Sprint 00

Marathon C

October 16, 2019

ucode

Contents

Engage

DESCRIPTION

Hey here.

You code world, and it's time to prove it. During this month, you will overcome challenges every day. With each challenge you overcome, you will gain skills that will be useful to you for life in any situation and under any circumstances.

During Marathon C, you will get a strong base of Computer Science. It will be a hard month, which will make you better. After it, you will be able to boldly and easily proceed to the following challenges, technologies and programming languages.

It's time to begin, isn't it? There is no time for extra words.

And remember, that education isn't a preparation for a future life.
Education is a process of life.

BIG IDEA

Find your way to success.

ESSENTIAL QUESTION

How to effectively use all the components of the educational system to get as much experience as possible?

CHALLENGE

Start learning programming.

Investigate

GUIDING QUESTIONS

We invite you to find answers to the following questions. This will help you realize why you are here and what you want to get from it. And most importantly, how to move forward.

Ask your neighbor on the right, left, or behind you, and discuss the following questions together. You can walk around the campus and find yourself a comfortable place to do it.

We encourage you to ask as many personal and contextual questions as possible. Note down your discussion.

- What is your name, how old are you, what do you do in life?
- How did you find out about ucode?
- Why did you apply?
- Why are you interested in learning programming?
- What is your background?
- What are you going to do after you complete the ucode?
- What do you know about programming?
- What ideas can be implemented using programming?
- What product would you like to create using acquired skills?
- What skills do you want to get?
- What do you need to start learning?
- Are you ready to start?

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. To get started, prepare a workspace. You will use this account during the entire marathon. Therefore, make it so that you are comfortable to use it. Understand the OS. Add the languages you need.
2. Explore the campus. Walk across all locations. Find out the working room of your campus, kitchen, game room, creative and presentation space, and, especially, where is shower :)
3. Prepare a work chair, select the desired angle of the backrest. Select the desired music. Will it be rock or classic? ..or even rap? However, it does not matter. Because you will need to constantly ask questions to your neighbors and friends. Therefore, proceed to the next step.
4. Prepare your account in Slack. Enter the correct data. Add an avatar to get to know you better. Write a greeting to the `#general`.
5. Ask students who have already started what you need to figure out. Download the necessary software. Prepare your mind for an explosion.
6. Read the book `ftp://ftp.oeaw.ac.at/pc/e-books/linux/learn_unix.pdf`.

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 this story below.
- You should submit only the specified files in the required directory and nothing else. Garbage shall not pass.
- Tasks which require to write commands must be executed in the `Terminal` with `zsh`.
- Usage of forbidden functions is considered as cheat and your challenge will be failed.
- Your exercises will be checked and graded by students.
- Your exercises will pass automatic evaluation which is called `Oracle`.
- Got a question or you do not 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!!!

Act

SOLUTION DEVELOPMENT

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

1. Open a `Terminal` utility on your Mac. You will start learning from the basics of UNIX systems. Type `vim`. You will open a text editor Vim. Now try out of it, without closing the entire terminal. If you do not know how to do this - google `how to exit vim`. Now type `emacs`. Understand what to do with it. Good luck with that :)
2. You can find out what is `vim` or `emacs` directly in Terminal. Just type `man vim` and you will find out what vim is. Type Same with emacs. Press `Q` to quit from man.
3. Clone your git repository, what is issued on the challenge page in the LMS. Use `git clone` for this. Magic! Isn't it?
4. Go to the following tasks below.

Task 00

NAME

Man

DIRECTORY

`t00/`

SUBMIT

`man.sh`

DESCRIPTION

Create a script that will display `man` manual.
You should push that script to `t00` directory at your git repository.

If you are smart, you may use `vim` or `emacs`.

FOLLOW THE WHITE RABBIT

```
man mkdir
man touch
man emacs
man vim
```

Task 01

NAME

Git

DIRECTORY

`t01/`

SUBMIT

`push_me.txt`

DESCRIPTION

Create a `txt` file containing 3 `git` commands that you will use to commit and push `Task 00` to your repository:

- add changes staged for the next commit;
- commit changes with descriptive commit message;
- push commited changes to remote repository.

