

```
In [7]: import pandas as pd

def normalizeCSV(fileName):
    with open(fileName , "r") as file:
        inputFilelines = file.readlines()
    with open(fileName , "w") as file:
        for line in inputFilelines:
            if line != "\n" and line != "[Name]\n" and line != "WALL\n":
                file.write(line)
    file.close()

for i in range(732):
    normalizeCSV(f"Wall/export_{i}.csv")
```

```
In [8]: wss = {"Wall Shear" : [] , "Wall Shear x" : [] , "Wall Shear y" : [] , "Wall Shear z" : []}
for i in range(732):
    df = pd.read_csv(f"Wall/export_{i}.csv")
    wss["Wall Shear"].append(df[" Wall Shear [ kPa ]"][0:2888].values)
    wss["Wall Shear x"].append(df[" Wall Shear X [ kPa ]"][0:2888].values)
    wss["Wall Shear y"].append(df[" Wall Shear Y [ kPa ]"][0:2888].values)
    wss["Wall Shear z"].append(df[" Wall Shear Z [ kPa ]"][0:2888].values)
wss
```

```
Out[8]: {'Wall Shear': [array([0., 0., 0., ..., 0., 0., 0.]),
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```

```
In [10]: tawssValues = {}
osiValues = {}
holmesValues = {}
for nodeIndex in range(2888):
    tawssValues[f"Node {nodeIndex}"] = tawssCalculation("Wall Shear" , nodeIndex)

    wss_x = tawssCalculation("Wall Shear x" , nodeIndex)
    wss_y = tawssCalculation("Wall Shear y" , nodeIndex)
    wss_z = tawssCalculation("Wall Shear z" , nodeIndex)

    osiValues[f"Node {nodeIndex}"] = (1 - ((wss_x ** 2 + wss_y ** 2 + wss_z ** 2) ** 0.5))

    holmesValues[f"Node {nodeIndex}"] = tawssValues[f"Node {nodeIndex}"] * 100
```

```
In [24]: output = pd.DataFrame({"TAWSS" : tawssValues.values() , "OSI" : osiValues.values()})
index = []
for nodeIndex in range(len(wss["Wall Shear"])[0]):
    index.append(f"Node {nodeIndex}")
output.index = index
output
```

Out[24]:

	TAWSS	OSI	HOLMES
Node 0	0.005596	0.491104	0.000050
Node 1	0.011177	0.161577	0.003782
Node 2	0.011296	0.146239	0.003996
Node 3	0.005166	0.212339	0.001486
Node 4	0.006912	0.170655	0.002276
...
Node 2883	0.000674	0.000031	0.000337
Node 2884	0.000683	0.000005	0.000341
Node 2885	0.000689	0.000002	0.000344
Node 2886	0.000659	0.000006	0.000329
Node 2887	0.000604	0.002403	0.000301

2888 rows × 3 columns

```
In [29]: outputFile = open("output.csv" , "a")
output.to_csv(outputFile)
outputFile.close()
```

In []: