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Github Link- https://github.com/Prabhjot-Singh1/Python-Programming-Laboratory/tree/main/Assignment_3

AI-523 Python Programming Laboratory Assignment 3

Q1) Generate all prime numbers less than 100.Print them in a spiral format (like a clockwise square spiral) of minimal size that fits all primes.

```
import math

# Function to check prime
def is_prime(n):
    if n < 2:
        return False
    for i in range(2, int(math.sqrt(n)) + 1):
        if n % i == 0:
            return False
    return True

# Generate primes < 100
primes = [i for i in range(100) if is_prime(i)]
n = len(primes)

# Find minimal square size
size = math.ceil(math.sqrt(n))
spiral = [[0] * size for _ in range(size)]

# Spiral fill
top, left = 0, 0
bottom, right = size - 1, size - 1
index = 0

while index < n and top <= bottom and left <= right:
    for j in range(left, right + 1):  # left → right
        if index < n:
            spiral[top][j] = primes[index]
            index += 1
    top += 1

    for i in range(top, bottom + 1):  # top → bottom
        if index < n:
            spiral[i][right] = primes[index]
            index += 1
    right -= 1

    for j in range(right, left - 1, -1):  # right → left
        if index < n:
            spiral[bottom][j] = primes[index]
            index += 1
    bottom -= 1

    for i in range(bottom, top - 1, -1):  # bottom → top
        if index < n:
            spiral[i][left] = primes[index]
            index += 1
    left += 1

print("Spiral of primes < 100:")
for row in spiral:
    print(" ".join(f"{x:2d}" if x != 0 else " ." for x in row))
```

```
Spiral of primes < 100:
 2  3  5  7 11
53 59 61 67 13
47 89 97 71 17
43 83 79 73 19
41 37 31 29 23
```

Q2) You are a data analyst at a streaming platform, managing user interactions, analytics, and daily operations. Use a for loop to create a text-based graph of hourly views. For example, use * to represe ✦ very 5 views.

```
# Example hourly views (24 hours)
hourly_views = [10, 25, 40, 12, 50, 5, 0, 15, 30, 20, 45, 60,
                10, 15, 25, 35, 40, 20, 10, 5, 0, 10, 15, 20]

print("\nHourly Views Graph (* = 5 views):")
for i in range(len(hourly_views)):
    views = hourly_views[i]
    stars = "*" * (views // 5)
    print(f"{i:02d}: {stars}")
```

```
Hourly Views Graph (* = 5 views):
00: **
01: *****
02: ********
03: **
04: **********
05: *
06:
07: ***
08: ******
09: ****
10: *********
11: ************
12: **
13: ***
14: *****
15: *******
16: ********
17: ****
18: **
19: *
20:
21: **
22: ***
23: ****
```

Q3) Each video watched generates revenue based on ad impressions: □ First 10 views: $0.50perview□Next20views$:0.30 per view □ Remaining views: $0.10 per view You are given hourly views for the day. Calculate total daily revenue.

```
hourly_views = [10, 25, 40, 12, 50, 5, 0, 15, 30, 20, 45, 60,
                10, 15, 25, 35, 40, 20, 10, 5, 0, 10, 15, 20]

print("\nHourly Views Graph (* = 5 views):")
for i in range(len(hourly_views)):
    views = hourly_views[i]
    stars = "*" * (views // 5)
    print(f"{i:02d}: {stars}")
```

```
Hourly Views Graph (* = 5 views):
00: **
01: *****
02: ********
03: **
04: **********
05: *
06:
07: ***
08: ******
09: ****
10: *********
11: ************
12: **
13: ***
14: *****
15: *******
16: ********
17: ****
18: **
19: *
20:
21: **
22: ***
23: ****
```

```
Start coding or generate with AI.
```