# Презентация по лабораторной работе

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# Цель работы

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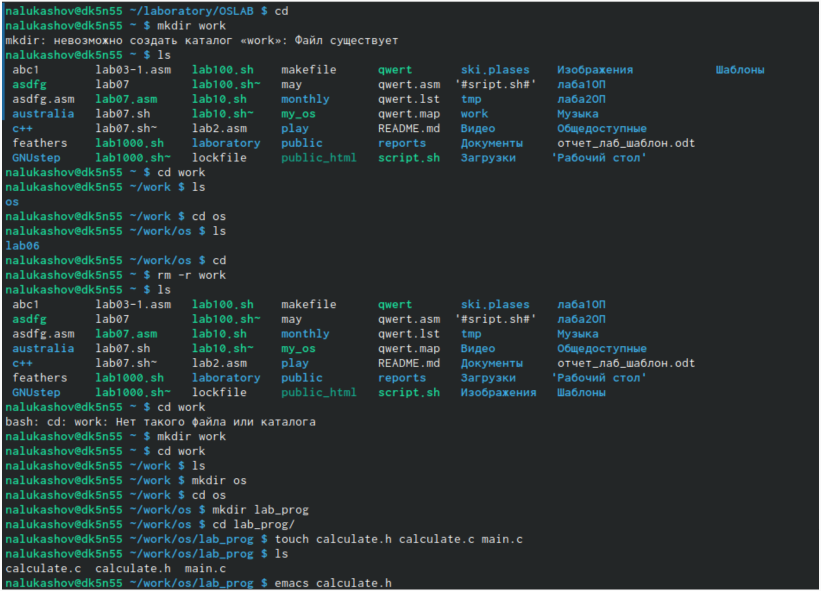
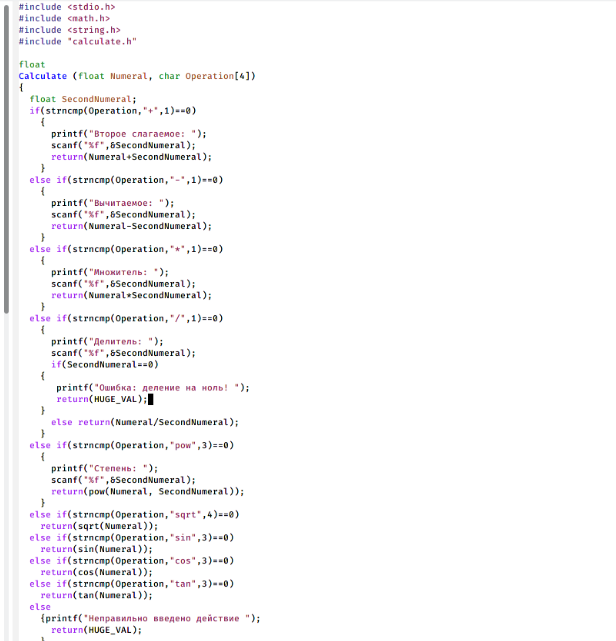
Изучить основы программирования в оболочке ОС UNIX. Научиться писать бо-лее сложные командные файлы с использованием логических управляющих кон-струкций и циклов.

