In number theory, a positive integer belongs to one and only one of the following categories: Deficient, Perfect or Abundant (DPA).

To decide the category of a positive integer n, first you have to calculate the sum of all its proper positive divisors. If the result is less than n then n is a deficient number, if the result is equal to n then n is a perfect number and if the result is greater than n then n is an abundant number. Remember that the proper divisors of n don't include n itself.

For example, the proper divisors of the number 8 are 1, 2 and 4 which sum 7. Since $7 < 8$ therefore 8 is a deficient number. The proper divisors of the number 6 are 1, 2 and 3 which sum 6. Since $6 = 6$ therefore 6 is a perfect number. The proper divisors of the number 18 are 1, 2, 3, 6 and 9 which sum 21. Since $21 > 18$ therefore 18 is an abundant number.

The task is to choose the category of a positive integer n as a deficient, perfect or abundant number.

Input

Input begins with an integer t ($1 \leq t \leq 1100$), the number of test cases, followed by t lines, each line containing an integer n ($2 \leq n \leq 10^{12}$).

Output

For each test case, you should print a single line containing the word '`deficient`', '`perfect`' or '`abundant`' that representing the category of the number n.

Sample Input

```
9
999900007063
934053120000
999900003719
349621272000
560431872000
999900001643
999900003863
539630239744
137438691328
```

Sample Output

```
deficient
abundant
deficient
abundant
abundant
deficient
deficient
abundant
perfect
```