

Q1

בלי דגל -g

```
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -o divideByZero divideByZero.cpp
g++ -o stackOverFlow stackOverFlow.cpp
g++ -o undefinedMemory undefinedMemory.cpp
divideByZero.cpp: In function 'int main()':
divideByZero.cpp:4:14: warning: division by zero [-Wdiv-by-zero]
   4 |     int x = 5/ 0; // Division by zero
     |             ^~
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -o stackOverFlow stackOverFlow.cpp
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -o undefinedMemory undefinedMemory.cpp
```

עם דגל -g

```
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -o stackOverFlow stackOverFlow.cpp
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -o undefinedMemory undefinedMemory.cpp
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ g++ -g -o divideByZero divideByZero.cpp
g++ -g -o stackOverFlow stackOverFlow.cpp
g++ -g -o undefinedMemory undefinedMemory.cpp
divideByZero.cpp: In function 'int main()':
divideByZero.cpp:4:14: warning: division by zero [-Wdiv-by-zero]
   4 |     int x = 5/ 0; // Division by zero
     |             ^~
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$
```

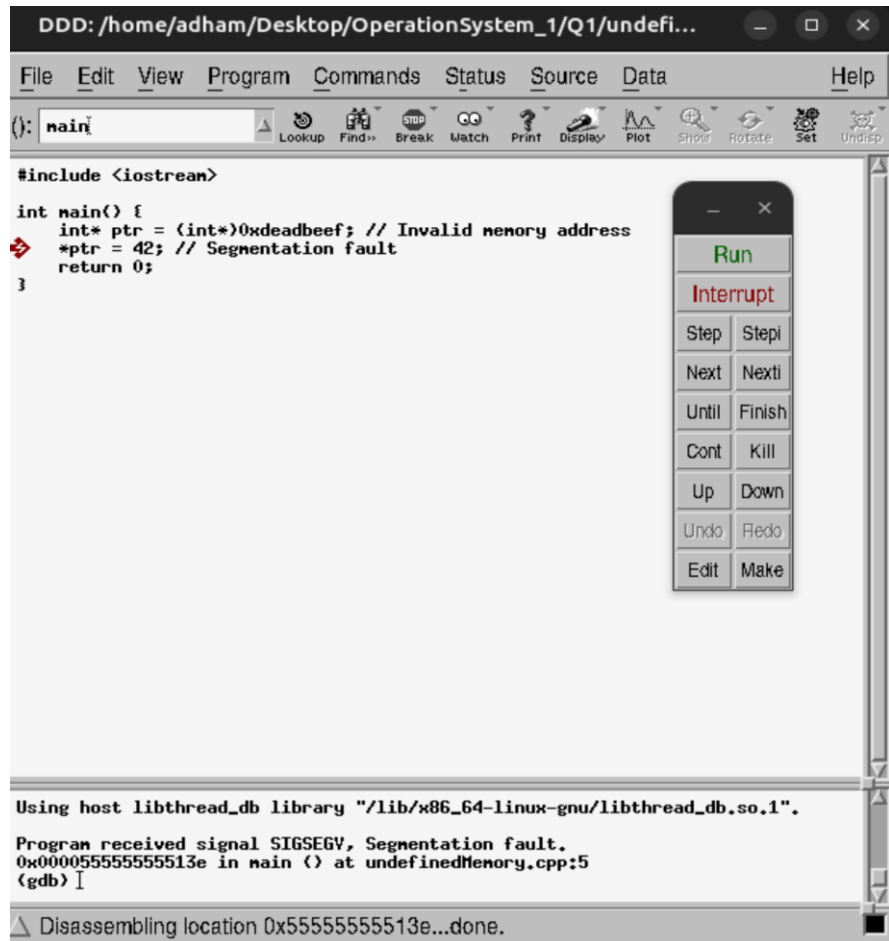
הרצנו `ulimit -c unlimited` כדי לאפשר יצירת קובצי `core`.
פתחנו את קובץ ה-`core` באמצעות הבינארי הנכון (`undefinedMemory`), וכך הצלחנו לראות את המידע המלא (למשל: משתנים כמו `ptr` קבטוך הדיבאגר)

```
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ ./undefinedMemory
Segmentation fault (core dumped)
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q1$ gdb ./undefinedMemory core
GNU gdb (Ubuntu 15.0.50.20240403-0ubuntu1) 15.0.50.20240403-git
Copyright (C) 2024 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from ./undefinedMemory...
[New LWP 17262]

This GDB supports auto-downloading debuginfo from the following URLs:
<https://debuginfod.ubuntu.com>
Enable debuginfod for this session? (y or [n]) n
Debuginfod has been disabled.
To make this setting permanent, add 'set debuginfod enabled off' to .gdbinit.
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './undefinedMemory'.
Program terminated with signal SIGSEGV, Segmentation fault.
#0  0x000055766a6a313e in main () at undefinedMemory.cpp:5
5      *ptr = 42; // Segmentation fault
(gdb) where
#0  0x000055766a6a313e in main () at undefinedMemory.cpp:5
(gdb) list
1      #include <iostream>
2
3      int main() {
4          int* ptr = (int*)0xdeadbeef; // Invalid memory address
5          *ptr = 42; // Segmentation fault
6          return 0;
7      }
(gdb) print ptr
$1 = (int *) 0xdeadbeef
(gdb)
```