# Слайд 1



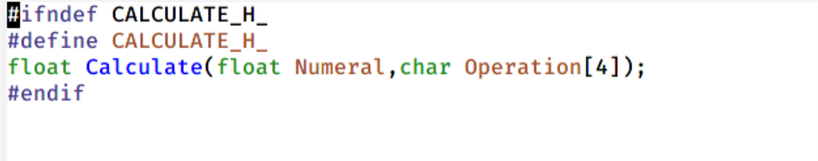
```
nalukashov@dk5n55 ~/laboratory/OSLAB $ cd
nalukashov@dk5n55 ~ $ mkdir work
mkdir: невозможно создать каталог «work»: Файл существует
nalukashov@dk5n55 ~ $ ls
 abc1        lab03-1.asm   lab100.sh    makefile      qwert       ski.plases    Изображения            Шаблоны
 asdfg       lab07         lab100.sh~   may           qwert.asm  '#sript.sh#'   лаба1ОП
 asdfg.asm   lab07.asm     lab10.sh     monthly       qwert.lst   tmp           лаба2ОП
 australia   lab07.sh      lab10.sh~    my_os         qwert.map   work          Музыка
 c++         lab07.sh~     lab2.asm     play          README.md   Видео         Общедоступные
 feathers    lab1000.sh    laboratory   public        reports     Документы     отчет_лаб_шаблон.odt
 GNUstep     lab1000.sh~   lockfile     public_html   script.sh   Загрузки     'Рабочий стол'
nalukashov@dk5n55 ~ $ cd work
nalukashov@dk5n55 ~/work $ ls
os
nalukashov@dk5n55 ~/work $ cd os
nalukashov@dk5n55 ~/work/os $ ls
lab06
nalukashov@dk5n55 ~/work/os $ cd
nalukashov@dk5n55 ~ $ rm -r work
nalukashov@dk5n55 ~ $ ls
 abc1        lab03-1.asm   lab100.sh    makefile      qwert       ski.plases    лаба1ОП
 asdfg       lab07         lab100.sh~   may           qwert.asm  '#sript.sh#'   лаба2ОП
 asdfg.asm   lab07.asm     lab10.sh     monthly       qwert.lst   tmp           Музыка
 australia   lab07.sh      lab10.sh~    my_os         qwert.map   Видео         Общедоступные
 c++         lab07.sh~     lab2.asm     play          README.md   Документы     отчет_лаб_шаблон.odt
 feathers    lab1000.sh    laboratory   public        reports     Загрузки     'Рабочий стол'
 GNUstep     lab1000.sh~   lockfile     public_html   script.sh   Изображения   Шаблоны
nalukashov@dk5n55 ~ $ cd work
bash: cd: work: Нет такого файла или каталога
nalukashov@dk5n55 ~ $ mkdir work
nalukashov@dk5n55 ~ $ cd work
nalukashov@dk5n55 ~/work $ ls
nalukashov@dk5n55 ~/work $ mkdir os
nalukashov@dk5n55 ~/work $ cd os
nalukashov@dk5n55 ~/work/os $ mkdir lab_prog
nalukashov@dk5n55 ~/work/os $ cd lab_prog/
nalukashov@dk5n55 ~/work/os/lab_prog $ touch calculate.h calculate.c main.c
nalukashov@dk5n55 ~/work/os/lab_prog $ ls
calculate.c  calculate.h  main.c
nalukashov@dk5n55 ~/work/os/lab_prog $ emacs calculate.h
```

# Слайд 2



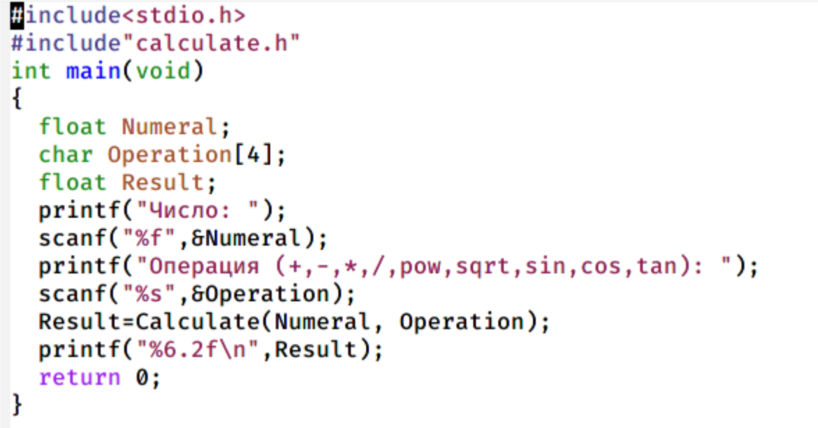
```
#include <stdio.h>
#include <math.h>
#include <string.h>
#include "calculate.h"

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);
      if(SecondNumeral==0)
    {
       printf("Ошибка: деление на ноль! ");
       return(HUGE_VAL);
    }
      else return(Numeral/SecondNumeral);
    }
  else if(strncmp(Operation,"pow",3)==0)
    {
      printf("Степень: ");
      scanf("%f",&SecondNumeral);
      return(pow(Numeral, SecondNumeral));
    }
  else if(strncmp(Operation,"sqrt",4)==0)
    return(sqrt(Numeral));
  else if(strncmp(Operation,"sin",3)==0)
    return(sin(Numeral));
  else if(strncmp(Operation,"cos",3)==0)
    return(cos(Numeral));
  else if(strncmp(Operation,"tan",3)==0)
    return(tan(Numeral));
  else
    {printf("Неправильно введено действие ");
      return(HUGE_VAL);
```

