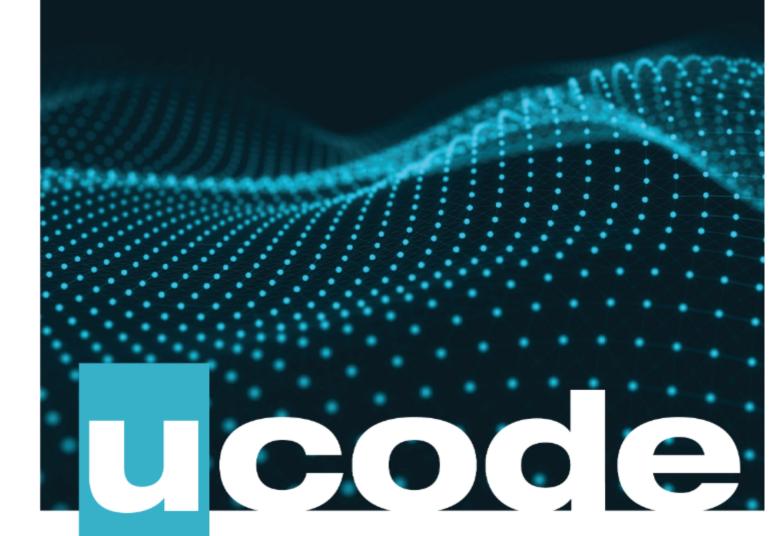
Sprint 01 Marathon C

April 15, 2020



Contents

Engage				٠.		 	 	٠.	٠.		٠.	٠.				2
Investigate				٠.		 	 								٠.	3
Act: Task 00 > Hello world				٠.		 	 									5
Act: Task 01 > Say wake up				٠.		 	 									6
Act: Task 02 > Write knock,	knoci	٠.		٠.		 	 									7
Act: Task 03 > Matrix voice				٠.		 	 									8
Act: Task 04 > Print characte	er			٠.		 	 									9
Act: Task 05 > Only printabl	e			٠.		 	 									10
Act: Task 06 > Hexadecimal				٠.		 	 								٠.	11
Act: Task 07 > Print alphabe	t			٠.		 	 				٠.				٠.	12
Act: Task 08 > String length				٠.		 	 									13
Act: Task 09 > Print string .						 	 									14
Sharo																15



Engage

DESCRIPTION

Hey, wazzup?

You started to learn programming. That's nice! Let's go further. During this challenge, you will learn the basics of writing code in ${\tt C}$.

We invite you to start learning programming from C because:

- C is a great foundation for learning other programming languages
- C is built on basic programming concepts and it is very simple to understand how to develop programs using it
- When using C, you are always aware of how your program works under the hood. It
 doesn't hide anything from you. You've got the power
- And last but not least, coding on C in accordance with the Auditor will help you to develop a mindset of a true programmer

WELCOME TO C!

PLEASE, FOLLOW ME

BIG IDEA

Develop a programmer mindset.

ESSENTIAL QUESTION

What are the components of the simplest C program?

CHALLENGE

Learn the basics of C.



Investigate

GUIDING QUESTIONS

We invite you to find answers to the following questions. By researching and answering them, you will gain the knowledge necessary to complete the challenge. To find answers, ask the students and search the internet. We encourage you to ask as many questions as possible. Note down your findings and discuss them with your peers.

- · What do you remember the most from yesterday?
- How was your Sprint yesterday? How many tasks have you done?
- What topics were unclear to you?
- · What programming languages do you know? What do you know about them?
- · What do you know about the C language?
- . How to write "Hello World!" in C?

GUIDING ACTIVITIES

Complete the following activities. Don't forget that you have a limited time to overcome the challenge. Use it wisely. Distribute tasks correctly.

- Discuss the weather with the other students. What are their favorite cookies? What
 we really mean here is: create a friendly work environment to ensure comfortable
 cooperation and effective Peer-to-Peer.
- Repeat the basics from yesterday. Create and remove some test files only using Unixcommands.
- Open test files using Vim or Emacs. Write something. Google some hotkeys and commands for text editors that can increase your productivity.
- · Man unfamiliar words.
- Watch some C tutorials on YouTube. Type "learn c" in the search bar.
- Open Terminal . Create and open a new file hello_world.c using Vim or Emacs .
- · Write a "Hello world" program using the printf function. Save the file.
- Compile this file as follows
 clang -std=c11 -Wall -Wextra -Werror -Wpedantic hello_world.c -o hello_world.
- Run your program with ./hello_world.
- Try to write the same program using the write function instead of printf .
- Auditor is a style guide for C. You can find the pdf of the Auditor here or in LMS->Media. Keep in mind that you must follow the Auditor rules for all the code you write in C.
- Clone your git repository that is issued on the challenge page in the LMS.
 Use git clone for this.
- You are ready to do the t00.
- · Communicate with students and share information.



ANALYSIS

Analyze your findings. What conclusions have you made after completing guiding questions and activities? In addition to your thoughts and conclusions, here are some more analysis results.

