

FH-OÖ Hagenberg/HSD
Betriebssysteme 3, WS 2025
Übung 3



Name:	Marco Söllinger	Aufwand in h:	2
Mat.Nr:	s2410306011	Punkte:	
Übungsgruppe:	Gruppe 1	korrigiert:	

Makefile (24 Punkte)

Schreiben Sie für die Dateien in *Coffeemachine.zip* auf der Kommunikationsplattform *Makefiles* die Abhängigkeiten berücksichtigen. Eine Datei soll nur dann übersetzt werden, wenn es z.B. durch Quelltextänderungen erforderlich ist. Zusätzlich ist ein Ziel *clean* einzufügen, das alle Objektdateien und die ausführbaren Dateien entfernt.

Schreiben Sie das *Makefile* in zwei Varianten:

1. Herkömmliches *Makefile* ohne Variablen und Makros.
2. Spezielles *Makefile* mit Variablen und Makros dort wo es sinnvoll ist.

Weiters soll ein Ziel hinzugefügt werden, das eine debugbare Ausführungsdatei erstellt.

Testen Sie die beiden Makefiles ausführlich und geben Sie eine Testausgabe mit ab!

Testen Sie die debugbare Datei mit dem gdb (list, run, break, continue, step, next, print, display, disassemble, backtrace) und geben Sie ebenfalls eine Testausgabe mit ab!

Geben Sie Ihre Ergebnisse, alle Dateien und die Makefiles elektronisch ab!

Allgemeine Hinweise: Legen Sie bei der Erstellung Ihrer Übung großen Wert auf eine **saubere Strukturierung** und auf eine **sorgfältige Ausarbeitung**! Dokumentieren Sie alle Schnittstellen und versehen Sie Ihre Algorithmen an entscheidenden Stellen ausführlich mit Kommentaren! Testen Sie ihre Implementierungen ausführlich! Geben Sie den **Testoutput** mit ab!

Beispiel 1

1.1 Makefile simple

1.1.1 Makefile_1

Makefile_1

```

1  output: coffeemachine_api.o coffemachine_functionality.o coffemachine_main.o
2      gcc -o output *.o -Wall -Wextra
3
4  coffeemachine_api.o: coffeemachine_api.c coffeemachine_api.h
5      gcc -c coffeemachine_api.c -Wall -Wextra
6
7  coffemachine_functionality.o: coffeemachine_functionality.c coffeemachine_functionality.h
8      gcc -c coffeemachine_functionality.c -Wall -Wextra
9
10 coffeemachine_main.o: coffeemachine_main.c
11     gcc -c coffeemachine_main.c -Wall -Wextra
12
13 clean:
14     rm *.o output output_dbg
15
16 output_dbg: coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o coffeemachine_main.dbg.o
17     gcc -o output_dbg coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o
18         coffeemachine_main.dbg.o -Wall -Wextra
19
20 coffeemachine_api.dbg.o: coffeemachine_api.c coffeemachine_api.h
21     gcc -c coffeemachine_api.c -g -O0 -Wall -Wextra -o coffeemachine_api.dbg.o
22
23 coffeemachine_functionality.dbg.o: coffeemachine_functionality.c coffeemachine_functionality.h
24     gcc -c coffeemachine_functionality.c -g -O0 -Wall -Wextra -o coffeemachine_functionality.
25         dbg.o
26
27 coffeemachine_main.dbg.o: coffeemachine_main.c
28     gcc -c coffeemachine_main.c -g -O0 -Wall -Wextra -o coffeemachine_main.dbg.o
29
30 run-debug: output_dbg
31     gdb ./output_dbg
32
33 run: output
34     ./output

