
7. Perfection

Program Name: Perfect.java

Input File: perfect.dat

A perfect number is one that is equal to the sum of its factors excluding itself. The number 6 is a perfect number because the factors of 6, excluding 6, are 1, 2, and 3 and $1 + 2 + 3 = 6$.

A number is considered to be deficient if the sum of its factors excluding itself is less than the number. The number 8 is deficient because its factors, excluding 8, are 1, 2, and 4 and $1 + 2 + 4 = 7$ which is less than 8.

A number is considered to be abundant if the sum of its factors excluding itself is greater than the number. The number 12 is abundant because its factors, excluding 12, are 1, 2, 3, 4, and 6 and $1 + 2 + 3 + 4 + 6 = 16$ which is more than 12.

Input

The first line of input will contain a single integer n that indicates the number of values to process. Each of the next n lines will consist of one positive integer.

Output

On a single line for each input value print whether the input value is PERFECT, DEFICIENT, or ABUNDANT.

Example Input File

```
3
6
8
12
```

Example Output to Screen

```
PERFECT
DEFICIENT
ABUNDANT
```