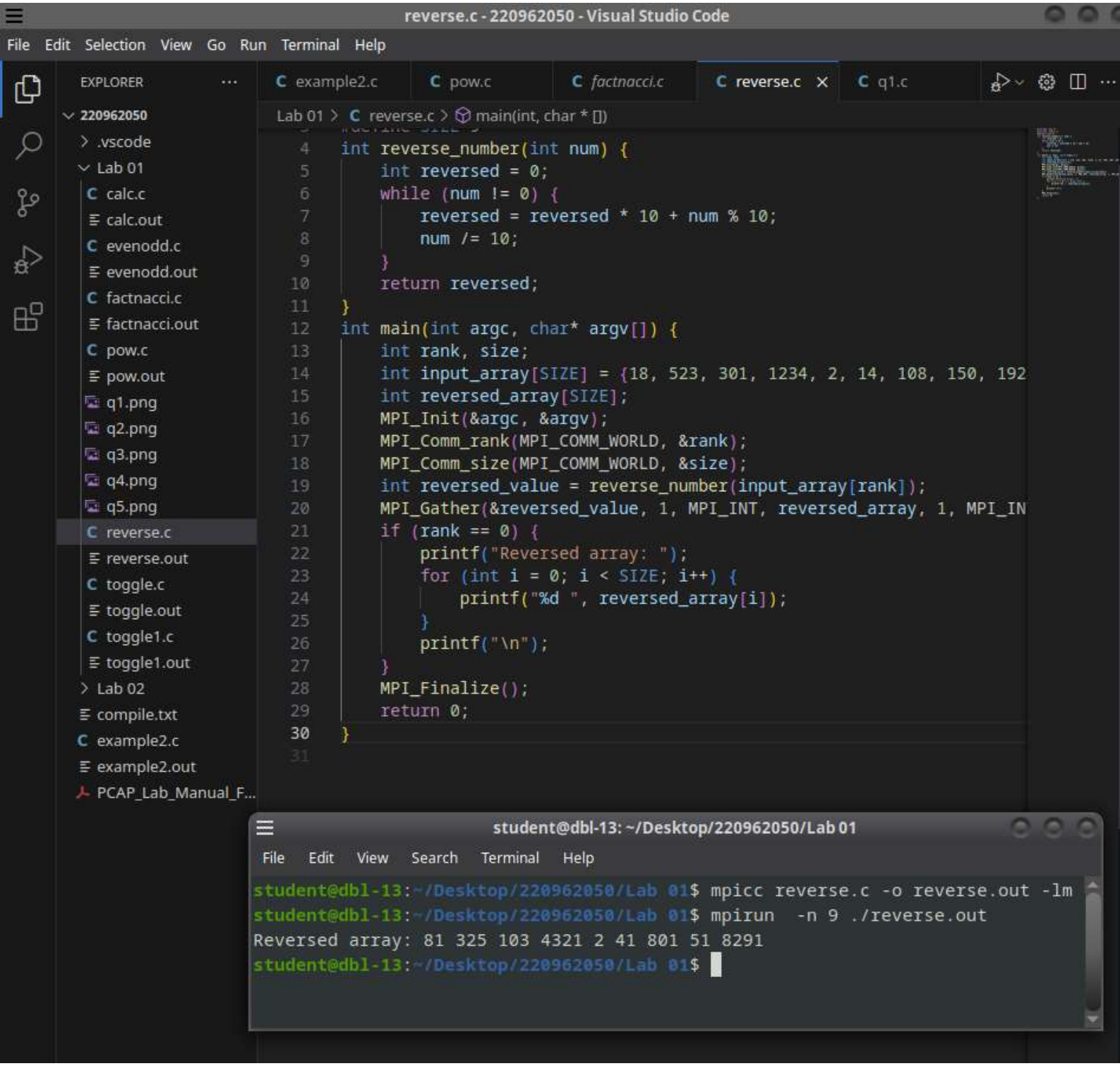
reverse.c - 220962050 - Visual Studio Code
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EXPLORER
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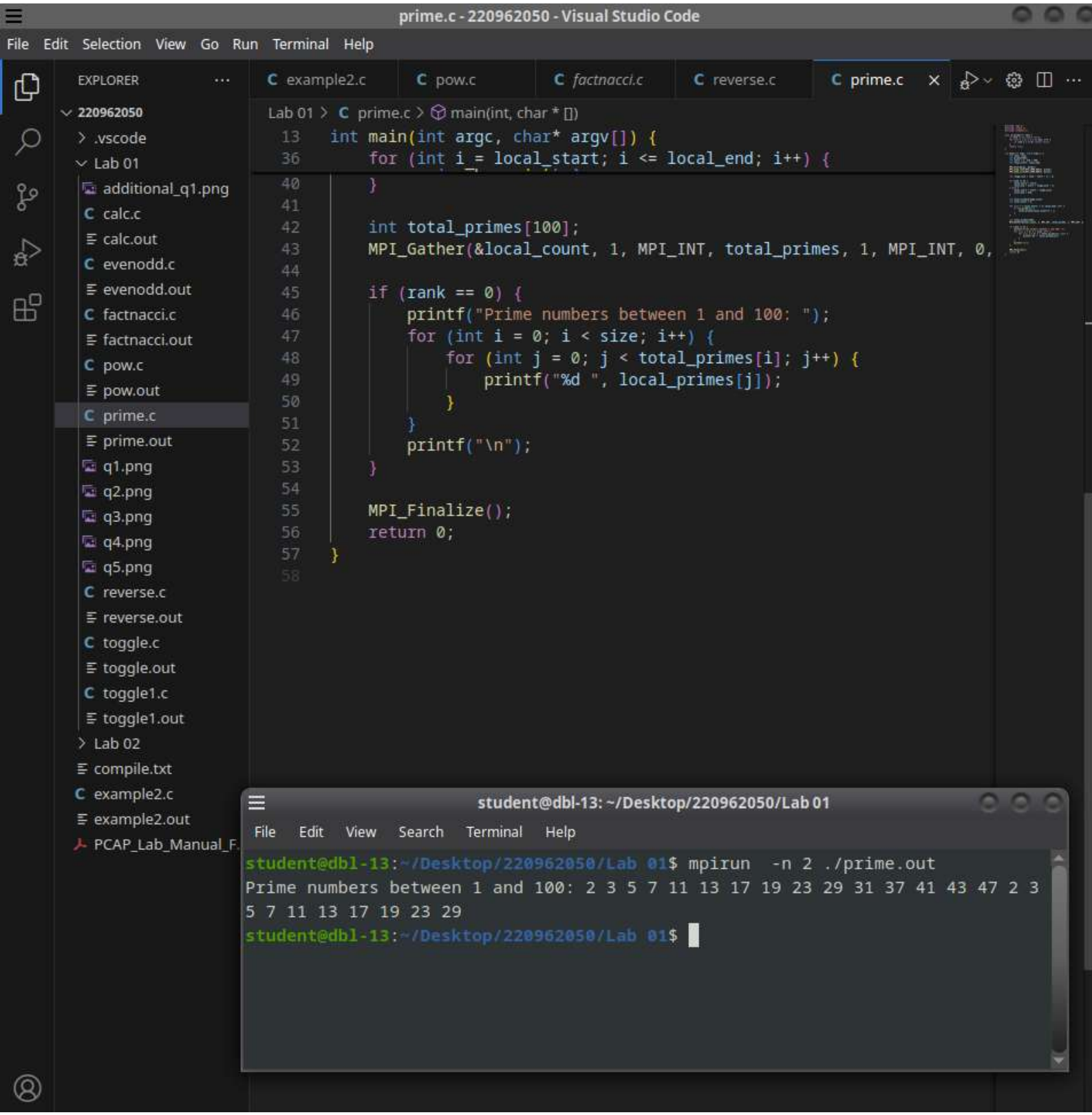
.vscode
Lab 01
calc.c
calc.out
evenodd.c
evenodd.out
factnacci.c
factnacci.out
pow.c
pow.out
q1.png
q2.png
q3.png
q4.png
q5.png
reverse.c
reverse.out
toggle.c
toggle.out
toggle1.c
toggle1.out
Lab 02
compile.txt
example2.c
example2.out
PCAP_Lab_Manual_F...
example2.c
pow.c
factnacci.c
reverse.c
q1.c
Lab 01 > reverse.c > main(int, char * [])
int reverse_number(int num) {
int reversed = 0;
while (num != 0) {
reversed = reversed * 10 + num % 10;
num /= 10;
}
return reversed;
}
int main(int argc, char* argv[]) {
int rank, size;
int input_array[SIZE] = {18, 523, 301, 1234, 2, 14, 108, 150, 192
int reversed_array[SIZE];
MPI_Init(&argc, &argv);
MPI_Comm_rank(MPI_COMM_WORLD, &rank);
MPI_Comm_size(MPI_COMM_WORLD, &size);
int reversed_value = reverse_number(input_array[rank]);
MPI_Gather(&reversed_value, 1, MPI_INT, reversed_array, 1, MPI_IN
if (rank == 0) {
printf("Reversed array: ");
for (int i = 0; i < SIZE; i++) {
printf("%d ", reversed_array[i]);
}
printf("\n");
}
MPI_Finalize();
return 0;
}
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
student@dbl-13:~/Desktop/220962050/Lab 01$ mpicc reverse.c -o reverse.out -lm
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 9 ./reverse.out
Reversed array: 81 325 103 4321 2 41 801 51 8291
student@dbl-13:~/Desktop/220962050/Lab 01$