- Be attentive to all statements of the story. Examine the given examples carefully. They may contain details that are not mentioned in the task.
- · Analyze all information you have collected during the preparation stages.
- · Perform only those tasks that are given in this document.
- Submit your files using the layout described in the story. Only useful files allowed, garbage shall not pass!
- Compile C-files with clang compiler and use these flags: clang -std=c11 -Wall -Wextra -Werror -Wpedantic.
- Pay attention to what is allowed in a certain task. Use of forbidden stuff is considered
 a cheat and your tasks will be failed.
- Complete tasks according to the rules specified in the Auditor .
- The solution will be checked and graded by students like you. Peer-to-Peer learning.
- Also, the challenge will pass automatic evaluation which is called Oracle.
- If you have any questions or don't understand something, ask other students or just Google it.
- Use your brain and follow the white rabbit to prove that you are the Chosen one!





NAME

Hello world

DIRECTORY

±00/

SUBMIT

main.c

ALLOWED FUNCTIONS

printf

DESCRIPTION

Create a program that outputs the text below to standard output followed by a newline.

CONSOLE OUTPUT

```
>clang -std=cii -Wall -Wextra -Werror -Wpedantic -o hello_world main.c
>./hello_world | cat -e
Hello World$
>
```

FOLLOW THE WHITE PARRIT

man 3 printf





NAME

Say wake up

DIRECTORY

t01/

CHRMIT

mx_say_wake_up.c

ALLOWED FUNCTIONS

printf

DESCRIPTION

Create a function that outputs the text below to standard output followed by a newline.

SYNOPSIS

void mx_say_wake_up(void);

CONSOLE OUTPUT

```
>./mx_say_wake_up | cat -e
Wake up, NEO \ (^_^) / ...$
The Matrix has you ...$
>
```

FOLLOW THE WHITE RABBIT

man 3 printf





NAME

Write knock, knock

DIRECTORY

±02/

SURMIT

mx_write_knock_knock.c

ALLOWED FUNCTIONS

write, strler

DESCRIPTION

Create a function that outputs the text below to standard output followed by a newline.

SYNOPSIS

void mx_write_knock_knock(void);

CONSOLE OUTPUT

```
>./mx_write_knock_knock | cat -e
Follow the white rabbit.$
Knock, knock, Neo.$
>
```

FOLLOW THE WHITE PARRIT

man 2 write man strlen





NAME

Matrix voice

DIRECTORY

t03/

SUBMIT

mx_matrix_voice.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs the smallest unit of matrix voice - beep (sound signal).

SYNOPSIS

void mx_matrix_voice(void);

CONSOLE OUTPUT

```
>./mx_matrix_voice | cat -e
^G%
>
```

FOLLOW THE WHITE RABBIT

man 2 write man ascii

SEE ALSO

Matrix voice





NAME

Print character

DIRECTORY

t04/

SUBMIT

mx_printchar.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs a single character to standard output.

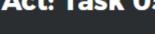
SYNOPSIS

void mx_printchar(char c);

FOLLOW THE WHITE RABBIT

man 2 write man ascii





NAME

Only printable

DIRECTORY

t05/

SUBMIT

mx_only_printable.c, mx_printchar.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs all printable characters in reverse order to standard output followed by a newline.

Hint: Space is a printable character.

SYNOPSIS

void mx_only_printable(void);

FOLLOW THE WHITE RABBIT

man ascii





NAME

Hexadecimal

DIRECTORY

t06/

SUBMIT

mx_hexadecimal.c, mx_printchar.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs characters representing hexadecimal numerals in ascending order to standard output followed by a newline. Characters must be in uppercase.

SYNOPSIS

void mx_hexadecimal(void);

EXAMPLE

void mx_hexadecimal(void); //prints 0...F ; there must be all characters instead of ...

FOLLOW THE WHITE DARRIT

man ascii





NAME

Print alphabet

DIRECTORY

t07/

SUBMIT

mx_print_alphabet.c, mx_printchar.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs the alphabet, alternating upper and lower case characters in ascending order to standard output followed by a newline. See the output in the EXAMPLE below.

SYNOPSIS

void mx_print_alphabet(void);

EXAMPLE

mx_print_alphabet(); //prints AbC...; there must be full alphabet instead of ...

FOLLOW THE WHITE DARRIT

man ascii





NAME

String length

DIRECTORY

t08/

SUBMIT

mx_strlen.c

ALLOWED FUNCTIONS

None

DESCRIPTION

Create a function that has the same behaviour as the corresponding standard libc function strlen .

SYNOPSIS

int mx_strlen(const char *s);

FOLLOW THE WHITE PARRIT

man 3 strlen





NAME

Print string

DIRECTORY

t09/

SUBMIT

mx_printstr.c, mx_strlen.c

ALLOWED FUNCTIONS

write

DESCRIPTION

Create a function that outputs a string of characters to standard output.

SYNOPSIS

void mx_printstr(const char *s);

FOLLOW THE WHITE RABBIT

man 2 write

