

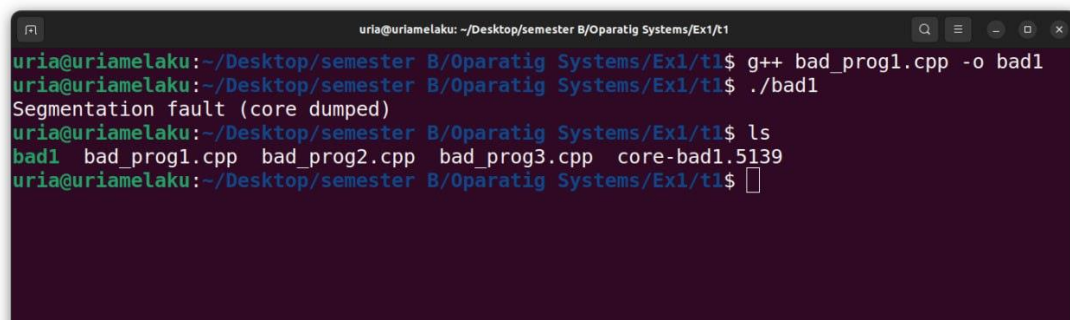
שאלה 1 - core

זוהי תוכנית מספר אחת:



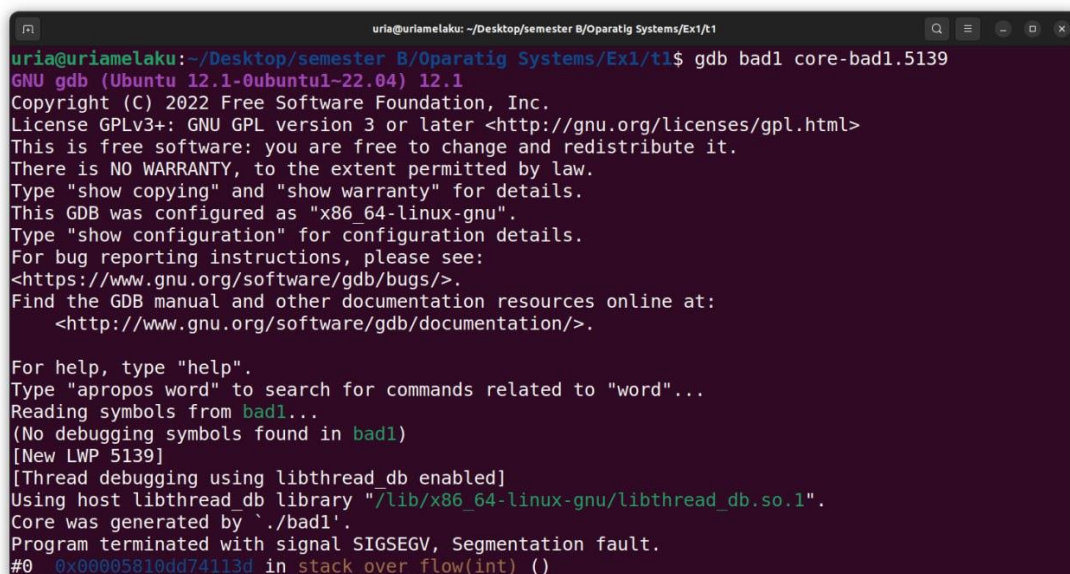
```
1
2
3 int stack_over_flow(int num){
4     return stack_over_flow(num) + 1;
5 }
6
7 int main() {
8
9     stack_over_flow(1);
10
11     return 0;
12 }
13
```

נריץ את התוכנית ללא דגל ג- ונייצר core :



```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ g++ bad_prog1.cpp -o bad1
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ./bad1
Segmentation fault (core dumped)
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ls
bad1  bad_prog1.cpp  bad_prog2.cpp  bad_prog3.cpp  core-bad1.5139
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$
```

הרצת core עם gdb:



```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ gdb bad1 core-bad1.5139
GNU gdb (Ubuntu 12.1-0ubuntu1-22.04) 12.1
Copyright (C) 2022 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 bad1...
(no debugging symbols found in bad1)
[New LWP 5139]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad1'.
Program terminated with signal SIGSEGV, Segmentation fault.
#0  0x00005810dd74113d in stack_over_flow(int) ()
```

