

Sprint 02

Marathon C

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u code

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Engage



DESCRIPTION

Ah C, here we go again.

We hope that the first acquaintance with the C language was successful.

Using standard functions makes writing code easier, but we believe that it is better to understand everything from the inside and come up with an algorithm for writing a function by yourself.

Imagine how it will be great if you understand why a particular function works that way.

In this sprint, you will rewrite some standard functions and implement the basics of mathematics in C.

BIG IDEA

Learn to use C to solve real-world problems.

ESSENTIAL QUESTION

How to maximize the benefits of peer-to-peer?

CHALLENGE

Start delving into C language.

Investigate



GUIDING QUESTIONS

We invite you to find answers to the following questions. This will help you realize what knowledge you will get from this challenge and how to move forward.

Ask your neighbor on the right, left, or behind you, and discuss the following questions together. You can find the answers in the Internet and share it with student around you.

We encourage you to ask as many questions about C programming as possible. Note down your discussion.

- Well, how do you like C?
- How is your sprint yesterday? How much tasks have you done?
- What topics were unclear to you?
- What is functions (ofc in programming)? What is loop?
- How to use standard functions?
- Do you know what is stdout?
- How to print text to console?
- How many letters in the English alphabet?
- What is the difference between a digit and a number?

GUIDING ACTIVITIES

These are only a set of example activities and resources. Do not forget that you have a limited time to overcome the challenge. Use it wisely. Distribute tasks correctly.

1. Repeat the basics from yesterday. Try to output your name to standard output using C. And also using Unix command.
2. Try to compile the written code and run your program. Does it work as you expected?
3. Use some standard functions. Just for fun. Try to use `getchar`, `gets` and `puts`.



ANALYSIS

You need to analyze all the collected information before you start.

- Be attentive to all statements of the story. Examine the given examples carefully. They may contain details that are not mentioned in the task.
- Perform only those tasks that are given in the story.
- You should submit only the specified files in the required directory and nothing else. In case you are allowed to submit any files you should submit only files that you used to complete a task. Garbage shall not pass.
- You should compile C files with clang compiler and use these flags:
`-std=c11 -Wall -Wextra -Werror -Wpedantic`.
- You should use only functions which allowed in a certain task.
- Usage of forbidden functions is considered as cheat and your challenge will be failed.
- You must complete tasks according to the rules specified in `the Auditor`.
- Your exercises will be checked and graded by students. The same as you.
`Peer-to-Peer (P2P) learning`.
- Also, your exercises will pass automatic evaluation which is called `Oracle`.
- Got a question or you do not understand something? Ask the students or just Google that.
- Google every new word you have not heard before.
- Use your brain and follow the white rabbit to prove that you are the Chosen one!!!

Act



SOLUTION DEVELOPMENT

Let's get started! And may the odds be ever in your Favor!

1. Clone your git repository, what is issued on the challenge page in the LMS.
2. Open the story and read it!
3. Arrange to brainstorm tasks with other students.
4. Try to realize your thoughts in code.

Task 00



NAME

Positive or negative

DIRECTORY

```
t00/
```

SUBMIT

```
mx_is_positive.c, mx_printstr.c, mx_strlen.c
```

ALLOWED FUNCTIONS

```
write
```

DESCRIPTION

Create a function which will output `positive`, `negative` or `zero` followed by the newline on the standard output whether number is positive, negative or equals to 0.

SYNOPSIS

```
void mx_is_positive(int i);
```

EXAMPLE

```
mx_is_positive(2); //prints positive
```

FOLLOW THE WHITE RABBIT

```
man 2 write
```



Task 01

NAME

Odd or even

DIRECTORY

```
t01/
```

SUBMIT

```
mx_is_odd.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which checks whether a number is even or odd.

RETURN

Function returns `true` if number is odd or `false` if number is even.

SYNOPSIS

```
bool mx_is_odd(int value);
```

EXAMPLE

```
mx_is_odd(1); //returns true
```


Task 02



NAME

Is alphabetic?

DIRECTORY

```
t02/
```

SUBMIT

```
mx_isalpha.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `isalpha`.

SYNOPSIS

```
bool mx_isalpha(int c);
```

EXAMPLE

```
mx_isalpha('a'); //returns 1
```

FOLLOW THE WHITE RABBIT

```
man isalpha
```

Task 03



NAME

Is digit?

DIRECTORY

```
t03/
```

SUBMIT

```
mx_isdigit.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `isdigit`.

SYNOPSIS

```
bool mx_isdigit(int c);
```

EXAMPLE

```
mx_isdigit('A'); //returns 0
```

FOLLOW THE WHITE RABBIT

```
man isdigit
```



Task 04

NAME

Is white-space?

DIRECTORY

t04/

SUBMIT

mx_isspace.c

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `isspace`.

SYNOPSIS

```
bool mx_isspace(char c);
```

EXAMPLE

```
mx_isspace(' '); //returns 1
```

FOLLOW THE WHITE RABBIT

man `isspace`

SEE ALSO

Whitespace character

Task 05



NAME

Is lower case?

DIRECTORY

```
t05/
```

SUBMIT

```
mx_islower.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `islower`.