פתחנו את קובץ ה־core בעזרת הדיבאגר הגרפי DDD באמצעות הפקודה `ddd ./undefinedMemory` : core



Q2

```

• adham@adham-VirtualBox:~/Desktop/OperationSystem_1$ cd Q2
• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q2$ make
gcc -g -Wall -o mandelbrot mandelbrot.c -lm
• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q2$ ./mandelbrot -1.620 -0.001
The number is NOT in the Mandelbrot set.
• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q2$ ./mandelbrot -1.627 -0.001
The number is in the Mandelbrot set.
• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q2$ ./mandelbrot -1.629 -0.001 5
The number is in the Mandelbrot set.
○ adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q2$ █

```

Q3

```

• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q3$ make run
makefile:30: warning: overriding recipe for target 'clean'
makefile:25: warning: ignoring old recipe for target 'clean'
LD_LIBRARY_PATH=. ./main
Enter real and imaginary parts: -1.621 -0.001
The number is NOT in the Mandelbrot set.
Enter real and imaginary parts: -1.627 -0.001
The number is in the Mandelbrot set.
Enter real and imaginary parts: 0 0
○ adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q3$ █

```

Q4

```

• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q4$ make exam
Running test1.txt...
Vertex          Distance from Source
0                0
1                1
2                3
Running test2.txt...
Invalid input: Negative arc weight detected.
Running test3.txt...
Vertex          Distance from Source
0                0
1                1
2                3
3                3
Running test4.txt...
Invalid number of rows and columnsmake: *** [makefile:16: exam] Error 1
• adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q4$ make gcov
gcov main.c
File 'main.c'
Lines executed:100.00% of 45
Creating 'main.c.gcov'
Lines executed:100.00% of 45