Each git command must be followed by the newline.

CONSOLE OUTPUT

```
>cat -e push_me.txt
git command1$
git command2$
git command3$
```

FOLLOW THE WHITE RABBIT

man git
man git-add
man git-commit
man git-push

SEE ALSO

Git user manual
Gitflows

Task 02

NAME

Set me on file

DIRECTORY

`t02/`

SUBMIT

`set_me_on_file.sh`

DESCRIPTION

Create a script that will:

- create a file called `fire`;
- set permissions and last-modified date for the created `fire` file, exactly like in the CONSOLE OUTPUT section.

CONSOLE OUTPUT

```
>zsh set_me_on_file.sh
>ls -laT
total 8
drwxr-xr-x   4 xlogin  users  128 Jan  3 13:42:37 2019 .
drwxr-xr-x  19 xlogin  users  608 Jan  3 13:42:02 2019 ..
-r--------   1 xlogin  users    0 Aug 24 00:00:00 1991 fire
-rw-r--r--   1 xlogin  users   31 Jan  3 13:42:37 2019 set_me_on_file.sh
```

FOLLOW THE WHITE RABBIT

man chmod
man ls

Task 03

NAME

Knock knock . . .

DIRECTORY

`t03/`

SUBMIT

`wake_up.sh`

DESCRIPTION

Create a script that will:

- create a file `instructions.txt` ;
- write `Follow the white rabbit.` followed by the newline to `instructions.txt` .

CONSOLE OUTPUT

```
>zsh wake_up.sh
>cat -e instructions.txt
Follow the white rabbit.$
>
```

Task 04

NAME

Kerberos

DIRECTORY

`t04/`

SUBMIT

`kerberos.txt`

DESCRIPTION

Create a file `kerberos.txt` containing 3 commands:

- displays the current tickets in the credential cache;
- authenticates yourself to the Kerberos server as principal on any computer;
- removes all credential caches.

Each command must be followed by the newline.

FOLLOW THE WHITE RABBIT

```
man kerberos
man kdestroy
man klist
man kinit
```

SEE ALSO

Kerberos

Task 05

NAME

Find Neo

DIRECTORY

`t05/`

SUBMIT

`find_chosen.sh`

DESCRIPTION

Create a script that will:

- take file as argument. File contains Matrix characters formatted as in the CONSOLE OUTPUT section;
- show only `redpill` entities from file.

CONSOLE OUTPUT

```
>cat -e characters
Agent #0 strength:8 power:5$
Agent #1 strength:5 power:5$
Redpill Anderson strength:6 power:8$
Agent #2 strength:3 power:6$
redpill Dozer strength:2 power:4$
>zsh find_chosen.sh characters | cat -e
Redpill Anderson strength:6 power:8$
redpill Dozer strength:2 power:4$
>
```

Task 06

NAME

Commit history

DIRECTORY

`t06/`

SUBMIT

`git_log.sh`

DESCRIPTION

Create a script that will:

- show abbreviated commit hash and subject separated by a space of 3 last commits.

Create more than 3 commits in `sprint00` repository thus the assessor will be able to check script correctness during defence.
Every commit must be followed by the newline.

CONSOLE OUTPUT

```
>zsh git_log.sh > git_history.txt
>cat -e git_history.txt
f61fde9 t05 find chosen$
50ab5e5 t04 kerberos$
dcf793c t03 wake up$
>
```

FOLLOW THE WHITE RABBIT

```
man git-log
man git
```

Task 07

NAME

Ignore them all

DIRECTORY

`t07/`

SUBMIT

`.gitignore`

DESCRIPTION

Create a `.gitignore` for next files:

- .DS_Store
- ._.DS_Store
- *.o
- *.out

If you are smart enough use it in your challenge repository.

CONSOLE OUTPUT

```
>touch .DS_Store && touch kek.o
>git ls-files --ignored --exclude-standard --others | cat -e
.DS_Store$
kek.o$
>
```

Task 08

NAME

List directory contents

DIRECTORY

`t08/`

SUBMIT

`ls.sh`

DESCRIPTION

Create a script that will:

- take file/directory as argument;
- show all files/directories inside given directory except of `.` and `..`;
- display their sizes separated by a single space;
- sort by file/directory name.