# Слайд 3



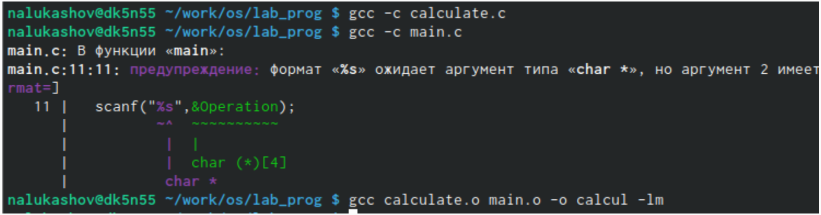
```
#ifndef CALCULATE_H_
#define CALCULATE_H_
float Calculate(float Numeral,char Operation[4]);
#endif
```

# Слайд 4



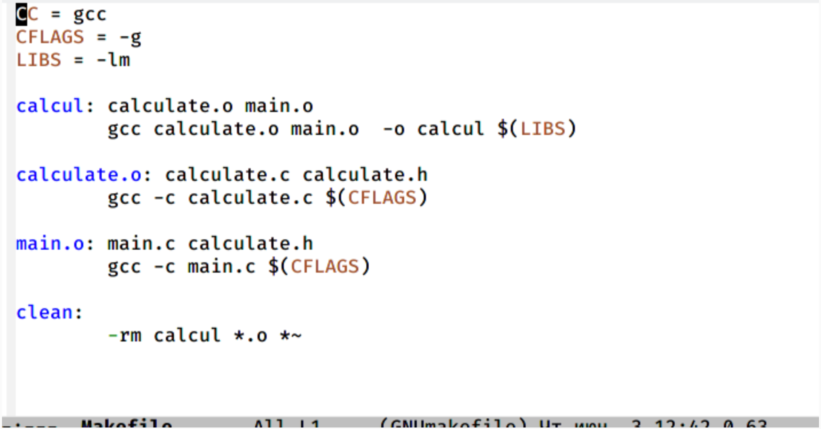
```
#include<stdio.h>
#include"calculate.h"
int main(void)
{
  float Numeral;
  char Operation[4];
  float Result;
  printf("Число: ");
  scanf("%f",&Numeral);
  printf("Операция (+,-,*,/,pow,sqrt,sin,cos,tan): ");
  scanf("%s",&Operation);
  Result=Calculate(Numeral, Operation);
  printf("%6.2f\n",Result);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

# Слайд 5



