

Презентация по лабораторной работе №13

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Лабораторная работа №13

Цель работы

Приобрести простейшие навыки разработки, анализа, тестирования и отладки приложений в ОС типа UNIX/Linux на примере создания на языке программирования С калькулятора с простейшими функциями.

File Edit Options Buffers Tools C Help



Save



Undo



////////////////////////////////////

// calculate.h

#ifndef CALCULATE_H_

#define CALCULATE_H_

float Calculate(float Numeral, char Operation[4]);

#endif /*CALCULATE_H_*/

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Save



Undo



```
////////////////////////////////////  
// calculate.c
```

```
#include <stdio.h>  
#include <math.h>  
#include <string.h>  
#include "calculate.h"  
  
float  
Calculate(float Numeral, char Operation[4])  
{  
    float SecondNumeral;  
    if(strncmp(Operation, "+", 1) == 0)  
    {  
        printf("Второе слагаемое: ");  
        scanf("%f",&SecondNumeral);  
        return(Numeral + SecondNumeral);  
    }  
    else if(strncmp(Operation, "-", 1) == 0)  
    {  
        printf("Вычитаемое: ");  
        scanf("%f",&SecondNumeral);  
        return(Numeral - SecondNumeral);  
    }  
    else if(strncmp(Operation, "*", 1) == 0)  
    {  
        printf("Множитель: ");  
        scanf("%f",&SecondNumeral);  
        return(Numeral * SecondNumeral);  
    }  
    else if(strncmp(Operation, "/", 1) == 0)  
    {  
        printf("Делитель: ");  
        scanf("%f",&SecondNumeral);
```

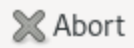
U:--- calculate.c Top L34 (C/*l Abbrev)

menu-bar file open-file

File Edit Options Buffers Tools C Isearch Help



Repeat Forward



Abort



Undo



Replace



Show Hits



Help

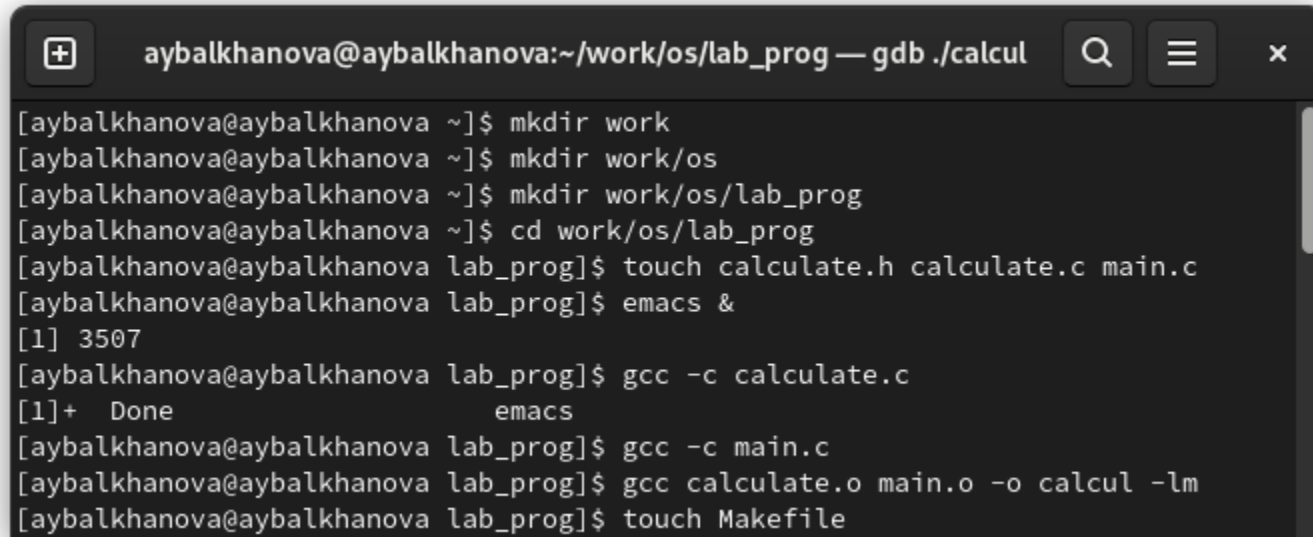
```
////////////////////////////////////  
// main.c
```

```
#include <stdio.h>  
#include "calculate.h"  
int  
main (void)  
{  
    float Numeral;  
    char Operation[4];  
    float Result;  
    printf("Число: ");  
    scanf("%f",&Numeral);  
    printf("Операция (+,-,*,/,pow,sqrt,sin,cos,tan): ");  
    scanf("%s",&Operation);  
    Result = Calculate(Numeral, Operation);  
    printf("%6.2f\n",Result);  
    return 0;  
}
```

