for - loop

Approximation

Consider the infinite series

$$1 + \frac{1}{2^2} + \cdots + \frac{1}{n^2} = \sum_{k=1}^{n} \frac{1}{k^2} \approx \frac{\pi}{6}$$

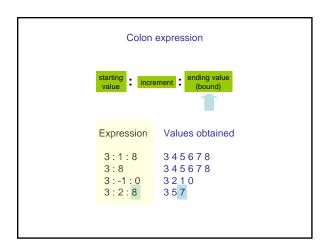How good is the approximation if n is 1000?

We need a program to calculate $\frac{1}{k^2}$ for k from 1 to 1000.

Syntax of the for-loop

for [index variable] = [starting value] : [increment] : [ending value (bound)]

[statements to repeat]

end

Colon expression

[starting value] : [increment] : [ending value (bound)]

Expression	Values obtained
3 : 1 : 8	3 4 5 6 7 8
3 : 8	3 4 5 6 7 8
3 : -1 : 0	3 2 1 0
3 : 2 : 8	3 5 7

```
% Series approximation

value= …
approx= 0;
for k = 1:n
    approx= approx + 1/k^2;
    err= value - approx;
    …
end
```

*A scalar!!!
k takes on one value
at a time*