```
nalukashov@dk5n55 ~/work/os/lab_prog $ gcc -c calculate.c
nalukashov@dk5n55 ~/work/os/lab_prog $ gcc -c main.c
main.c: В функции «main»:
main.c:11:11: предупреждение: формат «%s» ожидает аргумент типа «char *», но аргумент 2 имеет
rmat=]
   11 |   scanf("%s",&Operation);
      |          ~^  ~~~~~~~~~~
      |           |  |
      |           |  char (*)[4]
      |           char *
nalukashov@dk5n55 ~/work/os/lab_prog $ gcc calculate.o main.o -o calcul -lm
```

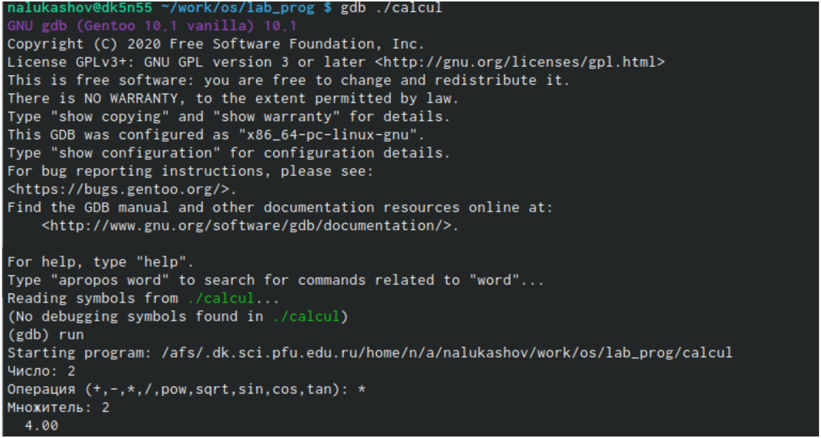
# Слайд 6



```
CC = gcc
CFLAGS = -g
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 *~
```

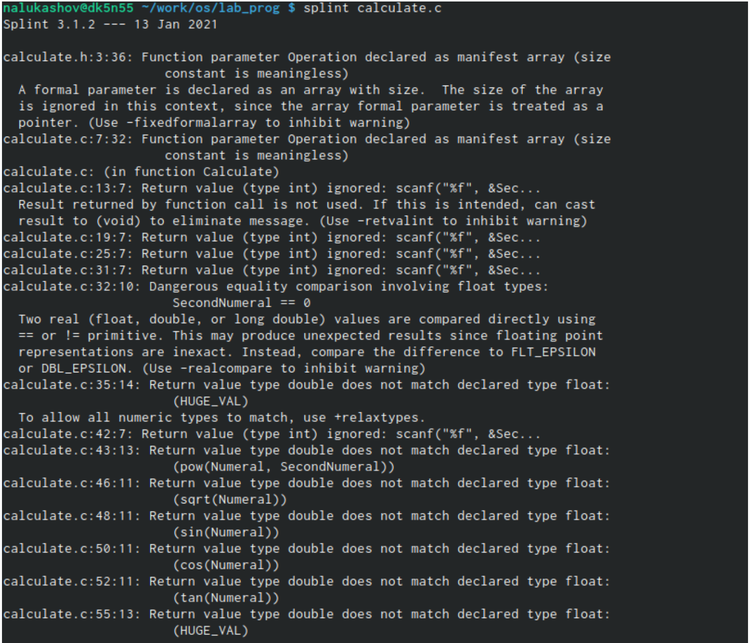
```
-:---  Makefile       All L1      (GNUmakefile) Чт июн  3 12:42 0.63
```

# Слайд 7



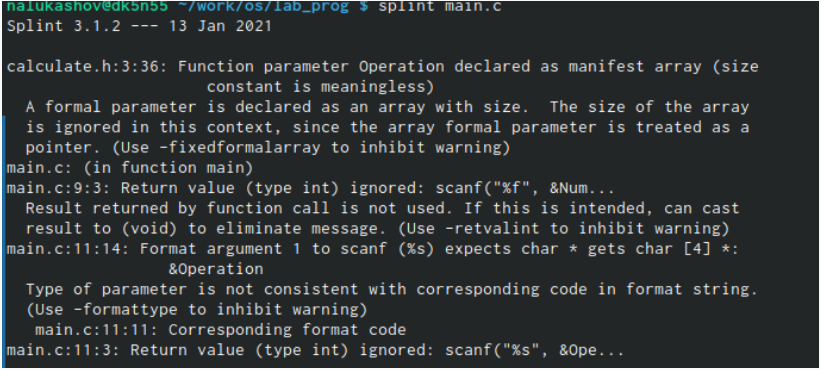
```
nalukashov@dk5n55 ~/work/os/lab_prog $ gdb ./calcul
GNU gdb (Gentoo 10.1 vanilla) 10.1
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-pc-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://bugs.gentoo.org/>.
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...
(No debugging symbols found in ./calcul)
(gdb) run
Starting program: /afs/.dk.sci.pfu.edu.ru/home/n/a/nalukashov/work/os/lab_prog/calcul
Число: 2
Операция (+,-,*,/,pow,sqrt,sin,cos,tan): *
Множитель: 2
  4.00
```

# Слайд 8



```
nalukashov@dk5n55 ~/work/os/lab_prog $ splint calculate.c
Splint 3.1.2 --- 13 Jan 2021

calculate.h:3:36: Function parameter Operation declared as manifest array (size
                     constant is meaningless)
  A formal parameter is declared as an array with size.  The size of the array
  is ignored in this context, since the array formal parameter is treated as a
  pointer. (Use -fixedformalarray to inhibit warning)
calculate.c:7:32: Function parameter Operation declared as manifest array (size
                     constant is meaningless)
calculate.c: (in function Calculate)
calculate.c:13:7: Return value (type int) ignored: scanf("%f", &Sec...
  Result returned by function call is not used. If this is intended, can cast
  result to (void) to eliminate message. (Use -retvalint to inhibit warning)
calculate.c:19:7: Return value (type int) ignored: scanf("%f", &Sec...
calculate.c:25:7: Return value (type int) ignored: scanf("%f", &Sec...
calculate.c:31:7: Return value (type int) ignored: scanf("%f", &Sec...
calculate.c:32:10: Dangerous equality comparison involving float types:
                      SecondNumeral == 0
  Two real (float, double, or long double) values are compared directly using
  == or != primitive. This may produce unexpected results since floating point
  representations are inexact. Instead, compare the difference to FLT_EPSILON
  or DBL_EPSILON. (Use -realcompare to inhibit warning)
calculate.c:35:14: Return value type double does not match declared type float:
                      (HUGE_VAL)
  To allow all numeric types to match, use +relaxtypes.
calculate.c:42:7: Return value (type int) ignored: scanf("%f", &Sec...
calculate.c:43:13: Return value type double does not match declared type float:
                      (pow(Numeral, SecondNumeral))
calculate.c:46:11: Return value type double does not match declared type float:
                      (sqrt(Numeral))
calculate.c:48:11: Return value type double does not match declared type float:
                      (sin(Numeral))
calculate.c:50:11: Return value type double does not match declared type float:
                      (cos(Numeral))
calculate.c:52:11: Return value type double does not match declared type float:
                      (tan(Numeral))
calculate.c:55:13: Return value type double does not match declared type float:
                      (HUGE_VAL)
```

# Слайд 9



```
nalukashov@dk5n55 ~/work/os/lab_prog $ splint main.c
Splint 3.1.2 --- 13 Jan 2021

calculate.h:3:36: Function parameter Operation declared as manifest array (size
                     constant is meaningless)
  A formal parameter is declared as an array with size.  The size of the array
  is ignored in this context, since the array formal parameter is treated as a
  pointer. (Use -fixedformalarray to inhibit warning)
main.c: (in function main)
main.c:9:3: Return value (type int) ignored: scanf("%f", &Num...
  Result returned by function call is not used. If this is intended, can cast
  result to (void) to eliminate message. (Use -retvalint to inhibit warning)
main.c:11:14: Format argument 1 to scanf (%s) expects char * gets char [4] *:
                 &Operation
  Type of parameter is not consistent with corresponding code in format string.
  (Use -formattype to inhibit warning)
   main.c:11:11: Corresponding format code
main.c:11:3: Return value (type int) ignored: scanf("%s", &Ope...
```

# Выводы

# Выводы

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