

CSE 340 Midterm 2

Olcay Taner YILDIZ

I. QUESTION (15 POINTS)

Write a parallel function

```
void exists1(int* local, int p, int id)
```

which checks if there are three numbers in overall array such that $a[i+1]a[i+1] = a[i]a[i+2]$. Processor 0 will print the result.

II. QUESTION (15 POINTS)

Write a parallel function

```
void exists2(int* local, int p, int id)
```

which checks if there are two numbers in overall array whose product is K and their indexes sum up N (The number of elements in overall array). Processor 0 will print the result.

III. QUESTION (20 POINTS)

Write the parallel function

```
void max_product(int* local, int p, int id)
```

which finds the largest product of consecutive numbers in overall array. Local a 's only includes nonnegative integers. Processor 0 will print the result.

IV. QUESTION (15 POINTS)

Write the parallel function

```
void msg1(int p, int id)
```

which sends the elements in a file 'a.txt' in the processor 0 in the following way: Processor 0 will get first element, processor 1 will get second element, ..., processor $p - 1$ will get p 'th element, then processor 0 will get $p + 1$ 'th element, etc. Assume that the number of elements in the file 'a.txt' is divisible by p . (Do not use MPI_Send and MPI_Recv)

V. QUESTION (15 POINTS)

Write the parallel function

```
void msg2(int* local, int p, int id)
```

where processor i sends the first $p+i-j$ integers residing in *local* to processor j . (Do not use MPI_Send and MPI_Recv)

VI. QUESTION (20 POINTS)

Write the parallel function

```
void msg3(int p, int id)
```

which gathers the primes in all processors into an array a residing in processor 0. Processor i will find the primes between $1000000i$ and $1000000(i + 1)$. (Do not use MPI_Send and MPI_Recv)