

ALEXANDER RUDI

Pointer

Array

Loop

Structure

Data

C Programming Basics

MYCROMARS HAWK

Alexander Rudi
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C PROGRAMMING BASICS

Alexander Rudi

**This book covers the fundamentals of C programming, with 44 examples.
It has 10 main topics, which can be selected via a menu. Some topics have various program examples.**

Learn how to code in C with this book, run the program and compare the result with the source code.
Expand the program with your own developments. Use this program as a basis for your programs.

You can find the source code on the website: <https://www.mycromars.com>

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Prologue

During my time developing games, learning C allowed me to program better and faster in Game Maker. This also enabled me to solve difficult and complex tasks that arose during game development. I have read some books and taken online courses in C programming. This book is a documentation of a C program that helps you write your own programs.

Who is this book for?

It's not for absolute beginners; some prior knowledge is required. You should know how to install and set up a code editor for C programming and have read a book for beginners on C programming. In this book I used Visual Studio Code.

I have tested the program on Windows and macOS. On macOS, certain libraries need to be integrated directly into the respective programs; I have already included the necessary instructions and paths in the opening lines of each program. You simply need to activate them (remove the two slashes //).

You don't have to create the chapters one after another; you can jump straight to the first program "A" in any chapter and start there.

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Overview

What does this program contain?

It contains a file containing the main menu: MYCROMARS-HAWK.c

A header.h file containing the address of all other header and source files.

And two folders:

- header containing all header files
- source for all individual programs

Let's start with the main folder content.

It should look like this:

- MYCROMARS-HAWK
 - header
 - header.h
 - MYCROMARS-HAWK.c
 - source

The programs can be stored in the source folder with the extension ".c," e.g.: program.c

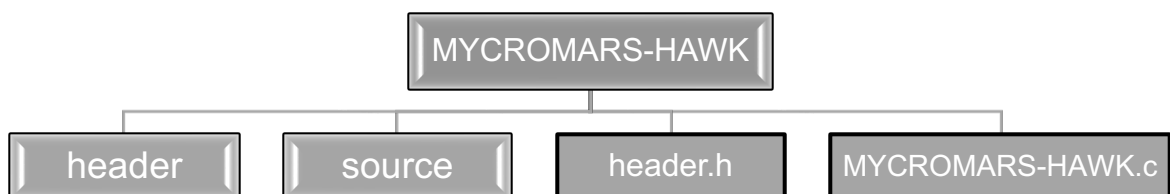
For each program, a header file should be created and stored in the header folder, with the extension ".h" e.g.: program.h

We'll start with the first program: Exit

But before we can begin, we need to create the main menu in: MYCROMARS-HAWK.c

We start always this file to execute the program. The output will be seen in the terminal window.

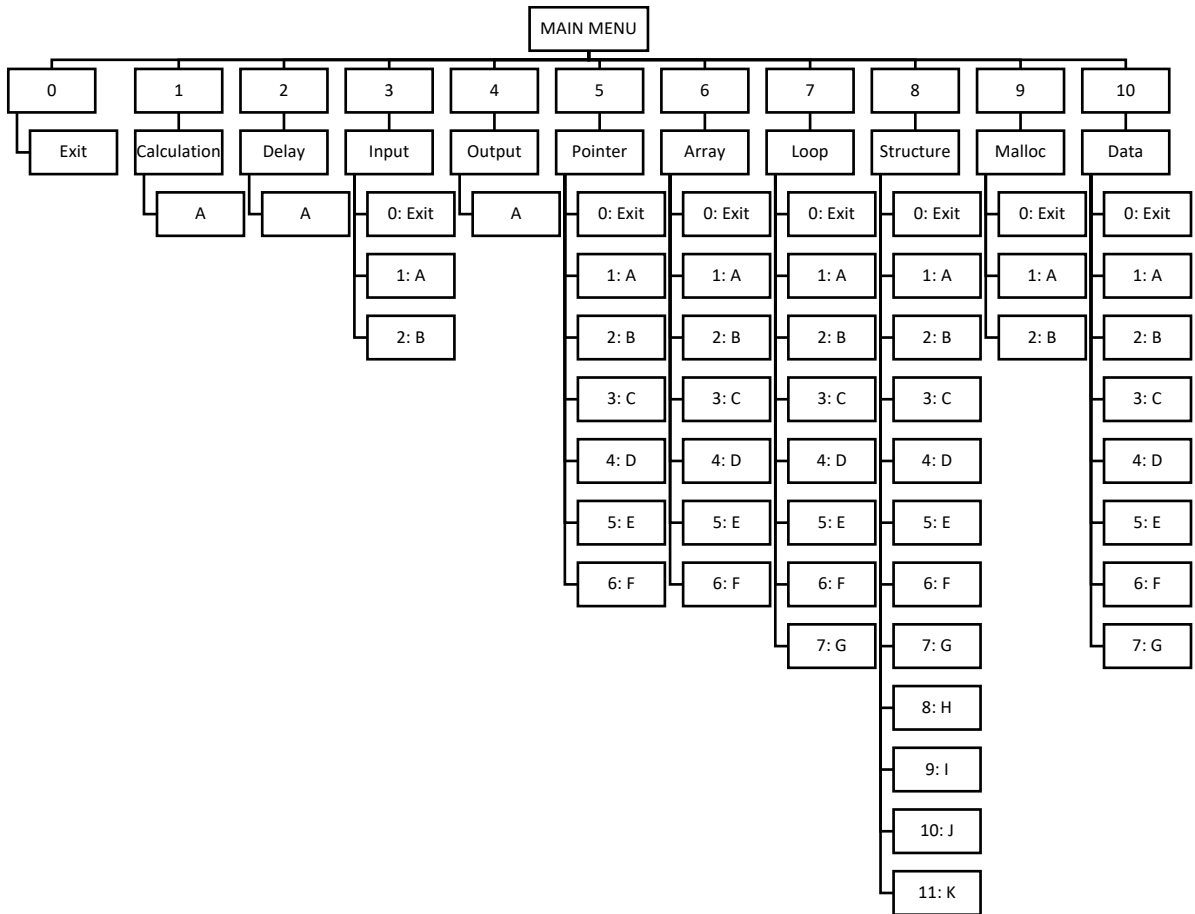
Main folder content:



If there was a submenu later in this book, you have to look always at the first program "A" at first.

It contains the submenu for the following programs ...B, C, D...

Program structure



MAIN MENU

Here you can see the structure of the "MAIN MENU". It's best to copy the code into the file.

- MYCROMARS-HAWK.c

At the beginning you see a little information about the author, followed by integrate the **header.h** file.

- `#include "header.h"`

This is followed by a small area for catching incorrect inputs (not a number), with a length of 50 characters.

The menu expects a number between 1 and 10, and at the end of the menu, a function is called if the input is incorrect / not a number. Otherwise, your input will be used for the next input with `scanf()` in the main function.

If characters are entered, the program aborts and returns to the start of the main menu, where those characters are inadvertently interpreted as a new input.

- `void scanString0(void)`

Now comes the main menu, with 10 menu items. Use 0 to exit the program.

The main menu consists of these 10 functions, with their main topics. They are initially disabled because otherwise, a program error would occur. After the programs have been added, the menu items can be enabled. We will enable the first menu item as soon as we have implemented the first program. The menu itself is a loop; as soon as a program has finished running or is aborted, you end up back in the main menu or the program will be closed. Some menu items have another submenu.

```
mainMenu_0(&menuB);
mainMenu_1(&menuB);
mainMenu_2(&menuB);
mainMenu_3(&menuB);
mainMenu_4(&menuB);
mainMenu_5(&menuB);
mainMenu_6(&menuB);
mainMenu_7(&menuB);
mainMenu_8(&menuB);
mainMenu_9(&menuB);
mainMenu_10(&menuB);
```

***** Here you start *****

Write the code into the files, or copy and paste it from here.

Code for: MYCROMARS-HAWK.c

```
/*
MYCROMARS HAWK V1.0.5
C programming basics
```

```
Copyright (C) 2026 Alexander Rudi
Licensed: GNU General Public License v3.0
```

```
Source code:
https://github.com/MYCROMARS/MYCROMARS-HAWK
```

```
Contact:
https://www.mycromars.com
info@mycromars.com
```

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```
*/

// header file
#include "header.h"

// useful:
// #include <windows.h>

// Create
char buffer[50];

// Function: Catch invalid input
void scanString0(void){
    // Input
    scanf("%s", &buffer[0]);
}

// Main function
int main()
{
    // Output
    printf("\n");
    printf("MYCROMARS HAWK V1.0.5\n");
    printf("C programming basics\n\n");

    printf("MYCROMARS HAWK Copyright (C) 2026 Alexander Rudi\n");
    printf("This program comes with ABSOLUTELY NO WARRANTY\n");
    printf("This is free software, and you are welcome to redistribute it \
        under certain conditions.\n");
    printf("Licensed: GNU General Public License v3.0\n");
    printf("https://www.mycromars.com\n");

    // Create & assign (initialize)
    int menu = 0;
    int menuB = 0;

    // Jump mark
    mainMenu:

    // Output
    printf("*** MAIN MENU ***\n");
    printf("Press: (0) EXIT \n");
    printf("Press: (1) CALCULATION | (2) DELAY | (3) INPUT | (4) OUTPUT\n");
    printf("Press: (5) POINTER      | (6) ARRAY | (7) LOOP  | (8) STRUCTURE\n");
    printf("Press: (9) MALLOC         | (10) DATA\n");

    printf("Your input: ");
```

```

// Conditional statement: Input
if (scanf("%d", &menu)) {

    // Wrong number, not 1..10
    if (menu < 0 || menu > 10){

        // Output
        printf("\nInput is wrong, not 1..10\n\n");

        // Jump to
        goto mainMenu;
    }

    // Switch-case statement
    switch (menu)
    {
        case 0:
            /* Function: Exit */
            //mainMenu_0(&menuB);

        case 1:
            /* Function: Calculation */
            //mainMenu_1(&menuB);
            break;

        case 2:
            /* Function: Delay */
            //mainMenu_2(&menuB);
            break;

        case 3:
            /* Function: Input */
            //mainMenu_3(&menuB);
            break;

        case 4:
            /* Function: Output */
            //mainMenu_4(&menuB);
            break;

        case 5:
            /* Function: Pointer */
            //mainMenu_5(&menuB);
            break;

        case 6:
            /* Function: Array */
            //mainMenu_6(&menuB);
            break;

        case 7:
            /* Function: Loop */
            //mainMenu_7(&menuB);
            break;

        case 8:

```