Here are the code examples along with their expected outputs based on the questions and answers for multiset programming:

1. Create a multiset from a list with duplicates and display it.

```
python
from multiset import Multiset

ms = Multiset(['apple', 'banana', 'apple', 'orange', 'banana', 'banana'])
print("Multiset:", ms)
Output:

text
Multiset: Multiset({'banana': 3, 'apple': 2, 'orange': 1})
```

2. Perform union, intersection, difference, and addition on two multisets.

```
python
from multiset import Multiset

set1 = Multiset([1, 2, 2, 3])
set2 = Multiset([2, 2, 2, 3, 4, 4])

print("Union:", set1 | set2)
print("Intersection:", set1 & set2)
print("Difference:", set1 - set2)
print("Addition:", set1 + set2)
Output:


text
Union: Multiset({1, 2, 2, 2, 2, 3, 4, 4})
Intersection: Multiset({2, 2, 3})
Difference: Multiset({1})
Addition: Multiset({1, 2, 2, 2, 2, 2, 3, 3, 4, 4})
```

3. Find symmetric difference of multiple sets

```
python
test_list = [
  {5, 3, 2, 6, 1},
  {7, 5, 3, 8, 2},
```

```
  {9, 3},
  {0, 3, 6, 7}
]

sym_diff = set()
for s in test_list:
    sym_diff ^= s

print("Symmetric difference:", sym_diff)
```

Output:

```
text
Symmetric difference: {0, 1, 8, 9}
```

4. Print the minimum and maximum of a set

```
python
A = {5, 3, 8, 2, 9}
print("Minimum:", min(A))
print("Maximum:", max(A))
```

Output:

```
text
Minimum: 2
Maximum: 9
```

5. Find common symptoms among patients (intersection of multisets)

```
python
from multiset import Multiset

patients_symptoms = [
    Multiset(["fever", "cough", "headache"]),
    Multiset(["fever", "cough", "sore throat"]),
    Multiset(["fever", "headache", "cough"]),
]

common_symptoms = patients_symptoms[0]
for symptoms in patients_symptoms[1:]:
    common_symptoms &= symptoms
```

```
print("Common symptoms across patients:", common_symptoms)
```
Output:

```
text
Common symptoms across patients: Multiset({'fever', 'cough'})
```

6. Simple query classification using multiset

```
python
from multiset import Multiset

categories = [
    ("sports", Multiset(["football", "basketball", "tennis",
"game", "player"])),
    ("technology", Multiset(["computer", "software",
"internet", "programming", "code"])),
    ("travel", Multiset(["vacation", "flight", "hotel",
"destination", "trip"])),
]

def classify_query(query, categories):
    query_multiset = Multiset(query.lower().split())
    best_score, best_match = 0, None
    for name, keywords in categories:
        score = len(query_multiset & keywords)
        if score > best_score:
            best_score, best_match = score, name
    return best_match

query = "Going by flight for the football match"
print("Predicted category:", classify_query(query,
categories))
```
Output:

```
text
Predicted category: travel
```

7. Medical diagnosis using multiset for symptoms

```
python
from multiset import Multiset
```

```
def diagnose(symptoms, conditions):
    potential_diagnoses = []
    for condition_name, condition_symptoms in conditions:
        if symptoms.issubset(condition_symptoms):
            print(f"Condition: {condition_name}")
            print(f"Symptoms: {condition_symptoms}")
            potential_diagnoses.append(condition_name)
    return potential_diagnoses

conditions = [
    ("Allergies", Multiset(["runny nose", "sore throat",
"cough", "sneezing", "itchy eyes", "congestion"])),
    ("Influenza", Multiset(["fever", "cough", "muscle aches",
"headache", "fatigue"])),
    ("Common Cold", Multiset(["runny nose", "sore throat",
"fever", "cough", "headache"])),
]

patient_symptoms = Multiset(["runny nose", "sore throat",
"cough"])
potential_diagnoses = diagnose(patient_symptoms, conditions)
if potential_diagnoses:
    print("Potential diagnoses:")
    for diagnosis in potential_diagnoses:
        print("-", diagnosis)
else:
    print("No matching conditions found.")
```

Output:

```
text
Condition: Allergies
Symptoms: Multiset({'runny nose', 'sore throat', 'cough',
'sneezing', 'itchy eyes', 'congestion'})
Condition: Common Cold
Symptoms: Multiset({'runny nose', 'sore throat', 'fever',
'cough', 'headache'})
Potential diagnoses:
- Allergies
- Common Cold
```

If you want, I can help you run any of these examples or prepare the output in a downloadable file as well. Just let me know!

1. https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/91702782/e2610142-bf40-4e5a-93d2-1aee4397179a/Set-and-Multiset.pptx