# Maximise Function

Problem Code: **MAXFUN**

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You are given a sequence $A_1, A_2, \ldots, A_N$. Find the maximum value of the expression $|A_x - A_y| + |A_y - A_z| + |A_z - A_x|$ over all triples of pairwise distinct valid indices $(x, y, z)$.

## Input

- The first line of the input contains a single integer $T$ denoting the number of test cases. The description of $T$ test cases follows.
- The first line of each test case contains a single integer $N$.
- The second line contains $N$ space-separated integers $A_1, A_2, \ldots, A_N$.

## Output

For each test case, print a single line containing one integer — the maximum value of $|A_x - A_y| + |A_y - A_z| + |A_z - A_x|$.

## Constraints

- $1 \leq T \leq 5$
- $3 \leq N \leq 10^5$
- $|A_i| \leq 10^9$ for each valid $i$

## Subtasks

**Subtask #1 (30 points):** $N \leq 500$

**Subtask #2 (70 points):** original constraints

### Example Input

```
3
3
2 7 5
3
3 3 3
5
2 2 2 2 5
```

### Example Output

```
10
0
6
```

### Explanation

**Example case 1:** The value of the expression is always $10$. For example, let $x = 1$, $y = 2$ and $z = 3$, then it is $|2 - 7| + |7 - 5| + |5 - 2| = 5 + 2 + 3 = 10$.

**Example case 2:** Since all values in the sequence are the same, the value of the expression is always $0$.

**Example case 3:** One optimal solution is $x = 1$, $y = 2$ and $z = 5$, which gives $|2 - 2| + |2 - 5| + |5 - 2| = 0 + 3 + 3 = 6$.

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|---|---|
| Author: | daanish_adm (/users/daanish_adm) |
| Date Added: | 24-01-2021 |
| Time Limit: | 1 secs |
| Source Limit: | 50000 Bytes |
| Languages: | CPP14, C, JAVA, PYTH 3.6, PYTH, CS2, ADA, PYPY, PYP3, TEXT, CPP17, PAS fpc, RUBY, PHP, NODEJS, GO, TCL, HASK, PERL, SCALA, kotlin, BASH, JS, PAS gpc, BF, LISP sbcl, CLOJ, LUA, D, R, CAML, rust, ASM, FORT, FS, LISP clisp, SQL, swift, SCM guile, PERL6, CLPS, WSPC, ERL, ICK, NICE, PRLG, ICON, PIKE, COB, SCM chicken, SCM qobi, ST, NEM, SQLQ |

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## Comments

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Try your hand at one of our many practice problems and submit your solution in the language of your choice. Our **programming contest** judge accepts solutions in over 55+ programming languages. Preparing for coding contests were never this much fun! Receive points, and move up through the CodeChef ranks. Use our practice section to better prepare yourself for the multiple **programming challenges** that take place through-out the month on CodeChef.

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Here is where you can show off your **computer programming skills**. Take part in our 10 days long monthly coding contest and the shorter format Cook-off and Lunchtime **coding contests**. Put yourself up for recognition and win great prizes. Our **programming contests** have prizes worth up to INR 20,000 (for Indian Community), $700 (for Global Community) and lots more CodeChef goodies up for grabs.

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- CodeChef Wiki (/wiki)

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- College Chapters (/college-chapters)
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