```

1.1.2 Run build

Terminal Output

```

1  flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1
2  gcc -c coffeemachine_api.c -Wall -Wextra
3  coffeemachine_api.c: In function grindCoffee :
4  coffeemachine_api.c:38:16: warning: comparison of unsigned expression in      >= 0      is always
5      true [-Wtype-limits]
6      38 |     if (_coffee_ >= 0) // see assumption in the SRD
7          |             ^~
8  coffeemachine_api.c: In function insertSugar :
9  coffeemachine_api.c:52:15: warning: comparison of unsigned expression in      >= 0      is always
10     true [-Wtype-limits]
11     52 |     if (_sugar_ >= 0) // see assumption in the SRD
12         |             ^~
13  coffeemachine_api.c: In function insertMilk :
14  coffeemachine_api.c:66:14: warning: comparison of unsigned expression in      >= 0      is always
15     true [-Wtype-limits]
16     66 |     if (_milk_ >= 0) // see assumption in the SRD
17         |             ^~
18  coffeemachine_api.c: In function brewCoffee :
19  coffeemachine_api.c:80:15: warning: comparison of unsigned expression in      >= 0      is always
20     true [-Wtype-limits]
21     80 |     if (_water_ >= 0) // see assumption in the SRD
22         |             ^~
23  gcc -c coffeemachine_functionality.c -Wall -Wextra
24  coffeemachine_functionality.c: In function changePrices :
25  coffeemachine_functionality.c:155:28: warning: unused parameter      keymask      [-Wunused-
26      parameter]
27      155 | void changePrices(unsigned keymask)

```

```

23 | ~~~~~
24 gcc -c coffeemachine_main.c -Wall -Wextra
25 gcc -o output *.o -Wall -Wextra

```

1.1.3 Run build again

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1
2 gcc -c coffeemachine_functionality.c -Wall -Wextra
3 coffeemachine_functionality.c: In function changePrices :
4 coffeemachine_functionality.c:155:28: warning: unused parameter keymask [-Wunused-
   parameter]
5 155 | void changePrices(unsigned keymask)
6     | ~~~~~
7 gcc -o output *.o -Wall -Wextra

```

1.1.4 Run clean

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1 clean
2 rm *.o output output_dbg

```

1.1.5 Run Run without build before

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1 run
2 gcc -c coffeemachine_api.c -Wall -Wextra
3 coffeemachine_api.c: In function grindCoffee :
4 coffeemachine_api.c:38:16: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
5 38 | if (_coffee_ >= 0) // see assumption in the SRD
6     | ~~~
7 coffeemachine_api.c: In function insertSugar :
8 coffeemachine_api.c:52:15: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
9 52 | if (_sugar_ >= 0) // see assumption in the SRD
10    | ~~~
11 coffeemachine_api.c: In function insertMilk :
12 coffeemachine_api.c:66:14: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
13 66 | if (_milk_ >= 0) // see assumption in the SRD
14    | ~~~
15 coffeemachine_api.c: In function brewCoffee :
16 coffeemachine_api.c:80:15: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
17 80 | if (_water_ >= 0) // see assumption in the SRD
18    | ~~~
19 gcc -c coffeemachine_functionality.c -Wall -Wextra
20 coffeemachine_functionality.c: In function changePrices :
21 coffeemachine_functionality.c:155:28: warning: unused parameter keymask [-Wunused-
   parameter]
22 155 | void changePrices(unsigned keymask)
23     | ~~~~~
24 gcc -c coffeemachine_main.c -Wall -Wextra
25 gcc -o output *.o -Wall -Wextra
26 ./output
27 Coffee Machine> ^Cmake: *** [Makefile_1:32: run] Interrupt

```

1.1.6 Run debug build

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main) [SIGINT]> make -f Makefile_1 output_dbg
2 gcc -c coffeemachine_api.c -g -O0 -Wall -Wextra -o coffeemachine_api.dbg.o
3 coffeemachine_api.c: In function grindCoffee :