```


Q5

```

adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$ ./n 1 100
Generated array:
[58, 61, 52, -10, 68, 10, 61, 67, 24, -4, 37, 2, 65, 34, 38, 1, 15, 1, 47, 11, -14, 43, 42, 4, 57, 5, 37, -2, 42, 10, 4, -23, -3, 33, 44,
, 42, 68, 31, -14, 17, 4, 48, -4, -6, 59, 12, 73, -1, -10, 45, -12, 1, 66, 55, 31, 48, 37, 45, 71, 56, -20, 0, 59, 2, 11, -20, 21, 4, -1
2, 32, -1, 70, 57, 20, -11, 42, 9, 39, 18, 25, 62, -17, 51, 53, 63, 59, -22, 26, 29, 74, 7, 35, 51, 43, 14, -13, 1, 61, 69, 14]
Max Subarray Sum using Algorithm 3 is: 2684
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$ ./n2 1 100
Generated array:
[58, 61, 52, -10, 68, 10, 61, 67, 24, -4, 37, 2, 65, 34, 38, 1, 15, 1, 47, 11, -14, 43, 42, 4, 57, 5, 37, -2, 42, 10, 4, -23, -3, 33, 44,
, 42, 68, 31, -14, 17, 4, 48, -4, -6, 59, 12, 73, -1, -10, 45, -12, 1, 66, 55, 31, 48, 37, 45, 71, 56, -20, 0, 59, 2, 11, -20, 21, 4, -1
2, 32, -1, 70, 57, 20, -11, 42, 9, 39, 18, 25, 62, -17, 51, 53, 63, 59, -22, 26, 29, 74, 7, 35, 51, 43, 14, -13, 1, 61, 69, 14]
Max Subarray Sum using Algorithm 2 is: 2684
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$ ./n3 1 100
Generated array: 58 61 52 -10 68 10 61 67 24 -4 37 2 65 34 38 1 15 1 47 11 -14 43 42 4 57 5 37 -2 42 10 4 -23 -3 33 44 42 68 31 -14 17 4
48 -4 -6 59 12 73 -1 -10 45 -12 1 66 55 31 48 37 45 71 56 -20 0 59 2 11 -20 21 4 -12 32 -1 70 57 20 -11 42 9 39 18 25 62 -17 51 53 63 5
-22 26 29 74 7 35 51 43 14 -13 1 61 69 14
Max Subarray sum using Algorithm 1 is: 2684
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$ ./n3 1 1000
Generated array: 58 61 52 -10 68 10 61 67 24 -4 37 2 65 34 38 1 15 1 47 11 -14 43 42 4 57 5 37 -2 42 10 4 -23 -3 33 44 42 68 31 -14 17 4
48 -4 -6 59 12 73 -1 -10 45 -12 1 66 55 31 48 37 45 71 56 -20 0 59 2 11 -20 21 4 -12 32 -1 70 57 20 -11 42 9 39 18 25 62 -17 51 53 63 5
9 -22 26 29 74 7 35 51 43 14 -13 1 61 69 14 70 45 9 53 42 -24 72 -23 -8 67 27 31 -24 55 61 16 40 64 19 -6 15 4 6 -8 72 46 56 50 -16 2 42
31 72 28 61 40 -19 58 -6 -1 3 46 7 4 -22 -6 45 43 -17 -10 15 24 71 -2 -7 20 21 26 -4 30 54 63 39 3 16 25 68 -25 9 39 -1 -11 62 31 18 66
2 40 34 11 7 26 12 3 50 -18 49 -4 33 70 4 12 10 68 -7 3 18 -14 3 4 51 -21 18 38 -12 13 -19 15 -21 -7 3 63 44 -8 -8 71 -1 18 45 58 65 74
47 0 19 65 -20 14 29 61 44 57 17 39 72 -18 30 -21 23 -14 -3 3 74 18 21 43 15 -3 -14 -15 -20 -24 36 5 53 -20 -5 11 19 1 -3 40 -17 -9 57
33 -1 12 37 -1 -25 11 27 74 54 25 43 46 48 6 56 5 8 69 35 38 74 56 74 71 34 48 -12 43 65 70 1 41 59 15 65 59 51 17 11 -18 20 31 54 -7 62
-13 23 47 34 -16 11 -15 17 62 -19 -24 -12 47 -4 30 -6 74 -4 -21 14 -14 15 42 -20 3 2 25 59 33 -5 -1 -3 44 71 56 5 59 67 47 47 25 0 60 -
3 74 15 17 73 -12 73 65 -1 65 -16 56 -6 11 7 30 69 -21 54 44 48 51 25 30 35 17 54 59 68 -20 -4 42 -21 -12 36 29 1 34 19 -23 -23 -19 59 -
4 17 43 3 64 47 -17 33 73 11 -17 28 23 -22 8 8 23 65 29 42 21 43 4 -25 21 63 72 24 65 -22 8 38 72 28 67 61 0 27 71 50 63 32 4 11 35 -11
