

assignment_8

November 4, 2024

1 Imports

```
[1]: from joblib import Parallel, delayed
import time
```

Requirement already satisfied: joblib in
/Users/noetrevino/.virtualenvs/neovim/lib/python3.12/site-packages (1.4.2)

[notice] A new release of pip is
available: 24.2 -> 24.3.1

[notice] To update, run:

```
pip install --upgrade pip
```

Note: you may need to restart the kernel to use updated packages.

2 Helper Functions

```
[2]: #a number is prime if it has no divisors other than 1 and itself
def is_prime(n):
    for i in range(2, n-1):
        if n % i == 0:
            return None
    n_squared = n*n
    return n_squared
```

3 Benchmarking

3.1 No joblib

```
[3]: no_joblib_list = []

start = time.time()
for i in range(2, 100000):
    no_joblib_list.append(is_prime(i))
end = time.time()

print('time took: {:.4f}sec'.format(end-start))
```

time took: 13.2226sec

```
[4]: no_joblib_list[:10]
```

```
[4]: [4, 9, None, 25, None, 49, None, None, None, 121]
```

```
[5]: list(filter(lambda x: x != None, no_joblib_list))[:10]
```

```
[5]: [4, 9, 25, 49, 121, 169, 289, 361, 529, 841]
```

3.2 With Joblib

```
[6]: start = time.time()
with_job_lib_list = Parallel(n_jobs=4)(delayed(is_prime)(i) for i in range(2,
↪100000))
end = time.time()
print('time took: {:.4f}sec'.format(end-start))
```

time took: 4.4850sec

```
[1]: %pip install mpi4py
```

Collecting mpi4py

Downloading mpi4py-4.0.1.tar.gz (466 kB)

Installing build dependencies ... done

Getting requirements to build wheel ... done

Installing backend dependencies ... done

Preparing metadata (pyproject.toml) ... done

Building wheels for collected packages: mpi4py

Building wheel for mpi4py (pyproject.toml) ... done

Created wheel for mpi4py:

filename=mpi4py-4.0.1-cp312-cp312-macosx_15_0_arm64.whl size=863933

sha256=5a3d37ba39f926bc591c5c872d7c2aeb29f8dd88cda545f13709aa0fe378cb56

Stored in directory: /Users/noetrevino/Library/Caches/pip/wheels/e1/b1/b5/165fd96ebe0ba7b0c2146683bd43dde352e753b09330d40b22

Successfully built mpi4py

Installing collected packages: mpi4py

Successfully installed mpi4py-4.0.1

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```
[ ]:
```