```

```

4 coffeemachine_api.c:38:16: warning: comparison of unsigned expression in      >= 0      is always
   true [-Wtype-limits]
5   38 |     if (_coffee_ >= 0) // see assumption in the SRD
6       |         ~~~
7 coffeemachine_api.c: In function      insertSugar      :
8 coffeemachine_api.c:52:15: warning: comparison of unsigned expression in      >= 0      is always
   true [-Wtype-limits]
9   52 |     if (_sugar_ >= 0) // see assumption in the SRD
10      |         ~~~
11 coffeemachine_api.c: In function      insertMilk      :
12 coffeemachine_api.c:66:14: warning: comparison of unsigned expression in      >= 0      is always
   true [-Wtype-limits]
13   66 |     if (_milk_ >= 0) // see assumption in the SRD
14      |         ~~~
15 coffeemachine_api.c: In function      brewCoffee      :
16 coffeemachine_api.c:80:15: warning: comparison of unsigned expression in      >= 0      is always
   true [-Wtype-limits]
17   80 |     if (_water_ >= 0) // see assumption in the SRD
18      |         ~~~
19 gcc -c coffeemachine_functionality.c -g -O0 -Wall -Wextra -o coffeemachine_functionality.dbg.o
20 coffeemachine_functionality.c: In function      changePrices      :
21 coffeemachine_functionality.c:155:28: warning: unused parameter      keymask      [-Wunused-
   parameter]
22   155 | void changePrices(unsigned keymask)
23      |                   ~~~~~
24 gcc -c coffeemachine_main.c -g -O0 -Wall -Wextra -o coffeemachine_main.dbg.o
25 gcc -o output_dbg coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o coffeemachine_main
   .dbg.o -Wall -Wextra
26 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> gdb ./output_dbg
27 GNU gdb (Fedora Linux) 16.3-1.fc42
28 Copyright (C) 2024 Free Software Foundation, Inc.
29 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
30 This is free software: you are free to change and redistribute it.
31 There is NO WARRANTY, to the extent permitted by law.
32 Type "show copying" and "show warranty" for details.
33 This GDB was configured as "x86_64-redhat-linux-gnu".
34 Type "show configuration" for configuration details.
35 For bug reporting instructions, please see:
36 <https://www.gnu.org/software/gdb/bugs/>.
37 Find the GDB manual and other documentation resources online at:
38 <http://www.gnu.org/software/gdb/documentation/>.
39
40 For help, type "help".
41 Type "apropos word" to search for commands related to "word"...
42 Reading symbols from ./output_dbg...
43 (gdb) exit

