CSE102 Offline Assignment

Loops and Conditionals

Submission Deadline: 11:59 PM, 12 May 2024

Problem Statement

You are managing an ancient energy machine with n rows of power cells. Each row contains a variable number of integers. The machine operates according to the following rules:

1. A row is considered **prime-active** if the sum of all numbers in that row is a prime number.
2. A row is considered **palindrome-active** if the sum of all numbers in that row is a palindrome (reads the same forwards and backwards).
3. A row is considered **harmonic** if the alternating sum (first - second + third - fourth + ...) is divisible by 7.
4. A row is considered **balanced** if the sum of numbers at odd positions equals the sum of numbers at even positions.

Task

Take input for n rows ($2 \leq n \leq 10$), each containing a variable number of integers. For each row, determine its activation status based on the rules above and calculate its **energy level**, which is determined as follows:

- Start with energy level = 0
- Add 5 points if row is prime-active
- Add 3 points if row is palindrome-active
- Add 4 points if row is harmonic
- Add 2 points if row is balanced

Input

- First line: an integer n
- Next n lines: each line starts with an integer k (the number of values in that row), followed by k space-separated integers

Output

For each row, print one line:

```
Row X: [Active Status] - Energy Level Y
```

where X is the row number (starting from 1), Y is the row energy level and [Active Status] is one of the following:

- `ULTRA` if the row satisfies all four conditions
- `HIGH` if the row satisfies exactly three conditions
- `MEDIUM` if the row satisfies exactly two conditions
- `LOW` if the row satisfies exactly one condition
- `INACTIVE` if the row satisfies none of the conditions

After processing all rows, print a summary line:

```
Total Energy:  Z
```

where Z is the sum of all energy levels.

Constraints

- You **must** solve the problem using loop and/or conditional statements only.
- **Do not** use arrays or functions.
- Maximum integers in any row is 15.
- All input integers will be between 0 and 1000.

Sample Inputs and Outputs

Sample Input 1	Sample Output 1
3 3 11 22 33 4 3 5 7 11 5 10 20 30 10 10	Row 1: LOW - Energy Level 3 Row 2: INACTIVE - Energy Level 0 Row 3: INACTIVE - Energy Level 0 Total Energy: 3
Sample Input 2	**Sample Output 2**
4 3 30 40 30 4 17 17 17 17 2 121 121 3 41 23 19	Row 1: INACTIVE - Energy Level 0 Row 2: MEDIUM - Energy Level 6 Row 3: HIGH - Energy Level 9 Row 4: LOW - Energy Level 5 Total Energy: 20

Explanation of Sample 2

- **Row 1:**
  - Sum = 100 (not prime, not palindrome)
  - Alternating sum = 30 - 40 + 30 = 20 (not divisible by 7, not harmonic)
  - Odd sum = 30 + 30 = 60, even sum = 40 (not balanced)
  - Status: INACTIVE, Energy: 0
- **Row 2:**
  - Sum = 68 (not prime, not palindrome)
  - Alternating sum = 17 - 17 + 17 - 17 = 0 (divisible by 7, harmonic)
  - Odd sum = 17 + 17 = 34, even sum = 17 + 17 = 34 (balanced)
  - Status: MEDIUM, Energy: 4 + 2 = 6
- **Row 3:**
  - Sum = 242 (not prime, palindrome)
  - Alternating sum = 121 - 121 = 0 (divisible by 7, harmonic)
  - Odd sum = 121, even sum = 121 (balanced)
  - Status: HIGH, Energy: 3 + 4 + 2 = 9

- **Row 4:**
  - Sum = 83 (prime, not palindrome)
  - Alternating sum = 41 - 23 + 19 = 37 (not divisible by 7, not harmonic)
  - Odd sum = 41 + 19 = 60, even sum = 23 (not balanced)
  - Status: LOW, Energy: 5

Submission Guideline

Rename your solution C file with your student ID. If your student ID is 2405XXX, your file should be named 2405XXX.c. Then submit only this file in the submission link posted on Moodle. Do not submit any other files.

Special Instructions

Do not share your code or copy from anyone else, any website or ChatGPT. You will be awarded –100% in these cases.