In [18]:
```
import pandas as pd
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

In [19]:
```
df = pd.read_csv(r'C:\Users\aroob\Downloads\results.csv')
```

In [20]:
```
df.head()
```

Out[20]:

	Program	Input Size	Average Time (secs)	Unnamed: 3	Unnamed: 4
0	sq_mat_ver_mult	64	0.011892	NaN	NaN
1	sq_mat_ver_mult_omp	64	0.010947	NaN	NaN
2	sq_mat_ver_mult_mpi	64	0.721880	NaN	NaN
3	sq_mat_ver_mul_mpi_tile	64	0.741924	NaN	NaN
4	sq_mat_ver_mul_openmp_tile	64	0.024986	NaN	NaN

In [21]:
```
df.drop(columns=['Unnamed: 3', 'Unnamed: 4'])
```

Out[21]:

	Program	Input Size	Average Time (secs)
0	sq_mat_ver_mult	64	0.011892
1	sq_mat_ver_mult_omp	64	0.010947
2	sq_mat_ver_mult_mpi	64	0.721880
3	sq_mat_ver_mul_mpi_tile	64	0.741924
4	sq_mat_ver_mul_openmp_tile	64	0.024986
...	...	...	...
15651	6	sq_mat_ver_mul_mpi_tile	32768.000000
15652	7	sq_mat_ver_mul_mpi_tile	32768.000000
15653	8	sq_mat_ver_mul_mpi_tile	32768.000000
15654	9	sq_mat_ver_mul_mpi_tile	32768.000000
15655	10	sq_mat_ver_mul_mpi_tile	32768.000000

15656 rows × 3 columns

In [22]:
```
grouped_df = df.groupby(['Program', 'Input Size']).mean().reset_index()
```

In [23]:
```
# Plotting
for program in grouped_df['Program'].unique():
    program_data = grouped_df[grouped_df['Program'] == program]
    plt.plot(program_data['Input Size'], program_data['Average Time (secs)']

plt.xlabel('Input Size')
plt.ylabel('Average Time (seconds)')
plt.title('Performance Comparison')
plt.legend()
plt.grid(True)
plt.xscale('log')
plt.yscale('log')
plt.show()
```