```

1.1.7 Run debug-run

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1 run-debug
2 gdb ./output_dbg
3 GNU gdb (Fedora Linux) 16.3-1.fc42
4 Copyright (C) 2024 Free Software Foundation, Inc.
5 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
6 This is free software: you are free to change and redistribute it.
7 There is NO WARRANTY, to the extent permitted by law.
8 Type "show copying" and "show warranty" for details.
9 This GDB was configured as "x86_64-redhat-linux-gnu".
10 Type "show configuration" for configuration details.
11 For bug reporting instructions, please see:
12 <https://www.gnu.org/software/gdb/bugs/>.
13 Find the GDB manual and other documentation resources online at:
14 <http://www.gnu.org/software/gdb/documentation/>.
15
16 For help, type "help".
17 Type "apropos word" to search for commands related to "word"...
18 Reading symbols from ./output_dbg...
19 (gdb) exit

```

1.1.8 Test with gdb

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_1 run-debug
2 gcc -c coffeemachine_api.c -g -O0 -Wall -Wextra -o coffeemachine_api.dbg.o
3 coffeemachine_api.c: In function grindCoffee :
4 coffeemachine_api.c:33:16: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
5     33 |     if (_coffee_ >= 0) // see assumption in the SRD
6         |
7 coffeemachine_api.c: In function insertSugar :
8 coffeemachine_api.c:46:15: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
9     46 |     if (_sugar_ >= 0) // see assumption in the SRD
10        |
11 coffeemachine_api.c: In function insertMilk :
12 coffeemachine_api.c:60:14: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
13     60 |     if (_milk_ >= 0) // see assumption in the SRD
14        |
15 coffeemachine_api.c: In function brewCoffee :
16 coffeemachine_api.c:74:15: warning: comparison of unsigned expression in >= 0 is always
   true [-Wtype-limits]
17     74 |     if (_water_ >= 0) // see assumption in the SRD
18        |
19 gcc -c coffeemachine_functionality.c -g -O0 -Wall -Wextra -o coffeemachine_functionality.dbg.o
20 coffeemachine_functionality.c: In function changePrices :
21 coffeemachine_functionality.c:155:28: warning: unused parameter keymask [-Wunused-
   parameter]
22     155 | void changePrices(unsigned keymask)
23         |
24 gcc -c coffeemachine_main.c -g -O0 -Wall -Wextra -o coffeemachine_main.dbg.o
25 gcc -o output_dbg coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o coffeemachine_main
   .dbg.o -Wall -Wextra
26 gdb ./output_dbg
27 GNU gdb (Fedora Linux) 16.3-1.fc42
28 Copyright (C) 2024 Free Software Foundation, Inc.
29 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
30 This is free software: you are free to change and redistribute it.
31 There is NO WARRANTY, to the extent permitted by law.
32 Type "show copying" and "show warranty" for details.
33 This GDB was configured as "x86_64-redhat-linux-gnu".
34 Type "show configuration" for configuration details.
35 For bug reporting instructions, please see:
36 <https://www.gnu.org/software/gdb/bugs/>.
37 Find the GDB manual and other documentation resources online at:
38 <http://www.gnu.org/software/gdb/documentation/>.
39
40 For help, type "help".
41 Type "apropos word" to search for commands related to "word"...
42 Reading symbols from ./output_dbg...
43 (gdb) list activateCoffeeMachine
44 15
45 16 //-----
46 17 // The main function that activates the machine. Here the endless loop
47 18 // for the keyboard input dispatcher of the simulator is located.
48 19
49 20 void activateCoffeeMachine() {
50 21     unsigned char kbd_input = '\0';
51 22
52 23     for (;;) {
53 24         printf("Coffee Machine> ");
54 (gdb) b 24
55 Breakpoint 1 at 0x4004b2: file coffeemachine_api.c, line 24.
56 (gdb) run
57 Starting program: /home/flashfish/Documents/Repo/FH/BSY3/Uebung03/coffeemachine/output_dbg
58
59 This GDB supports auto-downloading debuginfo from the following URLs:
60 <https://debuginfod.fedoraproject.org/>
61 Enable debuginfod for this session? (y or [n]) y
62 Debuginfod has been enabled.
63 To make this setting permanent, add 'set debuginfod enabled on' to .gdbinit.
64 [Thread debugging using libthread_db enabled]
65 Using host libthread_db library "/lib64/libthread_db.so.1".
66
67 Breakpoint 1, activateCoffeeMachine () at coffeemachine_api.c:24
68 24     printf("Coffee Machine> ");
69 (gdb) next

```

```

70 25         kbd_input = getchar();
71 (gdb) next
72 Coffee Machine> h
73 26         getchar(); // eat the newline character and ignore it
74 (gdb) next
75 27         dispatch(kbd_input);
76 (gdb) print kbd_input
77 $1 = 104 'h'
78 (gdb)

```

1.2 Makefile advanced

1.2.1 Makefile_2

Makefile_2

```

1  CC := clang
2  CFLAGS := -Wall -Wextra
3
4  SRCS := $(wildcard *.c)
5
6  OBJS_REL := $(SRCS:.c=.o)
7  OBJS_DBG := $(SRCS:.c=.dbg.o)
8
9  output: $(OBJS_REL)
10         $(CC) -o $@ $^ $(CFLAGS)
11
12  output_dbg: $(OBJS_DBG)
13         $(CC) -o $@ $^ $(CFLAGS)
14
15  %.o: %.c
16         $(CC) $(CFLAGS) -g -O0 -c $< -o $@
17
18  %.dbg.o: %.c
19         $(CC) $(CFLAGS) -g -O0 -c $< -o $@
20
21
22  .PHONY: clean run run-debug
23
24  clean:
25         rm -f *.o *.dbg.o output output_dbg
26
27  run: output
28         ./output
29
30  run-debug: output_dbg
31         gdb ./output_dbg