פקודות where

```
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1
(gdb) print
The history is empty.
(gdb) where
#0  0x00005810dd74113d in stack_over_flow(int) ()
#1  0x00005810dd741142 in stack_over_flow(int) ()
#2  0x00005810dd741142 in stack_over_flow(int) ()
#3  0x00005810dd741142 in stack_over_flow(int) ()
#4  0x00005810dd741142 in stack_over_flow(int) ()
#5  0x00005810dd741142 in stack_over_flow(int) ()
#6  0x00005810dd741142 in stack_over_flow(int) ()
#7  0x00005810dd741142 in stack_over_flow(int) ()
#8  0x00005810dd741142 in stack_over_flow(int) ()
#9  0x00005810dd741142 in stack_over_flow(int) ()
#10 0x00005810dd741142 in stack_over_flow(int) ()
#11 0x00005810dd741142 in stack_over_flow(int) ()
#12 0x00005810dd741142 in stack_over_flow(int) ()
#13 0x00005810dd741142 in stack_over_flow(int) ()
#14 0x00005810dd741142 in stack_over_flow(int) ()
#15 0x00005810dd741142 in stack_over_flow(int) ()
#16 0x00005810dd741142 in stack_over_flow(int) ()
#17 0x00005810dd741142 in stack_over_flow(int) ()
#18 0x00005810dd741142 in stack_over_flow(int) ()
#19 0x00005810dd741142 in stack_over_flow(int) ()
#20 0x00005810dd741142 in stack_over_flow(int) ()
```

הרצת התוכנית פעם שנייה עם דגל -g וייצור ה core:

```
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1$ g++ -g bad_prog1.cpp -o bad1.5
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1$ ./bad1.5
Segmentation fault (core dumped)
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1$ ls
bad1  bad2.5  bad_prog1.cpp  core-bad1.5139  core-bad2.5.5551
bad1.5  bad3  bad_prog2.cpp  core-bad1.5.7409  core-bad3.5.5905
bad2  bad3.5  bad_prog3.cpp  core-bad2.5478  core-bad3.5810
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1$
```

הרצת core עם gdb:

```
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1$ gdb bad1.5 core-bad1.5.7409
GNU gdb (Ubuntu 12.1-0ubuntu1-22.04) 12.1
Copyright (C) 2022 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 bad1.5...
[New LWP 7409]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by `./bad1.5'.
Program terminated with signal SIGSEGV, Segmentation fault.
#0  0x00005810dd74113d in stack_over_flow (num=1) at bad_prog1.cpp:4
4      return stack_over_flow(num) + 1;
```

