

# PHYS 361: Loops Assignment

## Problem 1

The value of pi can be estimated by:

$$\sqrt{6 \sum_{i=1}^{\infty} \frac{1}{n^2}}$$

Write a for loop that determines that expression for n=10000. Compare your results with pi and specify format long.

```
% define format
format long;

% specify n
n = 1e+5;

% estimate the value of pi using the summation
pi_est = 0;
for i = 1:n
    pi_est = pi_est + (1 / i.^2);
end

% complete summation calculation
pi_est = sqrt(6 * pi_est);

% compare result
pi_err = pi - pi_est
```

```
pi_err =
    9.549263336960934e-06
```

```
pi_perc_err = abs( pi_err / pi ) * 100
```

```
pi_perc_err =
    3.039624925927080e-04
```