

Lab Task 1

Random noise generation using matplotlib in python.

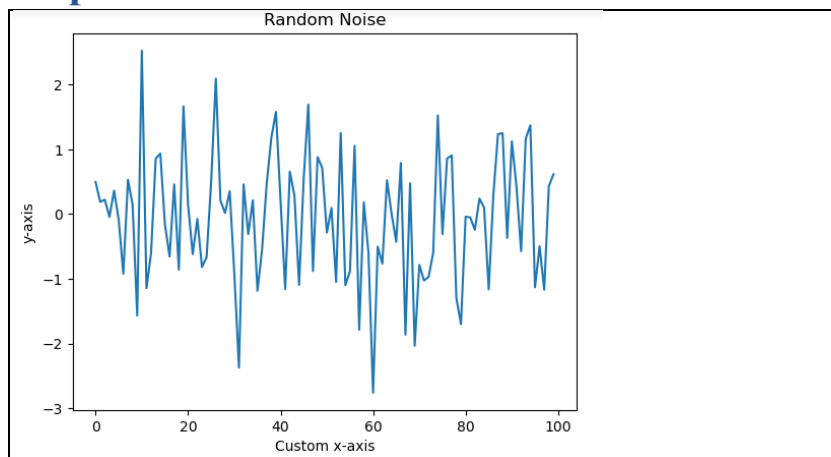
```
import numpy as np
import matplotlib.pyplot as plt

# Generate random data for the y-axis
values = np.random.randn(100)

# Create your own custom x-axis values
x_values = np.arange(100) # This will
create values from 0 to 99

# Plot the data with custom x-axis values
plt.plot(x_values, values)
plt.title("Random Noise")
plt.xlabel('Custom x-axis')
plt.ylabel('y-axis')
plt.show()
```

Output



Lab Task 2

Random number guessing game using random library in python.

```
import random

# Generate a random number
between 1 and 100
random_number =
random.randint(1, 100)

# Initialize the user's score
score = 100

# Ask the user to guess the
number
while True:
    try:
        user_guess =
int(input(f"Guess the number
between 1 and 100 (Your score:
{score}): "))

        if user_guess < 1 or
user_guess > 100:
            print("Please
enter a number between 1 and
100.")
        elif user_guess <
random_number:
            print("Your guess
is smaller than the random
number.")
            score -= 5 #
Deduct 5 points for a wrong
guess
```

```
        elif user_guess >
random_number:
            print("Your guess
is greater than the random
number.")
            score -= 5 #
Deduct 5 points for a wrong
guess
        else:

print(f"Congratulations! You
guessed the correct number.
Your score: {score}")
        break

        # Check if the user's
score has reached zero
        if score <= 0:
            print("Game over.
You ran out of points.")
            break
    except ValueError:
        print("Invalid input. Please
enter a valid number.")
```

Lab Task 3

Next semester **GPA calculation** using current CGPA in python.

```
# Get user input for current CGPA, current semester credit
hours, and desired CGPA
current_cgpa = float(input("Enter your current CGPA: "))
current_semester_credit_hours = int(input("Enter your current
semester credit hours: "))
desired_cgpa = float(input("Enter your desired CGPA: "))

# Constants
total_credit_hours = 95 # Total credit hours required for the
program

# Calculate the current total points and desired total points
current_total_points = current_cgpa * total_credit_hours
desired_total_points = desired_cgpa * total_credit_hours

# Calculate the points needed to attain the desired CGPA
points_needed = desired_total_points - current_total_points

# Calculate the total CGPA required
total_cgpa_required = (current_total_points + points_needed) /
total_credit_hours

# Print the total CGPA required
print(f"To attain a CGPA of {desired_cgpa}, you will need a
total CGPA of {total_cgpa_required:.2f}.")
```

Lab Task 4

GPA Plot each semester using matplotlib in python.

```
import numpy as np
import matplotlib.pyplot as plt

# Generate random CGPA values for 8 semesters
semesters = np.arange(1, 9) # Semesters from 1 to 8
cgpa_values = np.random.uniform(2.0, 4.0, size=8) #
Generate random CGPAs between 2.0 and 4.0

# Plot the CGPA values
plt.figure(figsize=(8, 4))
plt.plot(semesters, cgpa_values, marker='o',
linestyle='-', color='b')
plt.title("CGPA Progress Over 8 Semesters")
plt.xlabel('Semester')
plt.ylabel('CGPA')
plt.grid(True)
plt.xticks(semesters)
plt.ylim(2.0, 4.0) # Set y-axis limits between 2.0 and
4.0
plt.show()
```

Output