4 35 -21 3 2 25 23 31 -23 69 72 74 18 14 -23 3 -22 -25 56 22 13 34 26 10 9 14 67 -10 2 -21 4 24 39 60 4 18 10 52 -25 13 46 24 64 42 63
67 70 18 19 4 65 57 15 16 44 1 7 36 17 35 -8 -2 36 56 -16 65 0 71 42 52 9 65 1 -1 32 -11 43 -20 33 -13 61 -25 21 1 69 -9 27 53 4 21 65 2
2 45 26 55 6 68 32 2 -13 61 -11 30 -13 65 -13 54 -15 44 64 49 30 16 -5 8 62 63 13 41 45 59 31 -8 -19 35 24 12 -20 34 -8 -7 20 58 48 33 4
8 12 64 58 -18 53 32 -11 46 4 -25 34 -7 13 0 63 49 8 32 56 68 33 45 74 -8 14 44 38 -3 69 48 22 6 37 57 65 67 66 32 -10 -4 32 49 66 22 26
6 -4 12 15 29 5 73 0 56 -9 -9 -23 6 14 71 -21 13 55 -7 -4 45 37 -13 54 52 60 11 -21 51 58 -18 34 32 19 74 -14 2 25 11 35 -7 -20 38 24 1
9 -14 -20 9 66 50 30 -11 64 43 68 -7 -20 57 -3 57 -8 5 68 49 1 68 61 28 18 49 -11 -12 54 52 37 50 63 -6 -15 7 69 -8 21 10 12 66 28 18 48
3 0 66 -15 -7 -8 11 38 30 65 33 5 -21 46 36 8 60 64 48 -21 26 -20 25 43 -22 60 -19 70 14 24 -5 42 1 38 52 71 56 40 35 11 30 45 -7 -14 1
7 7 71 54 -4 45 59 47 2 9 15 58 47 73 5 38 22 25 5 48 -11 34 -3 22 -1 57 10 7 -21 29 18 73 61 15 53 34 37 37 58 16 23 -2 -1 47 -3 29 10
-4 32 40 22 46 51 44 -7 -24 -22 28 8 -18 34 3 -19 72 -5 59 -17 9 73 66 51 73 -10 27 46 64 34 -19 -15 -9 -1 -16 14 -25 53 -16 28 56 -11 1
3 64 1 42 22 -2 62 6 7 -3 56 50 25 54 65 29 25 6 -12 32 69 56 56 -22 -5 8 57 56 62 -10 71 0 -21 -3 67 26 72 7 9 56 -19 -10 32 -17 70 74
37 72 58 51 29 52 -16 62 7 57 -4 41 38 35 57 -14 60 61 60 5 65 58 -11 51 -9 -5 67 0 3 14 0 65 11 35 -7 18 12 3 57 -4 -15 30 63 0 -10 45
12 28 -17 -3 58 25 32 72 2 1 44 46 26 24 -15 3 14 73 63 -15 68 52 65 51 74 27 6 62 52 74 32 41 27 -8 16 10 43 73 59 70 51 -20 41 3 29 3
-17 68 53 72 30 47 49 20 -25 0 72 58 -13 2 57 -4
Max Subarray sum using Algorithm 1 is: 25299
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q5$

```

Q6

```

adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q6$ ./signal_sender
Enter receiver PID: 12194
Enter message (0-255): 51
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q6$ ./signal_sender
Enter receiver PID: 12194
Enter message (0-255): 200
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q6$ ./signal_sender
Enter receiver PID: 12194
Enter message (0-255): 2222
Invalid message. Must be a number between 0 and 255.
adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q6$

```

```

adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q6$ ./sign
al_receiver
My PID is 12194
Received 51
Received 200

```

```
Q7 > ☰ phonebook.txt
1  saleh sawaed,054-1234567
2  Nezer Zaidenberg,054-5531415
3  adham hamoudy,058-7654321
4  
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$./add2PB "saleh sawaed,054-1234567"
- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$./add2PB "Nezer Zaidenberg,054-5531415"
- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$./add2PB "adham hamoudy,058-7654321"
- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$./findPhone "adham"
058-7654321
- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$./findPhone "saleh"
054-1234567
- adham@adham-VirtualBox:~/Desktop/OperationSystem_1/Q7\$ █