prime.c - 220962050 - Visual Studio Code
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Lab 01
additional_q1.png
calc.c
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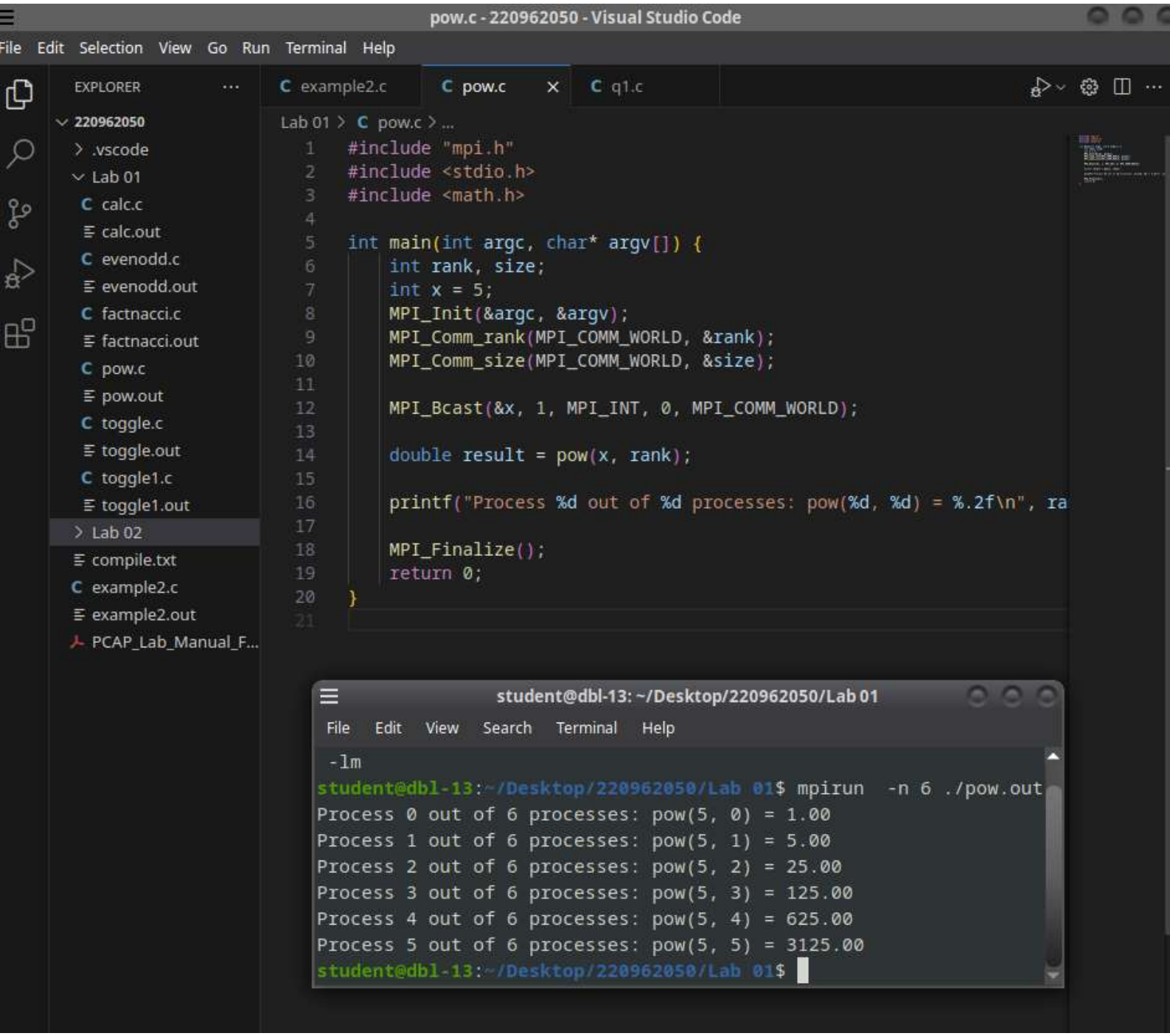
evenodd.out
factnacci.c
factnacci.out
pow.c
pow.out
prime.c
prime.out
q1.png
q2.png
q3.png
q4.png
q5.png
reverse.c
reverse.out
toggle.c
toggle.out
toggle1.c
toggle1.out
Lab 02
compile.txt
example2.c
example2.out
PCAP_Lab_Manual_F...
example2.c
pow.c
factnacci.c
reverse.c
prime.c
Lab 01 > prime.c > main(int, char * [])
13 int main(int argc, char* argv[]) {
36 for (int i = local_start; i <= local_end; i++) {
40 }
41
42 int total_primes[100];
43 MPI_Gather(&local_count, 1, MPI_INT, total_primes, 1, MPI_INT, 0,
44
45 if (rank == 0) {
46 printf("Prime numbers between 1 and 100: ");
47 for (int i = 0; i < size; i++) {
48 for (int j = 0; j < total_primes[i]; j++) {
49 printf("%d ", local_primes[j]);
50 }
51 }
52 printf("\n");
53 }
54
55 MPI_Finalize();
56 return 0;
57 }
58
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 2 ./prime.out
Prime numbers between 1 and 100: 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 2 3
5 7 11 13 17 19 23 29
student@dbl-13:~/Desktop/220962050/Lab 01$