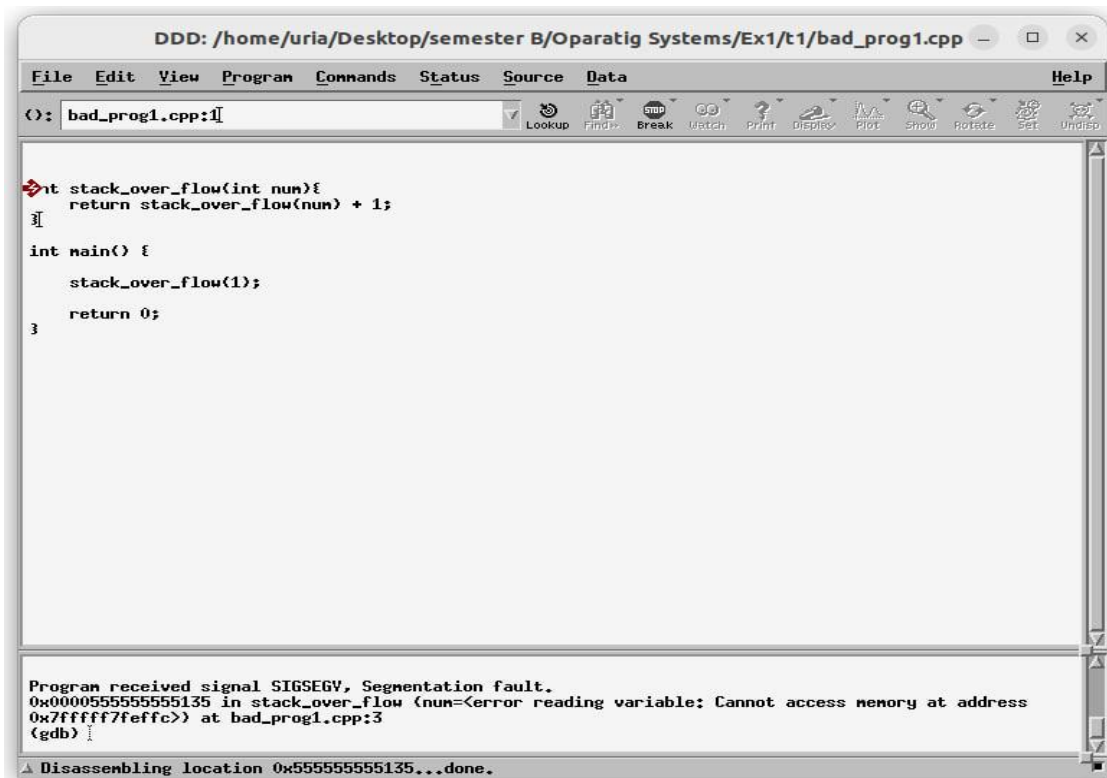
פקודת where:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1
(gdb) print
The history is empty.
(gdb) where
#0  0x00005b2b73e4b13d in stack_over_flow (num=1) at bad_prog1.cpp:4
#1  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#2  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#3  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#4  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#5  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#6  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#7  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#8  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#9  0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#10 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#11 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#12 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#13 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#14 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#15 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#16 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#17 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#18 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#19 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
#20 0x00005b2b73e4b142 in stack_over_flow (num=1) at bad_prog1.cpp:4
```

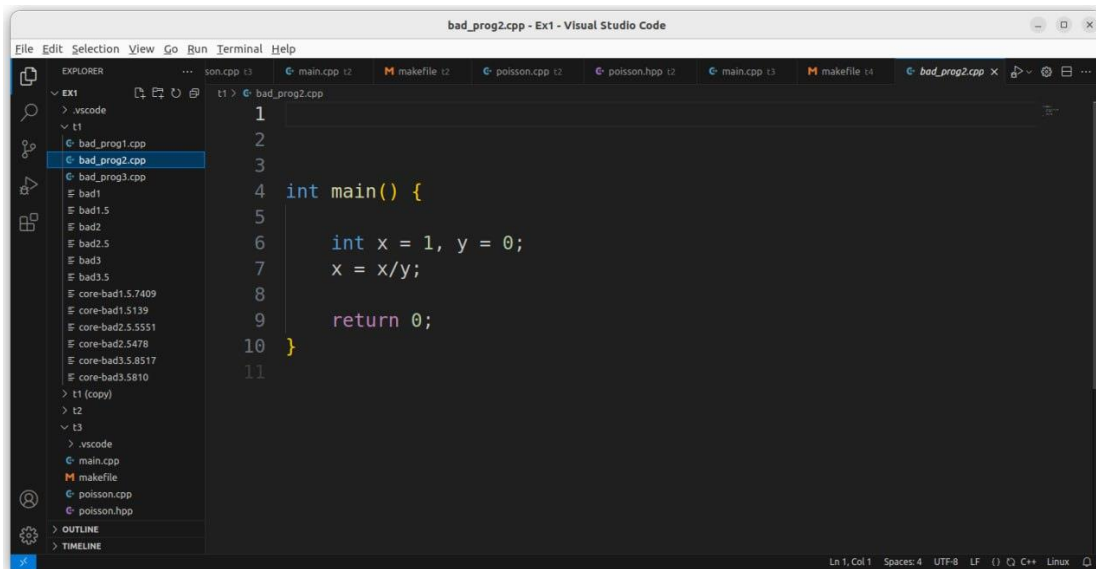
הרצה של הדיבאגר הגרפי:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ddd bad1.5 core-bad1.5.7409
```

