PARALLEL PROGRAMMİNG

UPDATE CODE: CALCULATING PI WITH PARALLEL PROCESSING

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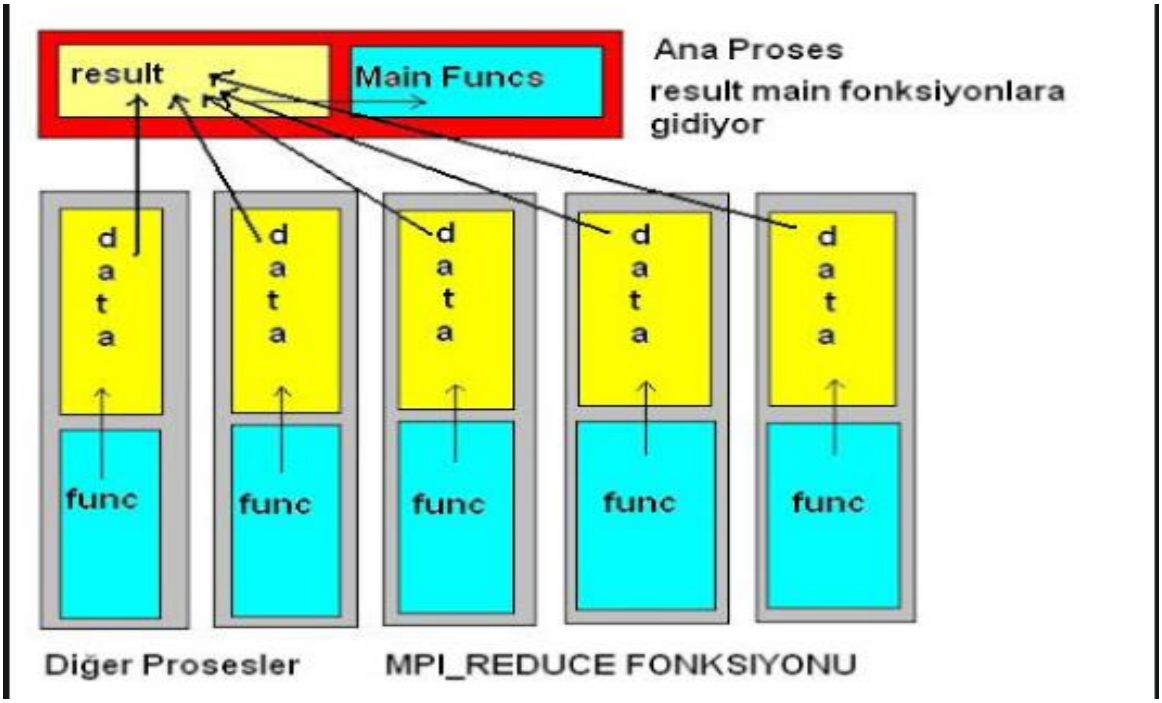
```c
#include <stdio.h>
#include <stdlib.h>
#include "mpi.h"
#include "math.h"

#define COMM MPI_COMM_WORLD
#define N 100
#define PI acos(-1)

double f(double x) { return 4 / (1 + x * x); }

double appPI = 0.0;

int main(void) {

	MPI_Init(NULL, NULL);

	int rank, size, i;
	MPI_Comm_rank(COMM, &rank);
	MPI_Comm_size(COMM, &size);

	int chunk = N / size;
	double x;
	double sum = 0.0;
	for (i = 0; i < chunk; i++) {
		x = (rank * chunk + i) / (double)N;
		sum += f(x);
	}
	sum /= N;

	printf("Rank %d: %f\n", rank, sum);

	MPI_Reduce(&sum, &appPI, 1, MPI_DOUBLE, MPI_SUM, 0, COMM);

	if (rank == 0) {
		printf("Approx PI = %f\n", appPI);
	}
	MPI_Finalize();
	return 0;

}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19042.867]
(c) 2020 Microsoft Corporation. Tüm hakları saklıdır.

C:\Users\90531\source\repos\homework1\Debug>mpiexec -n 4 homework1.exe
Rank 3: 0.570392
Rank 1: 0.877493
Rank 2: 0.722615
Rank 0: 0.981076
Approx PI = 3.151576

C:\Users\90531\source\repos\homework1\Debug>mpiexec -n 5 homework1.exe
Rank 1: 0.734425
Rank 4: 0.444827
Rank 3: 0.539798
Rank 2: 0.642186
Rank 0: 0.790339
Approx PI = 3.151576

C:\Users\90531\source\repos\homework1\Debug>
```



KAYNAKÇA:

https://mpitutorial.com/tutorials/mpi-reduce-and-allreduce/

http://www.csharpnedir.com/articles/read/?id=481