

CIS 350: AI for Cybersecurity

Activity 1 Worksheet: Python & Google Colab Tutorial

Activity Overview

This worksheet guides you through 5 hands-on coding challenges in Google Colab. By completing these challenges, you'll gain confidence with Python syntax, data loading, and basic visualization - skills you'll use in all future labs.
Expected time: 30-40 minutes

Warm-Up (5 min): Predict Before You Code

Before you open Colab, think on your own for 60 seconds, then compare with a partner. Jot a quick prediction for each question below - you will check your guesses against the real output later (see Q5).

1. Of these three passwords - 'weak', 'StrongPass123', 'qwerty' - how many do you think count as strong (8 or more characters)?
2. In a list of leaked passwords, what do you predict is the most common password length (in characters)?

Challenge 1: Print a Message

Create a code cell and run this simple Python command:

```
message = "Hello, CIS 350!"  
print(message)
```

What did you see? Write your output below:

Challenge 2: Variables and Math

Create variables and perform calculations:

```
password_length = 8  
repeated_count = 3  
total = password_length * repeated_count  
print(f'Total: {total}')
```

What is the total? Write your answer below:

Challenge 3: Lists and Loops

Work with lists and loop through them:

```
passwords = ['weak', 'StrongPass123', 'qwerty']
for pwd in passwords:
    print(pwd)
    if len(pwd) >= 8:
        print(' -> This one is strong!')
```

How many strong passwords? Write your answer:

Checkpoint: Discuss with a Partner (2 min)

Before moving on, compare notebooks with a partner. Did you both get the same output for Challenges 1-3? If either of you hit an error (for example a NameError or an indentation error), read the error message out loud and explain to each other what it meant and how you fixed it.

Challenge 4: Load Real Data

Load a CSV file and inspect it:

```
import pandas as pd
url = 'https://raw.githubusercontent.com/AbdunabiRamadan/AI-Cybersecurity-Course/main/lab/lab-01/data.csv'
df = pd.read_csv(url)
print(df.head())
print(f'Dataset has {len(df)} rows and {len(df.columns)} columns')
```

How many rows does the dataset have? Write your answer:

Challenge 5: Create a Histogram

Visualize data from Challenge 4:

```
import matplotlib.pyplot as plt
pwd_lengths = df['password_length']
plt.hist(pwd_lengths, bins=20, color='#1E4D2B')
plt.xlabel('Password Length')
plt.ylabel('Frequency')
plt.title('Distribution of Password Lengths')
plt.show()
```

What is the most common password length? Describe your observation:

Reflection Questions

Answer these short-answer questions after completing the challenges. Write 2-3 sentences per question.

Q1: What is Google Colab, and why do we use it?

Q2: Describe the difference between a code cell and a text cell.

Q3: What did you find most challenging about Colab? How did you solve it?

Q4: In Challenge 5, you created a histogram. What does it show you about passwords?

Q5: Look back at your Warm-Up predictions. Which guess was closest to the real result, and which surprised you most?

Grading Rubric (20 points)

Criterion	Description	Points
Completion	All 5 challenges attempted; code cells created and run	10
Correctness	Code runs without errors; outputs are reasonable	5
Reflection	Short-answer questions thoughtfully answered	5

Scoring: Completion = 10 pts, Correctness = 5 pts, Reflection = 5 pts. Total = 20 points.

How to Submit

1. Complete all 5 challenges in your Colab notebook
2. Answer the 5 reflection questions in this worksheet
3. Save your Colab notebook to Google Drive (automatic)
4. Submit this PDF worksheet on Canvas by [DUE DATE]
5. Optional: Share your Colab notebook link on Canvas (File > Share)

Questions? Post in the course discussion forum or attend office hours. We're here to help!