

Taylor Series for Sin

Description

Write a program that takes an input floating-point number and calculates the sine of that number using the Taylor Series expansion. Your program should display the output value.

- The Taylor series expansion for sine is:

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

We will first give you an integer number *op*, you should regard it as the number of terms in your Taylor Series Expansion calculation.

After that, we will give you a floating-point number *x*. You can use the above formula to calculate the sine of a number by adding up the terms of the series until the number of terms equals *op*.

Then, output the latest sum.

NOTES:

- ALL NUMBERS in the calculation as well as IO should be taken as float (single-precision) . And please use the above methods to calculate.**
- The number of terms is calculated by counting the terms in the Taylor Series Expansion.

For example, if *op* = 2.0 and *x* = 4.5, then your Taylor Series Expansion should be:

$$\sin(4.5) = 4.5 - \frac{4.5^3}{3!} = -10.6875$$

Sample inputs and outputs

Input #1

```
4.0
3.6
```

Output #1

```
-0.691996
```

Input #2

```
5.0
1
```

Output #2

```
0.84147096
```

Input #3

```
7.0
4.6
```

Output #3

-0.9874984

Input #4

2.0

4.5

Output #4

-10.6875