```

1.2.2 Run build

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_2
2 clang -Wall -Wextra -c coffeemachine_api.c -o coffeemachine_api.o
3 clang -Wall -Wextra -c coffeemachine_functionality.c -o coffeemachine_functionality.o
4 coffeemachine_functionality.c:155:28: warning: unused parameter 'keymask' [-Wunused-parameter]
5 155 | void changePrices(unsigned keymask)
6     |                  ^
7 1 warning generated.
8 clang -Wall -Wextra -c coffeemachine_main.c -o coffeemachine_main.o
9 clang -o output coffeemachine_api.o coffeemachine_functionality.o coffeemachine_main.o -Wall -Wextra
10 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> ./output
11 Coffee Machine> ^ C

```

1.2.3 Run build again

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main) [SIGINT]> make -f Makefile_2
2 make: 'output' is up to date.

```

1.2.4 Run clean

Terminal Output

```
1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main) [2]> make -f Makefile_2 clean
2 rm -f *.o *.dbg.o output output_dbg
```

1.2.5 Run Run without build before

Terminal Output

```
1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_2 run
2 clang -Wall -Wextra -c coffeemachine_api.c -o coffeemachine_api.o
3 clang -Wall -Wextra -c coffeemachine_functionality.c -o coffeemachine_functionality.o
4 coffeemachine_functionality.c:155:28: warning: unused parameter 'keymask' [-Wunused-parameter]
5     155 | void changePrices(unsigned keymask)
6         |                  ^
7 1 warning generated.
8 clang -Wall -Wextra -c coffeemachine_main.c -o coffeemachine_main.o
9 clang -o output coffeemachine_api.o coffeemachine_functionality.o coffeemachine_main.o -Wall -
10 Wextra
11 ./output
Coffee Machine> ^Cmake: *** [Makefile_2:28: run] Interrupt
```

1.2.6 Run debug build

Terminal Output

```
1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_2 output_dbg
2 clang -Wall -Wextra -g -O0 -c coffeemachine_api.c -o coffeemachine_api.dbg.o
3 clang -Wall -Wextra -g -O0 -c coffeemachine_functionality.c -o coffeemachine_functionality.
4 dbg.o
5 coffeemachine_functionality.c:155:28: warning: unused parameter 'keymask' [-Wunused-parameter]
6     155 | void changePrices(unsigned keymask)
7         |                  ^
8 1 warning generated.
9 clang -Wall -Wextra -g -O0 -c coffeemachine_main.c -o coffeemachine_main.dbg.o
10 clang -o output_dbg coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o
11 coffeemachine_main.dbg.o -Wall -Wextra
12 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> gdb ./output_dbg
13 GNU gdb (Fedora Linux) 16.3-1.fc42
14 Copyright (C) 2024 Free Software Foundation, Inc.
15 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
16 This is free software: you are free to change and redistribute it.
17 There is NO WARRANTY, to the extent permitted by law.
18 Type "show copying" and "show warranty" for details.
19 This GDB was configured as "x86_64-redhat-linux-gnu".
20 Type "show configuration" for configuration details.
21 For bug reporting instructions, please see:
22 <https://www.gnu.org/software/gdb/bugs/>.
23 Find the GDB manual and other documentation resources online at:
24 <http://www.gnu.org/software/gdb/documentation/>.
25 For help, type "help".
26 Type "apropos word" to search for commands related to "word"...
27 Reading symbols from ./output_dbg...
(gdb) exit
```