מראה איפה הייתה הנפילה:

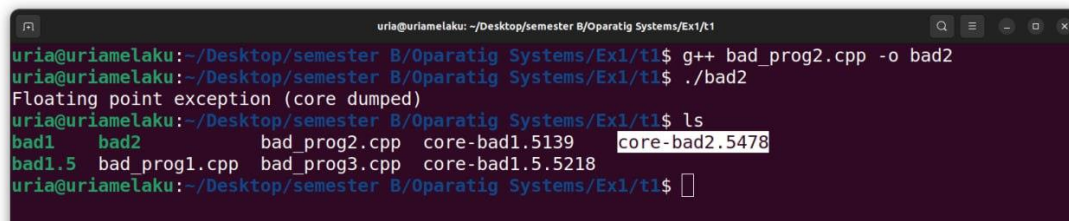


זוהי תוכנית מספר שתיים:



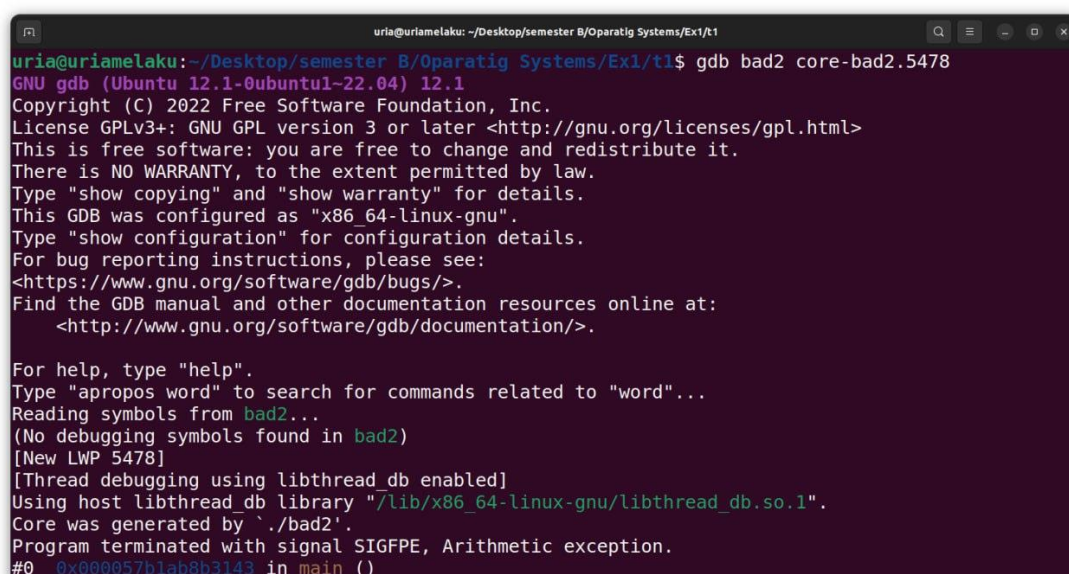
```
1
2
3
4 int main() {
5
6     int x = 1, y = 0;
7     x = x/y;
8
9     return 0;
10 }
11
```

נריץ את התוכנית ללא דגל -g ונייצר core :



```
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ g++ bad_prog2.cpp -o bad2
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ ./bad2
Floating point exception (core dumped)
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ ls
bad1  bad2  bad_prog2.cpp  core-bad1.5139  core-bad2.5478
bad1.5  bad_prog1.cpp  bad_prog3.cpp  core-bad1.5.5218
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$
```

הרצת core עם gdb:



```
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ gdb bad2 core-bad2.5478
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04) 12.1
Copyright (C) 2022 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 bad2...
(No debugging symbols found in bad2)
[New LWP 5478]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad2'.
Program terminated with signal SIGFPE, Arithmetic exception.
#0  0x000057b1ab8b3143 in main ()
```

