

Debugging probíhal pomocí nástroje gdb.

Ukázka debugingu na metodě sqrt:

1. Metoda sqrt:

```
88 /**
89  * @brief      sqrt
90  *
91  * counts square root
92  * work for radicanť grather or equal to zero and natural index
93  *
94  * @param      index
95  * @param      radicanť
96  *
97  * @return     if radicanť is lower than zero or index is not natural number retuns error messege, else returns result of square root
98 */
99 double mathLib::sqrt(long long index,double radicanť)
100 {
101     if (radicanť <0)
102         throw std::runtime_error("Radicanť must be greater or equal to zero.");
103     if (index < 0)
104         throw std::runtime_error("Index must be a natural number.");
105     double x0, x = 1;
106     do {
107         x0 = x;
108         x = index - 1;
109         x *= pow(index,x0);
110         x += radicanť;
111         x /= (index * pow((index-1), x0));
112     } while (((x0 - x) > eps) || ((x - x0) > eps));
113     return x;
114 }
115 }
```

2. Soubor main.cpp, ze kterého byla tato funkce volána:

```
1 #include <stdlib.h>
2 #include "mathLib.h"
3
4 int main()
5 {
6     long long index = 2;
7     double radicanť = 49;
8     mathLib m;
9     m.sqrt(index, radicanť);
10    return 0;
11 }
```

3. Překlad proběhl s g++ a parametrem -g , spuštění s gdb:

```
lucka@lucka-ThinkPad-E490: ~/IVS_debugging
lucka@lucka-ThinkPad-E490:~/IVS_debugging$ ls
main.cpp mathLib.cpp mathLib.h
lucka@lucka-ThinkPad-E490:~/IVS_debugging$ g++ -std=c++14 -g mathLib.cpp main.cpp -o debugging
lucka@lucka-ThinkPad-E490:~/IVS_debugging$ ls
debugging main.cpp mathLib.cpp mathLib.h
lucka@lucka-ThinkPad-E490:~/IVS_debugging$ gdb ./debugging
GNU gdb (Ubuntu 9.2-0ubuntu1~20.04) 9.2
Copyright (C) 2020 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:
<http://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 ./debugging...
(gdb) break mathLib.cpp:112
Breakpoint 1 at 0x1464: file mathLib.cpp, line 112.
(gdb) run
Starting program: /home/lucka/IVS_debugging/debugging

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicanť=49) at mathLib.cpp:112
112     } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 1
x = 25
(gdb) continue
Continuing.
```

4. Brakepoint byl nastaven na řádek 112 (podmínka cyklu do-while) v souboru mathLib.cpp. Na brakepointu jsem vždy nechala vypsat lokální proměnné příkazem: info local a pokračovala příkazem: continue.

```
lucky@lucka-ThinkPad-E490: ~/IVS_debugging
Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 1
x = 25
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 25
x = 13.48
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 13.48
x = 8.557507418397627
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 8.557507418397627
x = 7.1417369123834122
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 7.1417369123834122
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 7.0014064752439378
x = 7.00000001412696582
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 7.00000001412696582
x = 7.00000000000000018
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 7.00000000000000018
x = 7
(gdb) continue
Continuing.

Breakpoint 1, mathLib::sqrt (this=0x7fffffffdee7, index=2, radicant=49) at mathLib.cpp:112
112      } while (((x0 - x) > eps) || ((x - x0) > eps));
(gdb) info locals
x0 = 7
x = 7
(gdb) continue
Continuing.
[Inferior 1 (process 1775754) exited normally]
(gdb) quit
lucky@lucka-ThinkPad-E490: ~/IVS_debugging$
```