EX.2.1.6, Sauer3

Assume that your computer completes a 5000 equation back substitution in 0.005 seconds. Use the approximate operation counts n^2 for back substitution and $2n^3/3$ for elimination to estimate how long it will take to do a complete Gaussian elimination of this size. Round your answer to the nearest second.

EX.2.1.6, Sauer3, solution, Langou

Colab: https://colab.research.google.com/drive/1du0yyuN7crbXKTvAsRw1OhI9hlXje7eV

```
n = 5000.
gigaflops_per_second = ( n * n ) / 0.005 * 1e-9
print( gigaflops_per_second, 'GigaFLOP per seconds' )
```

```
5.0 GigaFLOP per seconds
```

```
time_GaussianElimination = \
 ( 2./3. * ( n * n * n ) ) / ( gigaflops_per_second * 1e9 )
print( f"{time_GaussianElimination:8.2f}", 'seconds' )
```

```
16.67 seconds
```

Or we can do it another way:

```
# Gaussian elimination take 2/3*n more time than back substitution
time_GaussianElimination = ( 2./3. * n ) * ( 0.005 )
print( f"{time_GaussianElimination:8.2f}", 'seconds' )
```

```
16.67 seconds
```

Rounding to nearest second

17 seconds