# 6040 Stop Growing!

You are given five integers: $A_0$, $B_0$, $C_0$, $D_0$ and $E_0$. Each number in the sequence, $A_k$, $B_k$, $C_k$, $D_k$ and $E_k$ are calculated by the following formula:

$$\begin{array}{lclcl} A_k &=& A_{k-1} &+& B_{k-1} \\ B_k &=& B_{k-1} &+& C_{k-1} \\ C_k &=& C_{k-1} &+& D_{k-1} \\ D_k &=& D_{k-1} &+& E_{k-1} \\ E_k &=& E_{k-1} &+& A_{k-1} \end{array}$$

For example, let's start with $A_0 = 2$, $B_0 = 1$, $C_0 = 0$, $D_0 = -1$, $E_0 = 4$.

| k | A | B | C | D | E |
|---|---|---|---|---|---|
| 0 | 2 | 1 | 0 | -1 | 4 |
| 1 | 3 | 1 | -1 | 3 | 6 |
| 2 | 4 | 0 | 2 | 9 | 9 |
| 3 | 4 | 2 | 11 | 18 | 13 |
| 4 | 6 | 13 | 29 | 31 | 17 |
| ... | ... | ... | ... | ... | ... |

The table above shows the iteration up to $k = 4$. These numbers might (or might not) grow to infinite.

Your task is to determine the minimum value $r \geq 0$ where $A_r + B_r + C_r + D_r + E_r \geq M$ for some integer $M$. In the example above, if $M = 50$, then $r = 4$, because:

$$A_4 + B_4 + C_4 + D_4 + E_4 = 6 + 13 + 29 + 31 + 17 = 96.$$

You can check for $k = 0 \ldots 3$, there will be no $k$ such that the sum of $A_k \ldots E_k$ is no less than 50.

There might be some cases where it is not possible for the integers to reach $M$, output '`-1`' if such case happened.

## Input

The first line of input contains an integer $T$ ($T \leq 1,000$) denoting the number of cases. Each case contains six integers in a line $A_0$, $B_0$, $C_0$, $D_0$, $E_0$ and $M$ ($-10^8 \leq A_0, B_0, C_0, D_0, E_0, M \leq 10^8$) as stated in the problem statement.

## Output

For each case, output '`Case #`$X$`:` $Y$', where $X$ is case number starts from 1 and $Y$ is the minimum value $r$ such that the sum of $A_r \ldots E_r$ is no less than $M$. Output $Y = -1$ if there's no such $r$.

## Sample Input

```
4
2 1 0 -1 4 50
500 10 70 -100 -200 100
0 0 0 0 0 10
1 1 1 1 1 500
```

## Sample Output

```
Case #1: 4
Case #2: 0
Case #3: -1
Case #4: 7
```