



# Introduction to Programming with Java

## Task: PIExpansion

Score: ★★☆☆☆

Prerequisites: ACM Task Force Commands

### Description:

This problem asks for the implementation of Nilakantha Somayaj formula in order to calculate an approximate value of PI.

You will be asked for the number of terms (we have already coded that for you) to be included in the expansion and calculate the approximate PI value while you are printing the value after each iteration.

Here is the formula:

$$\pi = 3 + \frac{4}{2 \times 3 \times 4} - \frac{4}{4 \times 5 \times 6} + \frac{4}{6 \times 7 \times 8} - \frac{4}{8 \times 9 \times 10} + \dots$$

Notice that:

- Term is alternating in sign.
- Denominator of terms always starting with the next even number (2,4,6,8,...)

```
Applet Viewer: PIExpansion.class
Enter the number of desired terms: 25
PI after 1th term is 3.0
PI after 2th term is 3.1666666666666665
PI after 3th term is 3.1333333333333333
PI after 4th term is 3.145238095238095
PI after 5th term is 3.1396825396825396
PI after 6th term is 3.1427128427128426
PI after 7th term is 3.1408813408813407
PI after 8th term is 3.142071817071817
PI after 9th term is 3.1412548236077646
PI after 10th term is 3.141839618929402
PI after 11th term is 3.1414067184965018
PI after 12th term is 3.1417360992606653
PI after 13th term is 3.141479689004255
PI after 14th term is 3.1416831892077552
PI after 15th term is 3.1415189855952756
PI after 16th term is 3.141653394197426
PI after 17th term is 3.1415419859977827
PI after 18th term is 3.1416353566793886
PI after 19th term is 3.1415563302845726
PI after 20th term is 3.1416238066678384
PI after 21th term is 3.141565734658547
PI after 22th term is 3.1416160719181865
PI after 23th term is 3.1415721544829647
PI after 24th term is 3.141610699040473
PI after 25th term is 3.14157685435031
Applet started.
```