SYNOPSIS

```
bool mx_islower(int c);
```

EXAMPLE

```
mx_islower('Z'); //returns 0
```

FOLLOW THE WHITE RABBIT

```
man islower
```



Task 06

NAME

Is upper case?

DIRECTORY

```
t06/
```

SUBMIT

```
mx_isupper.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `isupper`.

SYNOPSIS

```
bool mx_isupper(int c);
```

EXAMPLE

```
mx_isupper('Z'); //returns 1
```

FOLLOW THE WHITE RABBIT

```
man isupper
```

Task 07



NAME

To lower case

DIRECTORY

```
t07/
```

SUBMIT

```
mx_tolower.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `tolower`.

SYNOPSIS

```
int mx_tolower(int c);
```

EXAMPLE

```
mx_tolower('Z'); //returns z  
mx_tolower('z'); //returns z
```

FOLLOW THE WHITE RABBIT

```
man tolower
```



Task 08

NAME

To upper case

DIRECTORY

```
t08/
```

SUBMIT

```
mx_toupper.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which has the same behaviour as standard libc function `toupper`.

SYNOPSIS

```
int mx_toupper(int c);
```

EXAMPLE

```
mx_toupper('Z'); //returns Z  
mx_toupper('z'); //returns Z
```

FOLLOW THE WHITE RABBIT

```
man toupper
```



Task 09

NAME

Isosceles triangle

DIRECTORY

```
t09/
```

SUBMIT

```
mx_isos_triangle.c, mx_printchar.c
```

ALLOWED FUNCTIONS

```
write
```

DESCRIPTION

Create a function that outputs on the standard output isosceles triangle:

- with a given triangle side length and character to fill the figure;
- each row must be followed by the newline.

SYNOPSIS

```
void mx_isos_triangle(unsigned int length, char c);
```

CONSOLE OUTPUT

```
>./mx_isos_triangle | cat -e      # for mx_isos_triangle(3, '*');
*$
**$
***$
>
```




Task 10

NAME

Multiple of a number

DIRECTORY

```
t10/
```

SUBMIT

```
mx_multiple_number.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which will check whether natural number `mult` is a multiple of a number `n`.

RETURN

If number `mult` is a multiple of a number `n` function returns `true`, otherwise `false`.

SYNOPSIS

```
bool mx_multiple_number(int n, int mult);
```

EXAMPLE

```
mx_multiple_number(3, 9); //returns true
```



Task 11

NAME

Find maximum

DIRECTORY

```
t11/
```

SUBMIT

```
mx_max.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which will find a maximum number.

RETURN

Returns value of maximum number.

SYNOPSIS

```
int mx_max(int a, int b, int c);
```

EXAMPLE

```
mx_max(-1, 0, 1); //returns 1
```



Task 12

NAME

Middle number

DIRECTORY

```
t12/
```

SUBMIT

```
mx_mid.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which will find middle number.

RETURN

Returns value of middle number.

SYNOPSIS

```
int mx_mid(int a, int b, int c);
```

EXAMPLE

```
mx_mid(5, 16, 10); //returns 10  
mx_mid(5, 6, 6); //returns 6
```



Task 13

NAME

Sum digits

DIRECTORY

```
t13/
```

SUBMIT

```
mx_sum_digits.c
```

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function which will sum all digits of the number.

RETURN

Returns sum of all digits of the number.

SYNOPSIS

```
int mx_sum_digits(int num);
```

EXAMPLE

```
mx_sum_digits(435); //returns 12  
mx_sum_digits(-555); //returns 15
```



Task 14

NAME

Print integer

DIRECTORY

```
t14/
```

SUBMIT

```
mx_printint.c, mx_printchar.c
```

ALLOWED FUNCTIONS

```
write
```

DESCRIPTION

Create a function which will output integer values on the standard output.

SYNOPSIS

```
void mx_printint(int n);
```

EXAMPLE

```
mx_printint(25); //prints 25  
mx_printint(2147483647); //prints 2147483647
```

Share



PUBLISHING

The final important and integral stage of your work is its publishing. This allows you to share your challenges, solutions, and reflections with a local and global audience.

During this stage, you will find how to get a global assessment. You will get representative feedback. As a result, you get the maximum experience from the work you have done.

What you can create to disseminate information

- Text post, summary from reflection.
- Charts, infographics or any other ways to visualize your information.
- Video of your work, reflection video.
- Audio podcast. You can record a story with your experience.
- Photos from ucode with small post.

Example techniques

- [Canva](#) - a good way to visualize your data.
- QuickTime - easy way to record your screen, capture video, or record audio.

Example ways to share your experience

- [Facebook](#) - create a post that will inspire your friends.
- [YouTube](#) - upload a video.
- [GitHub](#) - share your solution.
- [Telegraph](#) - create a post. This is a good way to share information in a Telegram.
- [Instagram](#) - share a photos and stories from ucode. Don't forget to tag us :)

Share what you learned with your local community and the world. Use [#ucode](#) and [#CBLWorld](#) on social media.