1.2.7 Run debug-run

Terminal Output

```
1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> make -f Makefile_2 run-debug
2 clang -Wall -Wextra -g -O0 -c coffeemachine_api.c -o coffeemachine_api.dbg.o
3 clang -Wall -Wextra -g -O0 -c coffeemachine_functionality.c -o coffeemachine_functionality.
4 dbg.o
5 coffeemachine_functionality.c:155:28: warning: unused parameter 'keymask' [-Wunused-parameter]
6     155 | void changePrices(unsigned keymask)
7         |                  ^
8 1 warning generated.
```

```

8 clang -Wall -Wextra -g -O0 -c coffeemachine_main.c -o coffeemachine_main.dbg.o
9 clang -o output_dbg coffeemachine_api.dbg.o coffeemachine_functionality.dbg.o
   coffeemachine_main.dbg.o -Wall -Wextra
10 gdb ./output_dbg
11 GNU gdb (Fedora Linux) 16.3-1.fc42
12 Copyright (C) 2024 Free Software Foundation, Inc.
13 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
14 This is free software: you are free to change and redistribute it.
15 There is NO WARRANTY, to the extent permitted by law.
16 Type "show copying" and "show warranty" for details.
17 This GDB was configured as "x86_64-redhat-linux-gnu".
18 Type "show configuration" for configuration details.
19 For bug reporting instructions, please see:
20 <https://www.gnu.org/software/gdb/bugs/>.
21 Find the GDB manual and other documentation resources online at:
22 <http://www.gnu.org/software/gdb/documentation/>.
23
24 For help, type "help".
25 Type "apropos word" to search for commands related to "word"...
26 Reading symbols from ./output_dbg...
27 (gdb) exit

```

1.2.8 Test with gdb

Terminal Output

```

1 flashfish@fedora ~/D/R/F/B/U/coffeemachine (main)> gdb ./output_dbg
2 GNU gdb (Fedora Linux) 16.3-1.fc42
3 Copyright (C) 2024 Free Software Foundation, Inc.
4 License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
5 This is free software: you are free to change and redistribute it.
6 There is NO WARRANTY, to the extent permitted by law.
7 Type "show copying" and "show warranty" for details.
8 This GDB was configured as "x86_64-redhat-linux-gnu".
9 Type "show configuration" for configuration details.
10 For bug reporting instructions, please see:
11 <https://www.gnu.org/software/gdb/bugs/>.
12 Find the GDB manual and other documentation resources online at:
13 <http://www.gnu.org/software/gdb/documentation/>.
14
15 For help, type "help".
16 Type "apropos word" to search for commands related to "word"...
17 Reading symbols from ./output_dbg...
18 (gdb) list
19 2
20 3     #include "coffeemachine_api.h"
21 4
22 5     //-----
23 6     int main()
24 7     {
25 8         activateCoffeeMachine();
26 9         return 0;
27 10    }
28 11
29 (gdb) b 8
30 Breakpoint 1 at 0x400f0f: file coffeemachine_main.c, line 8.
31 (gdb) run
32 Starting program: /home/flashfish/Documents/Repo/FH/BSY3/Uebung03/coffeemachine/output_dbg
33
34 This GDB supports auto-downloading debuginfo from the following URLs:
35 <https://debuginfod.fedoraproject.org/>
36 Enable debuginfod for this session? (y or [n]) y
37 Debuginfod has been enabled.
38 To make this setting permanent, add 'set debuginfod enabled on' to .gdbinit.
39 [Thread debugging using libthread_db enabled]
40 Using host libthread_db library "/lib64/libthread_db.so.1".
41
42 Breakpoint 1, main () at coffeemachine_main.c:8
43 8         activateCoffeeMachine();
44 (gdb) step
45 activateCoffeeMachine () at coffeemachine_api.c:21
46 21         unsigned char kbd_input = '\0';
47 (gdb) list
48 16         //-----
49 17         // The main function that activates the machine. Here the endless loop

```



```
50 18      // for the keyboard input dispatcher of the simulator is located.
51 19
52 20      void activateCoffeeMachine() {
53 21          unsigned char kbd_input = '\0';
54 22
55 23          for (;;) {
56 24              printf("Coffee Machine> ");
57 25              kbd_input = getchar();
58 (gdb) step
59 24              printf("Coffee Machine> ");
60 (gdb) print kbd_input
61 $1 = 0 '\000'
```