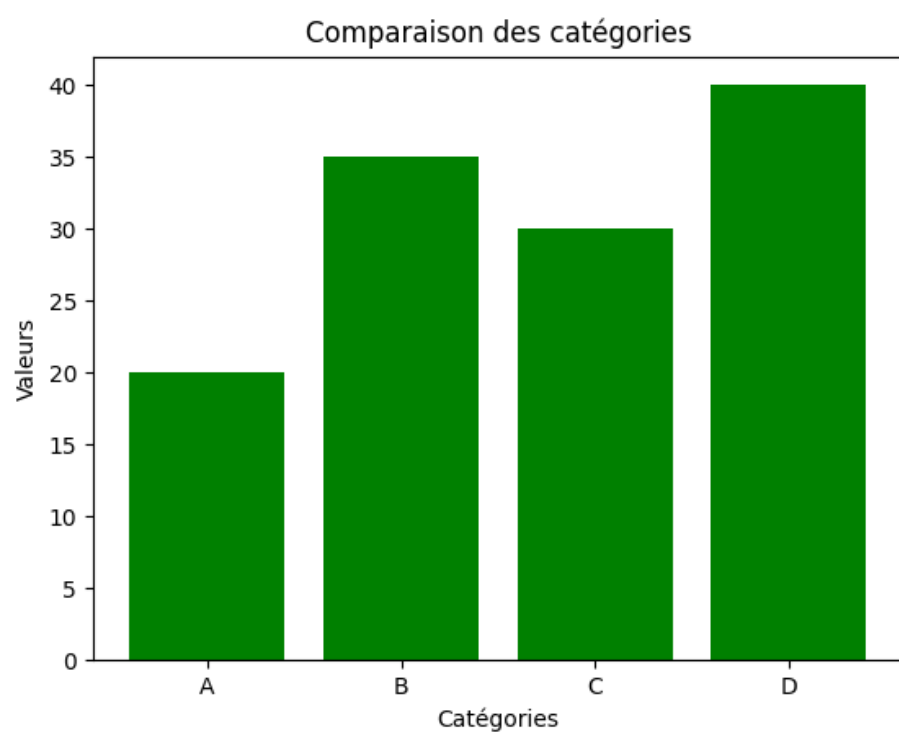


Figure 2: png

```

Z = np.sin(np.sqrt(X**2 + Y**2))
# Créer la figure et le subplot 3D
fig = plt.figure(figsize=(8, 6))
ax = fig.add_subplot(111, projection='3d')
# Tracer les contours 3D
ax.contour3D(X, Y, Z, 50, cmap='viridis')
# Ajouter des labels et titre
ax.set_xlabel("X")
ax.set_ylabel("Y")
ax.set_zlabel("Z")
ax.set_title("Contours 3D de la fonction  $Z = \sin(\sqrt{X^2 + Y^2})$ ")
plt.show()

```

Contours 3D de la fonction $Z = \sin(\sqrt{X^2 + Y^2})$

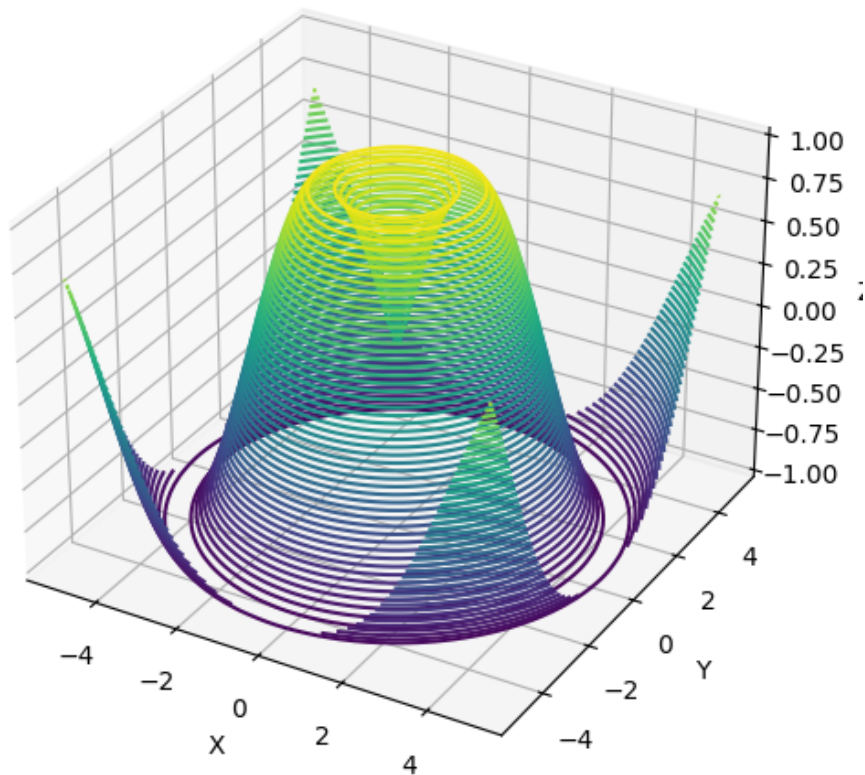


Figure 3: png