Python project:

Identifying the pollution source through correlation between the indicators

Project Team:

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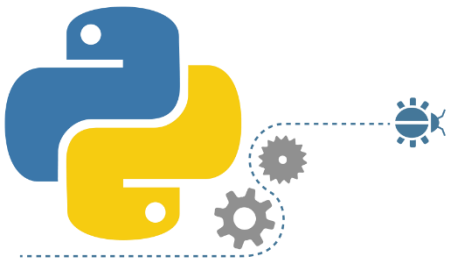

1. Introduction

Using the correlation between indicators to identify pollution sources to assist environmental inspectors on-site in determining the type of pollution and which samples to collect.

Starting with creating the table of the indicators and percentage, will be used as the database of this code.

Table :

	Nitrate	Phosphate	eColi (bacteria)	silicon
Sewage	>95	>89	>200	<900
Construction	<95	<89	<200	>900
Agricultural	>95	>89	<200	>900
Add condition	..	…	..	..

Idea for the code :

- Call the table
- four input for the users to insert.
- Methods , functions : Use if else , for , while , methods , functions break , continue
- Bacteria not a float < condition

Results / output :

1. Sewage effluent
2. Industrial effluent
3. Agricultural effluent

2. The rules/ conditions for the code :

If Nitrate is high , phosphate is high, bacteria is low , silicate is Present

Print: **Agricultural effluent: inspect agricultural sites nearby**

If Nitrate is high , phosphate is low, bacteria is high , silicate is Absent

Print: **Sewage effluent: inspect illegal connections to outlets**

If Nitrate is low , phosphate is low, bacteria is low , silicate is Present

Print: **Dewatering effluent: inspect construction sites nearby**

If Nitrate is high , phosphate is high, bacteria is high , silicate is Present

Print: **Mixed-source effluent: further tests is required**

If Nitrate is low , phosphate is low, bacteria is low , silicate is Absent

Print: **No pollution detected, water is clean**

Else ,

Print: **Unidentified source, Please investigate further.**

3. The python script and the running process

```
nitrate = float(input("Enter Nitrate concentration in µg/L: "))
phosphate = float(input("Enter phosphate concentration in µg/L: "))
bacteria = float(input("Enter the number of bacteria in CFU/100 ml: "))
silicate = input("Presence or absence of Silicate (present/absent): ").strip().lower()  # Ensuring the input is properly formatted

if nitrate >= 95 and phosphate >= 89 and bacteria <= 200 and silicate == "present":
    print("Agricultural effluent: inspect agricultural sites nearby")

elif nitrate >= 95 and phosphate <= 89 and bacteria >= 200 and silicate == "absent":
    print("Sewage effluent: inspect illegal connections to outlets")

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "present":
    print("Dewatering effluent: inspect construction sites nearby")

elif nitrate >= 95 and phosphate >= 89 and bacteria >= 200 and silicate == "present":
    print("Mixed-source effluent: further tests are required")
```

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "absent":

    print("No pollution detected, water is clean")

else:

    print("Unidentified source, please investigate further")

4. Screenshots of running the code in two different conditions as shown below.

```
nitrate = float(input("Enter Nitrate concentration in µg/L: "))
phosphate = float(input("Enter phosphate concentration in µg/L: "))
bacteria = float(input("Enter the number of bacteria in CFU/100 ml: "))
silicate = input("Presence or absence of Silicate (present/absent): ").strip().lower()  # Ensuring the input is properly formatted

if nitrate >= 95 and phosphate >= 89 and bacteria <= 200 and silicate == "present":
    print("Agricultural effluent: inspect agricultural sites nearby")

elif nitrate >= 95 and phosphate <= 89 and bacteria >= 200 and silicate == "absent":
    print("Sewage effluent: inspect illegal connections to outlets")

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "present":
    print("Dewatering effluent: inspect construction sites nearby")

elif nitrate >= 95 and phosphate >= 89 and bacteria >= 200 and silicate == "present":
    print("Mixed-source effluent: further tests are required")

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "absent":
    print("No pollution detected, water is clean")

else:
    print("Unidentified source, please investigate further")
```

```
Enter Nitrate concentration in µg/L: 100
Enter phosphate concentration in µg/L: 20
Enter the number of bacteria in CFU/100 ml: 100
Presence or absence of Silicate (present/absent): absent
Unidentified source, please investigate further
```

```python
nitrate = float(input("Enter Nitrate concentration in µg/L: "))
phosphate = float(input("Enter phosphate concentration in µg/L: "))
bacteria = float(input("Enter the number of bacteria in CFU/100 ml: "))
silicate = input("Presence or absence of Silicate (present/absent): ").strip().lower()  # Ensuring the input is properly formatted

if nitrate >= 95 and phosphate >= 89 and bacteria <= 200 and silicate == "present":
    print("Agricultural effluent: inspect agricultural sites nearby")

elif nitrate >= 95 and phosphate <= 89 and bacteria >= 200 and silicate == "absent":
    print("Sewage effluent: inspect illegal connections to outlets")

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "present":
    print("Dewatering effluent: inspect construction sites nearby")

elif nitrate >= 95 and phosphate >= 89 and bacteria >= 200 and silicate == "present":
    print("Mixed-source effluent: further tests are required")

elif nitrate <= 95 and phosphate <= 89 and bacteria <= 200 and silicate == "absent":
    print("No pollution detected, water is clean")

else:
    print("Unidentified source, please investigate further")
```

```
Enter Nitrate concentration in µg/L: 95
Enter phosphate concentration in µg/L: 100
Enter the number of bacteria in CFU/100 ml: 100
Presence or absence of Silicate (present/absent): present
Agricultural effluent: inspect agricultural sites nearby
```