pow.c - 220962050 - Visual Studio Code
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EXPLORER
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Lab 02
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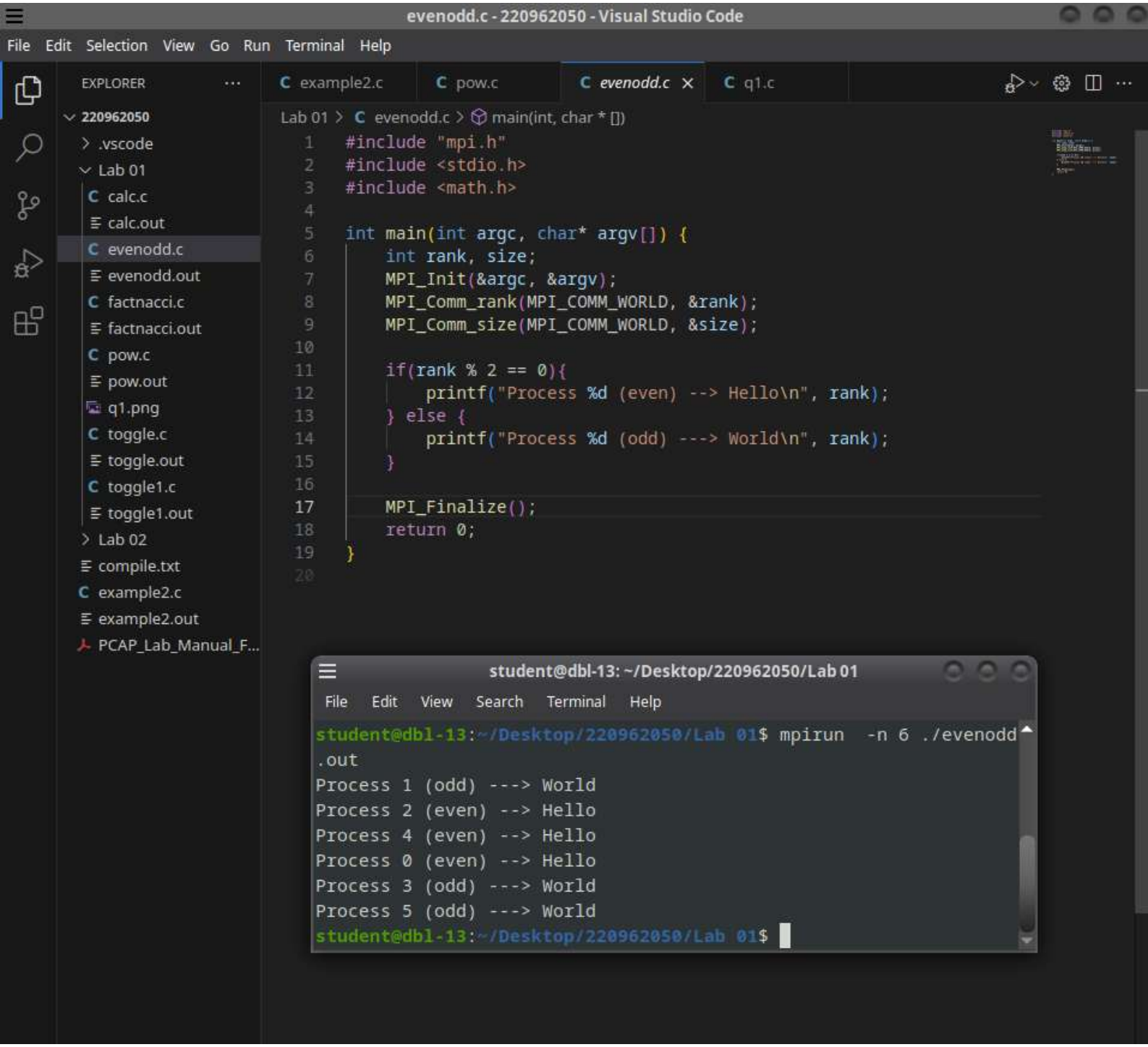
PCAP_Lab_Manual_F...
example2.c
pow.c
q1.c
Lab 01 > pow.c > ...
#include "mpi.h"
#include <stdio.h>
#include <math.h>
int main(int argc, char* argv[]) {
int rank, size;
int x = 5;
MPI_Init(&argc, &argv);
MPI_Comm_rank(MPI_COMM_WORLD, &rank);
MPI_Comm_size(MPI_COMM_WORLD, &size);
MPI_Bcast(&x, 1, MPI_INT, 0, MPI_COMM_WORLD);
double result = pow(x, rank);
printf("Process %d out of %d processes: pow(%d, %d) = %.2f\n", ra
MPI_Finalize();
return 0;
}
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
-lm
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 6 ./pow.out
Process 0 out of 6 processes: pow(5, 0) = 1.00
Process 1 out of 6 processes: pow(5, 1) = 5.00
Process 2 out of 6 processes: pow(5, 2) = 25.00
Process 3 out of 6 processes: pow(5, 3) = 125.00
Process 4 out of 6 processes: pow(5, 4) = 625.00
Process 5 out of 6 processes: pow(5, 5) = 3125.00
student@dbl-13:~/Desktop/220962050/Lab 01$