פקודות where:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1
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 bad2...
(No debugging symbols found in bad2)
[New LWP 5478]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad2'.
Program terminated with signal SIGFPE, Arithmetic exception.
#0 0x000057b1ab8b3143 in main ()
(gdb) where
#0 0x000057b1ab8b3143 in main ()
(gdb) □
```

הרצת התוכנית פעם שנייה עם דגל g- וייצור ה core:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ g++ -g bad_prog2.cpp -o bad2.5
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ./bad2.5
Floating point exception (core dumped)
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ls
bad1    bad2    bad_prog1.cpp  bad_prog3.cpp  core-bad1.5.5218  core-bad2.5.5551
bad1.5  bad2.5  bad_prog2.cpp  core-bad1.5139  core-bad2.5478
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ □
```

הרצת הcore עם gdb:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ gdb bad2.5 core-bad2.5.5551
GNU gdb (Ubuntu 12.1-0ubuntu1-22.04) 12.1
Copyright (C) 2022 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 bad2.5...
[New LWP 5551]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad2.5'.
Program terminated with signal SIGFPE, Arithmetic exception.
#0 0x000058163549e143 in main () at bad_prog2.cpp:7
7      x = x/y;
```

פקודת print ו where :

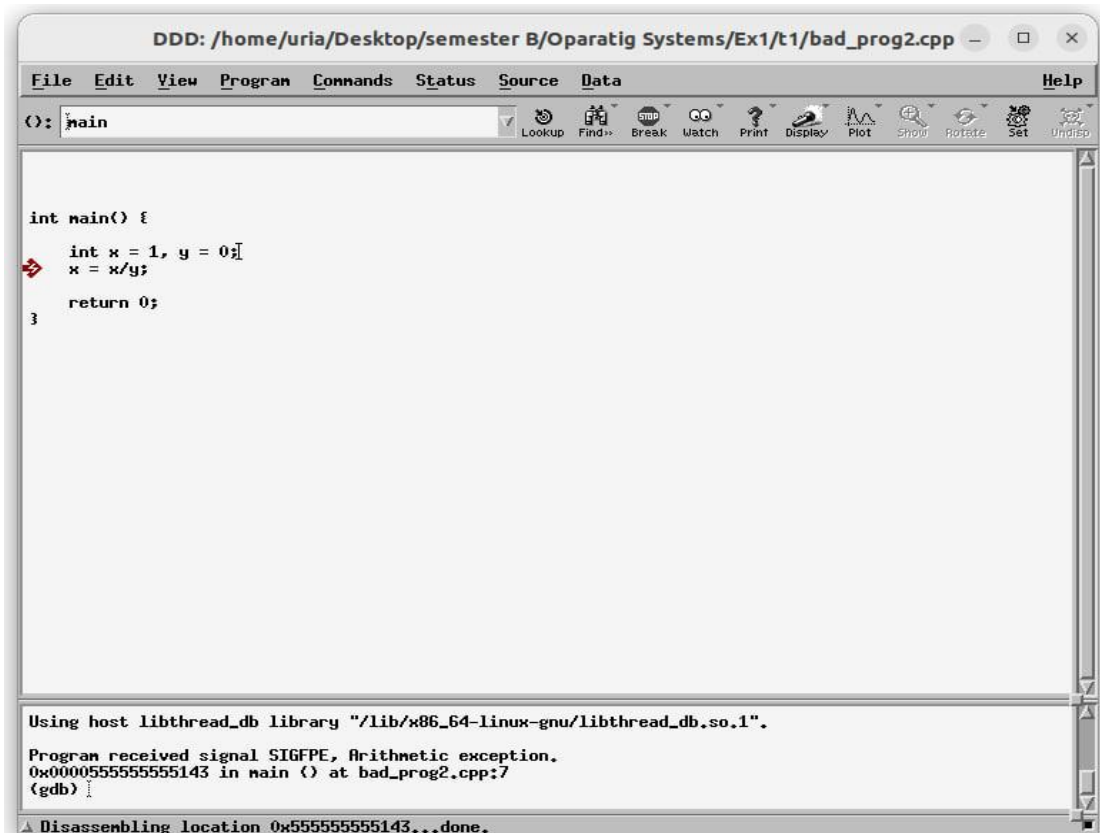
```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, 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 bad2.5...
[New LWP 5551]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad2.5'.
Program terminated with signal SIGFPE, Arithmetic exception.
#0  0x000058163549e143 in main () at bad_prog2.cpp:7
7      x = x/y;
(gdb) print
The history is empty.
(gdb) where
#0  0x000058163549e143 in main () at bad_prog2.cpp:7
(gdb)
```

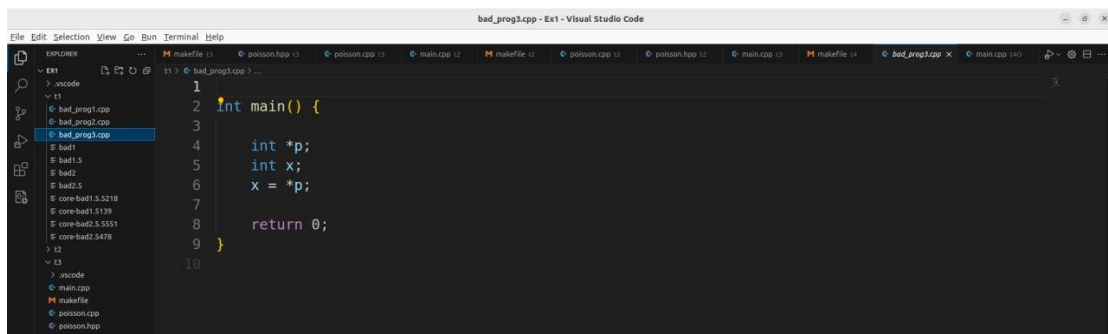
הרצה של הדיבאגר הגרפי:

```
uria@uriamelaku: ~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ddd bad2.5 core-bad2.5.5551
```

מראה איפה הייתה הנפילה:

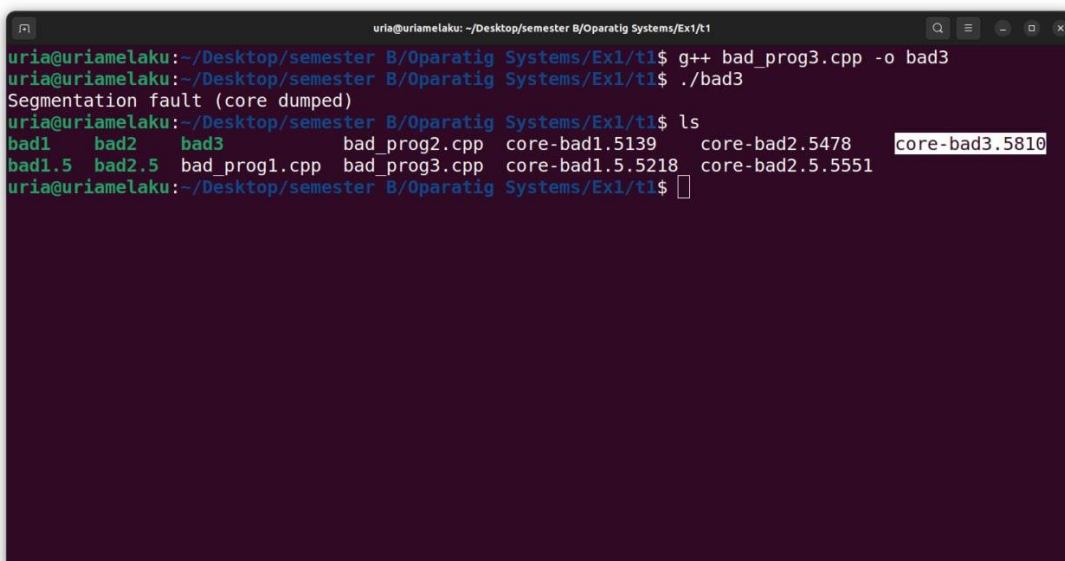


זוהי תוכנית מספר שלוש:



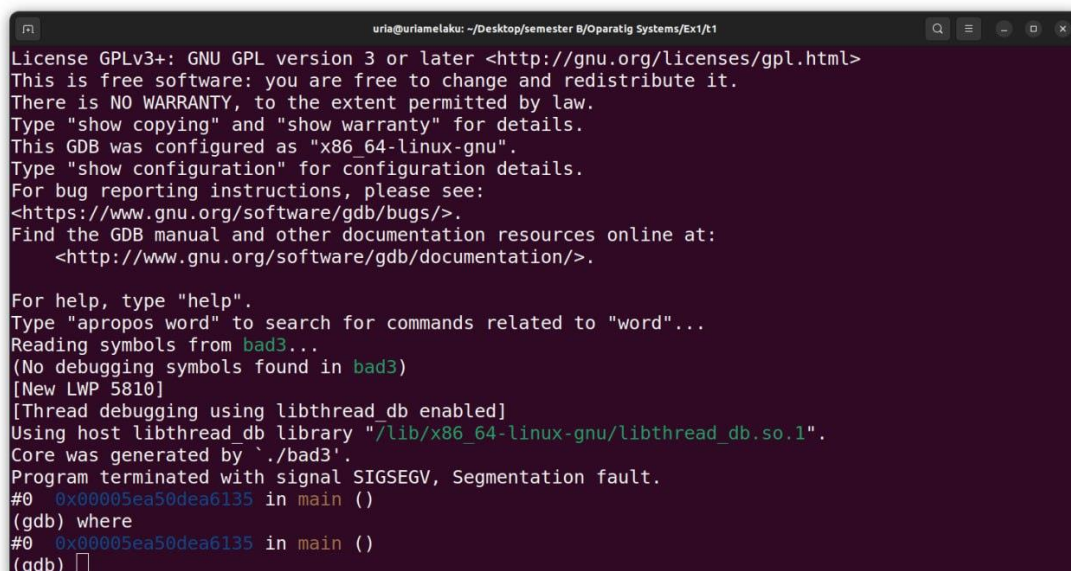
```
1
2 int main() {
3
4     int *p;
5     int x;
6     x = *p;
7
8     return 0;
9 }
10
```

נריץ את התוכנית ללא דגל g- ונייצר core :