CONSOLE OUTPUT

```
>zsh ls.sh . | cat -e
ls.sh 51B$
>zsh ls.sh /bin | cat -e
bash 604K$
cat 23K$
chmod 33K$
cp 28K$
csh 371K$
date 28K$
...
zsh 596K$
>
```

Task 09

NAME

File difference

DIRECTORY

`t09/`

SUBMIT

`diff.sh`

DESCRIPTION

Create a script that will:

- take three files as arguments;
- find a difference between two files;
- write their `difference` to the third file.

CONSOLE OUTPUT

```
>zsh diff.sh t09_1.txt t09_2.txt difference.txt
>cat -e difference.txt
6c6$
< <string>YES</string>$
---$
> <string>NO</string>$
18c18$
< <string>59</string>$
---$
> <string>69</string>$
28c28$
< <string>44</string>$
---$
> <string>46</string>$
>
```

Task 10

NAME

Download

DIRECTORY

`t10/`

SUBMIT

`download.sh`

DESCRIPTION

Create a script that will:

- take `url` and `filename` as first and second arguments respectively;
- download image from the url and save it to the file with a given filename.

CONSOLE OUTPUT

```
>zsh download.sh https://lms.ucode.world/api/media/protocol_resources/sprint00/p4ujh.jpg image.jpg
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  161k  100  161k    0     0  89933      0  0:00:01  0:00:01 --:--:-- 89961
>open image.jpg
>
```

FOLLOW THE WHITE RABBIT

```
man curl
man open
```

Task 11

NAME

Pipe

DIRECTORY

`t11/`

SUBMIT

`pipe.sh`

DESCRIPTION

Create a script that will:

- take file as argument. File contains Matrix characters formatted as in the CONSOLE OUTPUT section;
- show only `redpill` entities from file changed into `bluepill` ;
- contain only one-line instruction.

CONSOLE OUTPUT

```
>cat -e characters
Agent #0 strength:8 power:5$
Agent #1 strength:5 power:5$
Redpill Anderson strength:6 power:8$
Agent #2 strength:3 power:6$
redpill Dozer strength:2 power:4$
>zsh pipe.sh characters | cat -e
bluepill Anderson strength:6 power:8$
bluepill Dozer strength:2 power:4$
>
```

SEE ALSO

Pipelines

Task 12

NAME

Tar me

DIRECTORY

`t12/`

SUBMIT

`tar.sh`

DESCRIPTION

Create a script that will:

- create new archive with the given archive name and file/directory set `tar.sh [-c] [name.tar] [file ...]` ;
- extract files from the given archive `tar.sh [-e] [name.tar]` .

CONSOLE OUTPUT

```
>ls
dir1   dir2   file1  file2  tar.sh
>zsh tar.sh -c arch.tar dir1 dir2 file1 file2
>ls
arch.tar dir1     dir2     file1    file2    tar.sh
>rm -df dir1 dir2 file1 file2
>ls
arch.tar tar.sh
>zsh tar.sh -e arch.tar
>ls
arch.tar dir1     dir2     file1    file2    tar.sh
>
```

FOLLOW THE WHITE RABBIT

`man tar`

Task 13

NAME

Alias

DIRECTORY

`t13/`

SUBMIT

`alias.sh`

DESCRIPTION

Create a script `alias.sh` that will take a filename as command-line argument and write in this file aliases listed below:

- `ga` for `git add` command;
- `gcmsg` for `git commit -m` command;
- `gp` for `git push` command.

Find out how to put these aliases to work in your terminal permanently to use during entire Marathon C.

CONSOLE OUTPUT

```
>ls
alias.sh
>ga
zsh: command not found: ga
>zsh alias.sh source_me
>ls
alias.sh  source_me
>source source_me
>ga
Nothing specified, nothing added.
Maybe you wanted to say 'git add .'?
>gcmsg
error: switch `m' requires a value
>
```

SEE ALSO

https://shapeshed.com/unix-alias/

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.