evenodd.c - 220962050 - Visual Studio Code
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Lab 02
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example2.out
PCAP_Lab_Manual_F...
example2.c
pow.c
evenodd.c
q1.c
Lab 01 > evenodd.c > main(int, char * [])
#include "mpi.h"
#include <stdio.h>
#include <math.h>
int main(int argc, char* argv[]) {
int rank, size;
MPI_Init(&argc, &argv);
MPI_Comm_rank(MPI_COMM_WORLD, &rank);
MPI_Comm_size(MPI_COMM_WORLD, &size);
if(rank % 2 == 0){
printf("Process %d (even) --> Hello\n", rank);
} else {
printf("Process %d (odd) ---> World\n", rank);
}
MPI_Finalize();
return 0;
}
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 6 ./evenodd
.out
Process 1 (odd) ---> World
Process 2 (even) --> Hello
Process 4 (even) --> Hello
Process 0 (even) --> Hello
Process 3 (odd) ---> World
Process 5 (odd) ---> World
student@dbl-13:~/Desktop/220962050/Lab 01$

calc.c - 220962050 - Visual Studio Code

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EXPLORER

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  - evenodd.out
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- Lab 02
- compile.txt
- example2.c
- example2.out
- PCAP_Lab_Manual_F...

OUTLINE

TIMELINE

example2.c | pow.c | calc.c | q1.c

Lab 01 > calc.c > main(int, char * [])

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

int main(int argc, char* argv[]) {
    int rank, size;
    int num1, num2, result;

    MPI_Init(&argc, &argv);
    MPI_Comm_rank(MPI_COMM_WORLD, &rank);
    MPI_Comm_size(MPI_COMM_WORLD, &size);

    if (size < 4) {
        if (rank == 0) {
            printf("TRequirement Atleast 4 Processes.\n");
        }
        MPI_Finalize();
        return 0;
    }

    if (rank == 0) {
        printf("Enter Number 1: ");
        scanf("%d",&num1);
        printf("Enter Number 2: ");
        scanf("%d",&num2);
    }

    MPI_Bcast(&num1, 1, MPI_INT, 0, MPI_COMM_WORLD);
    MPI_Bcast(&num2, 1, MPI_INT, 0, MPI_COMM_WORLD);

