Python-4 Homework

1. 🏏 Cricket Player Performance Summary

Input:

```
players = [
  {"name": "Kohli", "scores": [54, 76, 102, 90]},
  {"name": "Rohit", "scores": [45, 88, 60, 40]},
  {"name": "Gill", "scores": [70, 80, 77, 120]}
]
```

Task: Create a new dictionary where keys are player names and values are their average scores.

Expected Output:

```
{'Kohli': 80.5, 'Rohit': 58.25, 'Gill': 86.75}
```

2. ⚽ Longest Football Team Name (With Vowels Count)

Input:

```
teams = ["Barcelona", "Juventus", "ParisSaintGermain", "Chelsea"]
```

Task: Print the team with the longest name and the number of vowels in it.

Expected Output:

```
Team: ParisSaintGermain, Vowels: 7
```

3. 🧪 Extract Most Frequent Character (Excluding Digits)

Input:

```
data = "covid19spread2023"
```

Task: Count and return the most frequent letter (a–z only).

Expected Output:

```
Most Frequent Character: d
```

4. 🏥 Filter Critical Patients from Records

Input:

```
patients = [
  {"name": "Alice", "bp": 140, "sugar": 200},
  {"name": "Bob", "bp": 120, "sugar": 150},
  {"name": "Cara", "bp": 160, "sugar": 220}
]
```

Condition: BP > 130 and Sugar > 180 is critical.
Expected Output:

```
['Alice', 'Cara']
```

5. ⚽ Footballer Goal Sorting Using Binary Search

Input:

```
goals = [2, 5, 8, 10, 13, 18, 20]
search_goal = 10
```

Task: Use binary search to find the index of the goal scored.

Expected Output:

```
Goal found at index: 3
```

6. 🧪 Find Scientific Words with Max Unique Letters

Input:

```
words = ["photosynthesis", "respiration", "chlorophyll", "transpiration"]
```

Task: Return the word with the highest number of unique letters.

Expected Output:

'photosynthesis' with 11 unique characters

7. 🏏 Find Cricketers with Consistent Form (Avg > 60)

Input:

```
data = {
  "Dhoni": [50, 60, 55],
  "Kohli": [100, 90, 80],
  "Hardik": [30, 40, 50]
}
```

Output:

```
['Kohli']
```

8. ⚽ Create Inverted Team Dictionary

Input:

```
players = {
  "Messi": "PSG",
  "Ronaldo": "Al-Nassr",
  "Mbappe": "PSG"
}
```

Task: Reverse the dictionary to group players by team.

Expected Output:

```
{
  "PSG": ["Messi", "Mbappe"],
  "Al-Nassr": ["Ronaldo"]
}
```

9. 🏥 Find Most Common Disease

Input:

```
diagnoses = ["Diabetes", "Flu", "Covid", "Flu", "Covid", "Flu"]
```

Output:

```
Most common disease: Flu
```

10. 🧪 Find Longest Word with All Vowels

Input:

```
words = ["sequoia", "education", "automobile", "abstemious"]
```

Output:

```
Longest word with all vowels: abstemious
```

11. ⚽ Binary Search for Player Jersey Number

Input:

```
jerseys = [7, 10, 11, 14, 23, 30, 33]
search = 23
```

Task: Use binary search to check if the jersey exists.

Output:

```
Found at index: 4
```

12. 🏏 Get Top 2 Cricketers by Total Runs

Input:

```
stats = {
  "Kohli": [60, 70, 100],
  "Gill": [80, 90, 85],
  "Rohit": [30, 40, 50]
}
```

Output:

```
Top 2: ['Gill', 'Kohli']
```

13. 🧪 Replace Special Terms with Definitions

Input:

```
text = "Photosynthesis happens in chlorophyll using sunlight"
definitions = {
  "Photosynthesis": "a process in plants",
  "chlorophyll": "a green pigment"
}
```

Output:

```
"a process in plants happens in a green pigment using sunlight"
```

14. 🏥 Sort Patients by Name Length

Input:

```
names = ["Ankit", "Beatrice", "Sam", "Jonathan"]
```

Output:

```
['Sam', 'Ankit', 'Beatrice', 'Jonathan']
```

15. ⚽ Check for Anagram Players

Input:

```
player1 = "listen"
player2 = "silent"
```

Output:

```
Yes, they are anagrams.
```

16. 🧪 Remove Duplicates from String List and Sort

Input:

```
words = ["atom", "molecule", "atom", "compound", "molecule"]
```

Output:

```
['atom', 'compound', 'molecule']
```

17. 🏏 Merge Two Player Stat Dictionaries

Input:

```
a = {"Kohli": 70, "Gill": 80}
b = {"Rohit": 60, "Gill": 85}
```

Output:

```
{'Kohli': 70, 'Gill': 85, 'Rohit': 60}
```

18. 🧪 Sort by Length then Alphabetically

Input:

```
terms = ["cell", "organism", "dna", "gene"]
```

Output:

```
['dna', 'cell', 'gene', 'organism']
```

19. ⚽ Create Team Groups with Player Count

Input:

```
players = {
  "Messi": "PSG",
  "Ronaldo": "Al-Nassr",
  "Mbappe": "PSG",
  "Neymar": "PSG"
}
```

Output:

```
{'PSG': 3, 'Al-Nassr': 1}
```

20. 🏥 Count Letter Frequency in All Patient Names

Input:

```
names = ["Alice", "Bob", "Cara"]
```

Output:

```
{'A': 2, 'l': 1, 'i': 1, 'c': 2, 'e': 1, 'B': 1, 'o': 1, 'r': 1}
```

21. 🧪 Case-Sensitive Substring Count

Input:

```
text = "DNA is not dna. DNA encodes genes."
substring = "DNA"
```

Output:

```
Count: 2
```

22. ⚽ Binary Search to Find Closest Goal Number

Input:

```
goals = [3, 6, 9, 14, 18]
search = 13
```

Output:

```
Closest goal: 14
```

23. 🏏 List Cricketers Who Improved Over Matches

Input:

```
data = {
  "Kohli": [30, 60, 90],
  "Gill": [100, 80, 60]
}
```

Output:

```
Improving: ['Kohli']
```

24. 🏥 Create Index-Based Patient Lookup

Input:

```
patients = ["Alice", "Bob", "Cara"]
```

Output:

```
{0: "Alice", 1: "Bob", 2: "Cara"}
```

25. 🧪 Filter Words Starting and Ending with Same Letter

Input:

```
words = ["radar", "rotor", "hello", "world", "mom"]
```

Output:

```
['radar', 'rotor', 'mom']
```