

ALGORITHM TEST #1

Andy works in a plumbing company. He needs to calculate the average value of water volume through a pipe every second. He has a sensor that gives readings V , of water volume and this is updated every second. Write an algorithm that allows him to display A , the average water volume.

Note: The value of V changes every second, so you need to use a loop to update A or M every second.

ANSWER :

Script below is a program I wrote using Python to simulate the calculation of average water volume through a pipe every second.

```
import random
import time

# Greetings
print("This is a program to simulate the calculation of average water volume
through a pipe every second")
input("Press Enter to start\n")

def get_volume_from_sensor():

    # Assume this is a function that return readings V from the sensor
    return random.randrange(1, 1000)

#Preparing variables
second = 0
total_volume = 0

while True:

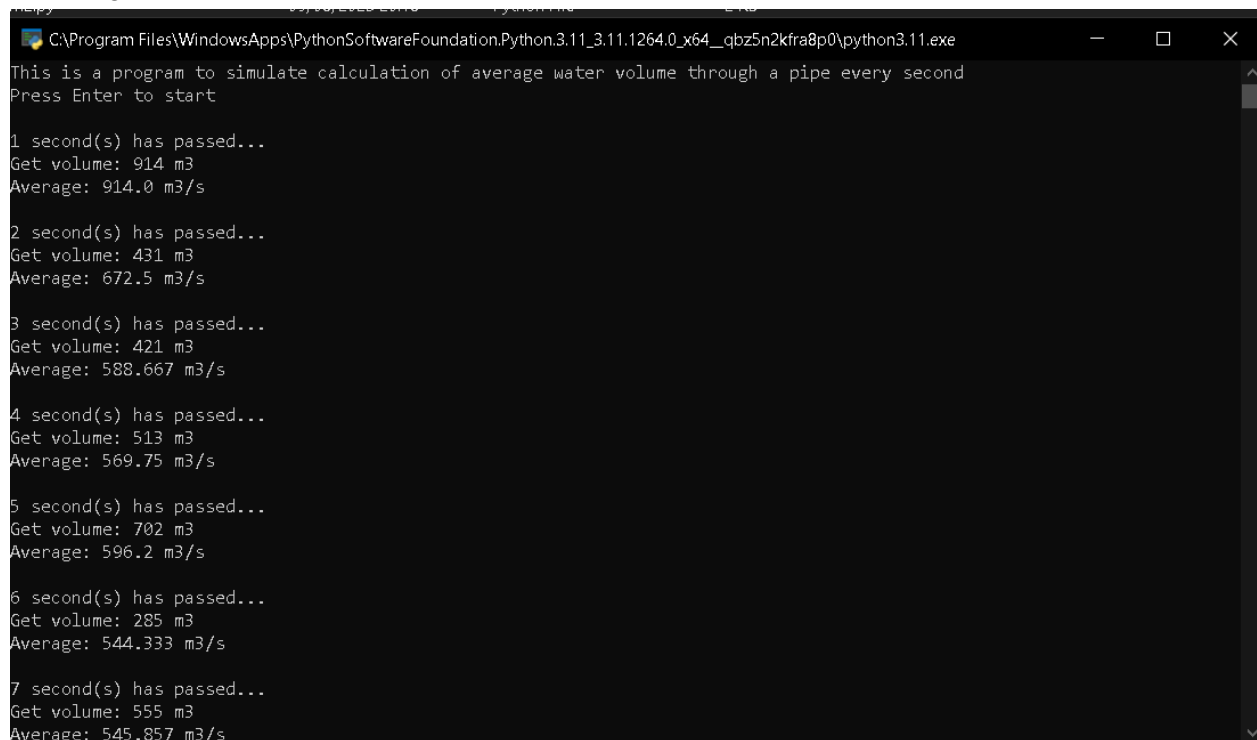
    #Delay every loop for 1 second
    time.sleep(1)

    # Get new volume and calculate the average
    volume = get_volume_from_sensor()
    total_volume += volume
```

```
second += 1
average = total_volume / second

# Represent the results
print(f"{second} second(s) has passed...")
print(f"Get volume: {volume} m3")
print(f"Average: {round(average, 3)} m3/s \n")
```

The program should look like this when executed



The screenshot shows a Windows command prompt window titled "C:\Program Files\WindowsApps\PythonSoftwareFoundation.Python.3.11_3.11.1264.0_x64__qbz5n2kfra8p0\python3.11.exe". The program's output is as follows:

```
This is a program to simulate calculation of average water volume through a pipe every second
Press Enter to start

1 second(s) has passed...
Get volume: 914 m3
Average: 914.0 m3/s

2 second(s) has passed...
Get volume: 431 m3
Average: 672.5 m3/s

3 second(s) has passed...
Get volume: 421 m3
Average: 588.667 m3/s

4 second(s) has passed...
Get volume: 513 m3
Average: 569.75 m3/s

5 second(s) has passed...
Get volume: 702 m3
Average: 596.2 m3/s

6 second(s) has passed...
Get volume: 285 m3
Average: 544.333 m3/s

7 second(s) has passed...
Get volume: 555 m3
Average: 545.857 m3/s
```

After pressing “Enter” key, the program will start to generate a new random value of volume water while assuming it's a reading from a sensor. The average value is also calculated immediately after the value generated. This process will repeat itself every second.