    if (rank == 0) {
        result = num1 + num2;
        printf("Process %d: Addition result ( %d + %d ) = %d\n", rank
    } else if (rank == 1) {
        result = num1 - num2;
        printf("Process %d: Subtraction result ( %d - %d ) = %d\n", r
    } else if (rank == 2) {
        result = num1 * num2;
        printf("Process %d: Multiplication result ( %d * %d ) = %d\n"
    } else if (rank == 3) {
        if (num2 != 0) {
            result = num1 / num2;
            printf("Process %d: Division result ( %d / %d ) = %d\n",
        } else {
            printf("Process %d: Division by zero error.\n", rank);
        }
    }
    MPI_Finalize();
    return 0;
```

Ln 27, Col 53 Spaces: 4 UTF-8 LF {} C Linux

PCAP_Lab_Manual_Final.pdf

student@dbl-13: ~/Desktop/220962050/Lab 01

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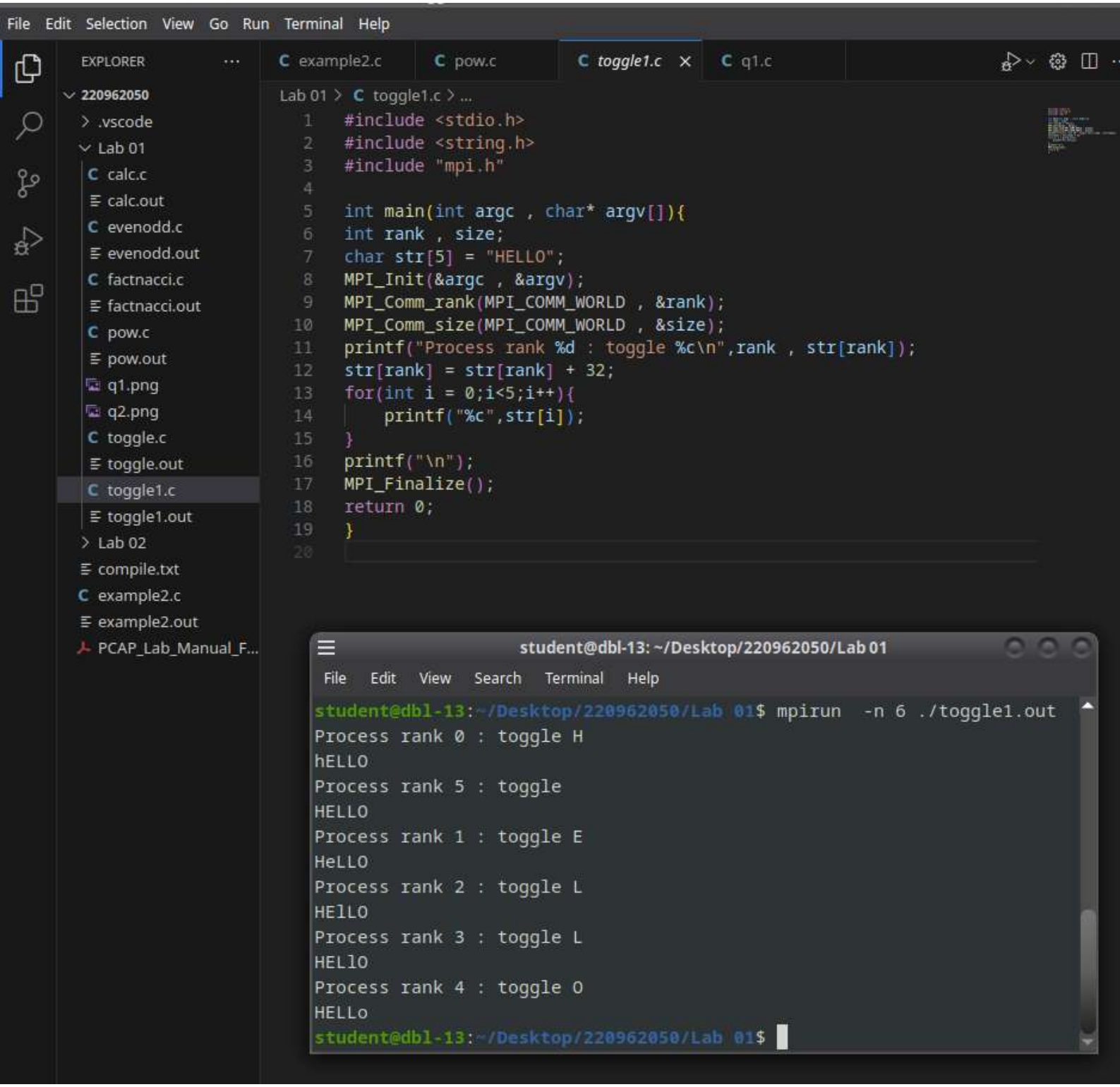
```
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 6 ./calc.out
Enter Number 1: 5
Enter Number 2: 7
Process 0: Addition result ( 5 + 7 ) = 12
Process 1: Subtraction result ( 5 - 7 ) = -2
Process 2: Multiplication result ( 5 * 7 ) = 35
Process 3: Division result ( 5 / 7 ) = 0