```
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ g++ bad_prog3.cpp -o bad3
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ./bad3
Segmentation fault (core dumped)
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$ ls
bad1  bad2  bad3  bad_prog2.cpp  core-bad1.5139  core-bad2.5478  core-bad3.5810
bad1.5  bad2.5  bad_prog1.cpp  bad_prog3.cpp  core-bad1.5.5218  core-bad2.5.5551
uria@uriamelaku:~/Desktop/semester B/Oparatig Systems/Ex1/t1$
```

פקודת where:



```
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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 bad3...
(No debugging symbols found in bad3)
[New LWP 5810]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad3'.
Program terminated with signal SIGSEGV, Segmentation fault.
#0  0x00005ea50dea6135 in main ()
(gdb) where
#0  0x00005ea50dea6135 in main ()
(gdb)
```

הרצת התוכנית פעם שנייה עם דגל -g וייצור ה core:

```
uria@uriamelaku: ~/Desktop/semester B/Operatig Systems/Ex1/t1
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ g++ -g bad_prog3.cpp -o bad3.5
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ ./bad3.5
Segmentation fault (core dumped)
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ ls
bad1    bad2.5  bad_prog1.cpp  core-bad1.5139  core-bad2.5.5551
bad1.5  bad3    bad_prog2.cpp  core-bad1.5.7409  core-bad3.5810
bad2    bad3.5  bad_prog3.cpp  core-bad2.5478  core-bad3.5.8517
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$
```

הרצת core עם gdb:

```
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ gdb bad3.5 core-bad3.5.8517
```

פקודת where:

```
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$
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This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
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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 bad3.5...
[New LWP 8517]
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by './bad3.5'.
Program terminated with signal SIGSEGV, Segmentation fault.
#0  0x00005b8eea111135 in main () at bad_prog3.cpp:6
6      x = *p;
(gdb) where
#0  0x00005b8eea111135 in main () at bad_prog3.cpp:6
(gdb)
```

הרצה של הדיבאגר הגרפי:

```
uria@uriamelaku:~/Desktop/semester B/Operatig Systems/Ex1/t1$ ddd bad3.5 core-bad3.5.8517
```


מראה איפה הייתה הנפילה:

