

Errors in Code...

- **Problem:**
Code does not work...
- **Question:**
What should I do?

General Hints

- Find infinite loops using **test-outputs**
 - e.g. `std::cout << "Hi";`

General Hints

- Find infinite loops using **test-outputs**
 - e.g. `std::cout << "Hi";`
- **Output variables** using `std::cout`

Example

Problem: This code **does not stop...**

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: This code **does not stop...**

Find infinite loops using
test-outputs

```
    return 0;  
}
```

Example

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int main () {
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        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: This code **does not stop...**

Output

```
#include <iostream>

int main () {
    const int n = 6;
    std::cout << "Hi!";
    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: This code **does not stop...**

NO Output

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i < 13; ++i)
        prod *= n;
    std::cout << "Hi!";
    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```


Example

Problem: This code **does not stop**...

Problem here

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: This code **does not stop...**

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Note:

*Condition only
candidate*

Example

Prob

Problem: Evaluation

`1 <= i < 13`

`(1 <= i) < 13`



`true < 13`

`1 < 13`

`true`

`false < 13`

`0 < 13`

`true`

n only
date

}

Example

Prob

WRONG: `1 <= i < 13`

RIGHT: `1 <= i && i < 13`

n only
date

}

Example

This works!

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

- Now program finishes.

Example

- Now program finishes.
- **But no output.** :-)

Example

Problem: no output

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```


Example

Problem: **no output**

Output variables using
`std::cout`

```
    return 0;  
}
```

Example

Problem: **no output**

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: **no output**

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i)
        prod *= n;
    std::cout << prod << "\n";
    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Output:

-2118184960

Example

Problem: ~~no output~~

Why negative? ...

Output:
-2118184960

```
int main() {  
    const int n = 6;  
  
    // Compute n^12  
    int prod = 1;  
    for (int i = 1; 1 <= i && i < 13; ++i)  
        prod *= n;  
    std::cout << prod << "\n";  
    // Output stars  
    for (int i = 1; i < prod; ++i)  
        std::cout << "*";  
  
    std::cout << "\n";  
  
    return 0;  
}
```

Example

Problem: no output

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i)
        prod *= n;

    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Problem here

Example

Problem: **no output**

Output prod in every iteration

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i) {
        prod *= n;
        std::cout << prod << "\n";
    }
    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Example

Problem: no output

```
#include <iostream>

int main () {
    const int n = 6;

    // Compute n^12
    int prod = 1;
    for (int i = 1; 1 <= i && i < 13; ++i) {
        prod *= n;
        std::cout << prod << "\n";
    }
    // Output stars
    for (int i = 1; i < prod; ++i)
        std::cout << "*";

    std::cout << "\n";

    return 0;
}
```

Output:

```
6
36
216
1296
7776
46656
279936
1679616
10077696
60466176
362797056
-2118184960
```

Example

Problem: **no output**

Problem: **Overflow**

6^{12} exceeds `int`.

```
return 0;  
}
```

6
6
362797056
-2118184960