student@dbl-13:~/Desktop/220962050/Lab 01$
```

Output array: 81, 325, 103, 4321, 2, 41, 801, 51, 8291

2. Write a MPI program to find the prime numbers between 1 and 100 using two processes.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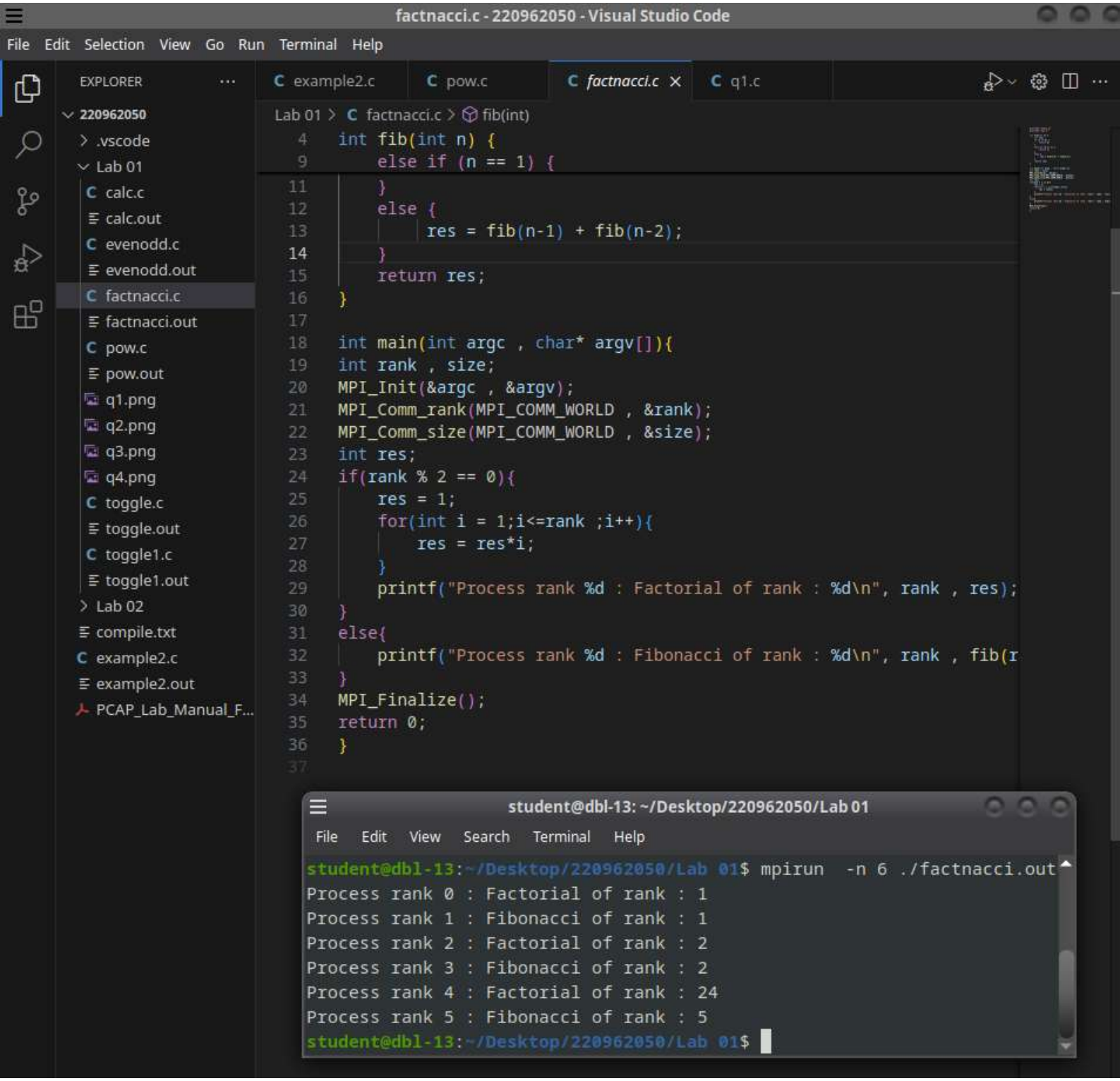
example2.out
PCAP_Lab_Manual_F...
example2.c
pow.c
toggle1.c
q1.c
Lab 01 > toggle1.c > ...
#include <stdio.h>
#include <string.h>
#include "mpi.h"
int main(int argc , char* argv[]){
int rank , size;
char str[5] = "HELLO";
MPI_Init(&argc , &argv);
MPI_Comm_rank(MPI_COMM_WORLD , &rank);
MPI_Comm_size(MPI_COMM_WORLD , &size);
printf("Process rank %d : toggle %c\n",rank , str[rank]);
str[rank] = str[rank] + 32;
for(int i = 0;i<5;i++){
printf("%c",str[i]);
}
printf("\n");
MPI_Finalize();
return 0;
}
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 6 ./toggle1.out
Process rank 0 : toggle H
hELLO
Process rank 5 : toggle
HELLO
Process rank 1 : toggle E
HeLLO
Process rank 2 : toggle L
HElLO
Process rank 3 : toggle L
HELlO
Process rank 4 : toggle O
HELLo
student@dbl-13:~/Desktop/220962050/Lab 01$


factnacci.c - 220962050 - Visual Studio Code