U:**- main.c All L19 (C/*l Abbrev Isearch)

I-search:

Выполнила компиляцию программы посредством gcc



```
aybalkhanova@aybalkhanova:~/work/os/lab_prog — gdb ./calcul
[aybalkhanova@aybalkhanova ~]$ mkdir work
[aybalkhanova@aybalkhanova ~]$ mkdir work/os
[aybalkhanova@aybalkhanova ~]$ mkdir work/os/lab_prog
[aybalkhanova@aybalkhanova ~]$ cd work/os/lab_prog
[aybalkhanova@aybalkhanova lab_prog]$ touch calculate.h calculate.c main.c
[aybalkhanova@aybalkhanova lab_prog]$ emacs &
[1] 3507
[aybalkhanova@aybalkhanova lab_prog]$ gcc -c calculate.c
[1]+  Done                  emacs
[aybalkhanova@aybalkhanova lab_prog]$ gcc -c main.c
[aybalkhanova@aybalkhanova lab_prog]$ gcc calculate.o main.o -o calcul -lm
[aybalkhanova@aybalkhanova lab_prog]$ touch Makefile
```

File Edit Options Buffers Tools Makefile Help



Save



Undo



```
#  
# Makefile  
#  
  
CC = gcc  
CFLAGS =  
LIBS = -lm  
  
calcul: calculate.o main.o  
    gcc calculate.o main.o -o calcul $(LIBS)  
  
calculate.o: calculate.c calculate.h  
    gcc -c calculate.c $(CFLAGS)  
  
main.o: main.c calculate.h  
    gcc -c main.c $(CFLAGS)  
  
clean:  
    -rm calcul *.o *~  
  
# End Makefile
```


С помощью gdb выполнила отладку программы calcul

```
aybalkhanova@aybalkhanova:~/work/os/lab_prog — gdb ./calcul
GNU gdb (GDB) Fedora 10.2-9.fc35
Copyright (C) 2021 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-redhat-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 ./calcul...
(gdb) run
Starting program: /home/aybalkhanova/work/os/lab_prog/calcul
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib64/libthread_db.so.1".
Число: 5
Операция (+,-,*,/,pow,sqrt,sin,cos,tan): -
Вычитаемое: 3
  2.00
[Inferior 1 (process 5115) exited normally]
(gdb)
```

Установила точку останова

```
aybalkhanova@aybalkhanova:~/work/os/lab_prog — gdb ./calcul
13     scanf("%f",&Numeral);
14     printf("Операция (+,-,*,/,pow,sqrt,sin,cos,tan): ");
15     scanf("%s",&Operation);
(gdb) list calculate.c:20,29
20     {
21     printf("Вычитаемое: ");
22     scanf("%f",&SecondNumeral);
23     return(Numeral - SecondNumeral);
24     }
25     else if(strncmp(Operation, "*", 1) == 0)
26     {
27     printf("Множитель: ");
28     scanf("%f",&SecondNumeral);
29     return(Numeral * SecondNumeral);
(gdb) list calculate.c:20,27
20     {
21     printf("Вычитаемое: ");
22     scanf("%f",&SecondNumeral);
23     return(Numeral - SecondNumeral);
24     }
25     else if(strncmp(Operation, "*", 1) == 0)
26     {
27     printf("Множитель: ");
(gdb) break 21
Breakpoint 1 at 0x40120f: file calculate.c, line 21.
(gdb) 
```

Вывод

Я приобрела простейшие навыки разработки, анализа, тестирования и отладки приложений в ОС типа UNIX/Linux на примере создания на языке программирования С калькулятора с простейшими функциями.

Спасибо за внимание