

CS541 - Advanced Operating Systems Matrix Multiply Algorithm

Original sequential code algorithm:

```

for i = 0 to n - 1 do
  for j = 0 to n - 1 do
    t = 0
    for k = 0 to n - 1 do
      t = t + a[i][k] x b[k][j]
    endfor
    c[i][j] = t
  endfor
endfor

```

After parallelization. The outer loop represents the execution on separate processors:

```

for all Pi, where 0 <= i < n do
  for j = i to i + n - 1 do
    t = 0
    for k = 0 to n - 1 do
      t = t + a[k] x b[k]
    endfor
    c[j mod n] = t
    b[0...(n-1)] <- successor(b[0...(n-1)])
  endfor
endfor

```

Pictorial representation for 4 processors:

