IBM_DataScience

March 11, 2024

1 IBM Tools for Data Science - Final Exam

1.1 Introduction

You will be provided with an empty Jupyterlite notebook which you will launch in the course, to complete this assignment. You will need to include a combination of markdown and code cells. You will likely need to use the Markdown cheat sheet to help you determine the appropriate syntax for your markdown.

1.2 Data Science Languages

1. Python
2. R
3. SQL
4. Julia
5. Java
6. Scala
7. MATLAB
8. Go
9. C/C++

1.3 Data Science Libraries

1. NumPy
2. Pandas
3. MatplotLib
4. Seaborn
5. Scikit-learn
6. Keras
7. TensorFlow
8. PyTorch
9. Apache Spark
10. Scala: Vegas
11. Scala: BigDL
12. R: ggplot
13. R: dplyr
14. R: stringr
15. R: caret

1.4 Data Science Tools

ID	Tools	Tag	Description
1	MySQL	Database	Relational database management system (RDBMS).
2	PostgreSQL	Database	Object-relational database system.
3	MongoDB	Database	NoSQL document-oriented database.
4	Apache CouchDB	Database	Distributed NoSQL database.
5	Apache Cassandra	Database	Highly scalable NoSQL database.
6	Hadoop	Big Data	Framework for distributed storage and processing.
7	Spark	Big Data	Fast and general-purpose cluster computing system.
8	AirFlow	Big Data	Platform to programmatically author, schedule, and monitor workflows.
9	KubeFlow	Big Data	Kubernetes-native platform for deploying and managing ML workflows.
10	Nifi	Big Data	Data integration and data flow automation tool.
11	NodeRED	IoT	Flow-based development tool for visual programming.
12	Prometheus	Monitoring	Open-source systems monitoring and alerting toolkit.
13	IBM Explainability 360 toolkit	AI	Toolkit for evaluating and explaining machine learning models.
14	Jupyter (Notebook and labs)	Analytics	Open-source web application for creating and sharing documents with live code, equations, visualizations.
15	RStudio	Analytics	Integrated development environment (IDE) for R.
16	IBM Watson	AI	IBM's AI platform providing various services and tools.
17	Spyder	Analytics	IDE for Python, specifically for scientific computing.
18	Apache Zeppelin	Analytics	Multi-purpose notebook for data exploration and visualization.

1.5 Python Code

[34]:
```
# some examples of arthmetic expr in python
# First, define some numbers
x = 1
y = 2
z = 3
print(x, y, z)
```

```
1 2 3
```

[35]:
```
# Then we can do some basic math on them
a = x + z
b = y + z
c = y * z
print(a, b, c)
```

```
4 5 6
```

[36]:
```
# now we can make even more complex examples
f = 3 * a + 2 * b + 3 * c
g = (a * b * c) + (x + y + z)
h = a ** x + b ** y + c ** z
print(f, g, h)
```

```
40 126 245
```

[37]:
```
# given a number of minutes, convert it to hours and print the string
def minutes_string(minutes):
    print(f'{minutes}m is: ', end='')
    hours = minutes // 60
    min_remain = minutes % 60
    ms = 'minute' if min_remain == 1 else 'minutes'
    if hours == 0:
        print(f'{min_remain} {ms}')
    else:
        hs = 'hour' if hours == 1 else 'hours'

        if min_remain > 0:
            print(f'{hours} {hs} and {min_remain} {ms}')
        else:
            print(f'{hours} {hs}')
```

[38]:
```
# Several tests
minutes_string(0)
minutes_string(1)
minutes_string(15)
minutes_string(60)
minutes_string(61)
minutes_string(75)
minutes_string(120)
minutes_string(121)
minutes_string(135)
```

```
0m is: 0 minutes
1m is: 1 minute
15m is: 15 minutes
60m is: 1 hour
61m is: 1 hour and 1 minute
75m is: 1 hour and 15 minutes
```

```
120m is: 2 hours
121m is: 2 hours and 1 minute
135m is: 2 hours and 15 minutes
```

1.6 Exam Objectives

- ☒ Exercise 2 - Create a markdown cell with the title of the notebook. (1 pt)
- ☒ Exercise 3 - Create a markdown cell for an introduction. (1 pt)
- ☒ Exercise 4 - Create a markdown cell to list data science languages. (3 pts)
- ☒ Exercise 5 - Create a markdown cell to list data science libraries. (3 pts)
- ☒ Exercise 6 - Create a markdown cell with a table of Data Science tools. (3 pts)
- ☒ Exercise 7 - Create a markdown cell introducing arithmetic expression examples. (1 pt)
- ☒ Exercise 8 - Create a code cell to multiply and add numbers. (2 pts)
- ☒ Exercise 9 - Create a code cell to convert minutes to hours. (2 pts)
- ☒ Exercise 10 -Insert a markdown cell to list Objectives. (3 pts)
- ☒ Exercise 11 - Create a markdown cell to indicate the Author's name. (2 pts)
- ☒ Exercise 12 - Share your notebook through GitHub (3 pts)
- ☒ Exercise 13 - Take a screenshot of the first page of the notebook. (1 pt)

2 Author

2.1 Enzo Ferber