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example2.out
PCAP_Lab_Manual_F...
example2.c
pow.c
factnacci.c
q1.c
Lab 01 > factnacci.c > fib(int)
4 int fib(int n) {
9 else if (n == 1) {
11 }
12 else {
13 res = fib(n-1) + fib(n-2);
14 }
15 return res;
16 }
17
18 int main(int argc , char* argv[]){
19 int rank , size;
20 MPI_Init(&argc , &argv);
21 MPI_Comm_rank(MPI_COMM_WORLD , &rank);
22 MPI_Comm_size(MPI_COMM_WORLD , &size);
23 int res;
24 if(rank % 2 == 0){
25 res = 1;
26 for(int i = 1;i<=rank ;i++){
27 res = res*i;
28 }
29 printf("Process rank %d : Factorial of rank : %d\n", rank , res);
30 }
31 else{
32 printf("Process rank %d : Fibonacci of rank : %d\n", rank , fib(r
33 }
34 MPI_Finalize();
35 return 0;
36 }
37
student@dbl-13: ~/Desktop/220962050/Lab 01
File Edit View Search Terminal Help
student@dbl-13:~/Desktop/220962050/Lab 01$ mpirun -n 6 ./factnacci.out
Process rank 0 : Factorial of rank : 1
Process rank 1 : Fibonacci of rank : 1
Process rank 2 : Factorial of rank : 2
Process rank 3 : Fibonacci of rank : 2
Process rank 4 : Factorial of rank : 24
Process rank 5 : Fibonacci of rank : 5
student@dbl-13:~/Desktop/220962050/Lab 01$