

C Piscine C 05

Summary: this document is the subject for the C 05 module of the C Piscine @ 42.

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Chapter I

Instructions

- Only this page will serve as reference: do not trust rumors.
- Watch out! This document could potentially change before submission.
- Make sure you have the appropriate permissions on your files and directories.
- You have to follow the submission procedures for all your exercises.
- Your exercises will be chea G/i4s2ti1o7(elraded)-326(wi326(as)-327(on)-326(y)27feto)-326(folltia

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- Your reference guide is called Google / man / the Internet /
- Check out the "C Piscine" part of the forum on the intranet, or the slack Piscine.
- Examine the examples thoroughly. They could very well call for details that are not explicitly mentioned in the subject...
- By Odin, by Thor! Use your brain!!!



Norminette must be launched with the -R CheckForbiddenSourceHeader flag. Moulinette will use it too.

Chapter II

Foreword

Here are some lyrics extract from the Harry Potter saga:

Oh you may not think me pretty, But don't judge on what you see, I'll eat myself if you can find A smarter hat than me.

Your top hats sleek and tall, For I'm the Hogwarts Sorting Hat And I can cap them all.

The Sorting Hat, stored in the Headmaster's Office. There's nothing hidden in your head The Sorting Hat can't see, So try me on and I will tell you Where you ought to be.

You might belong in Gryffindor, Where dwell the brave at heart, Their daring, nerve, and chivalry Set Gryffindors apart;

You might belong in Hufflepuff, Where they are just and loyal, Those patient Hufflepuffs are true And unafraid of toil;

Or yet in wise old Ravenclaw, If you've a ready mind, Where those of wit and learning, Will always find their kind;

Or perhaps in Slytherin You'll make your real friends, Those cunning folks use any means C Piscine C 05

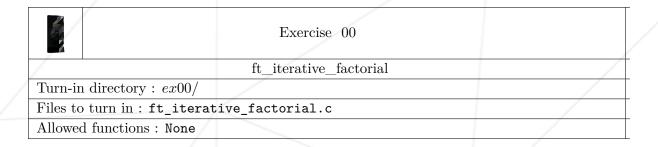
To achieve their ends.

So put me on! Don't be afraid! And don't get in a flap! You're in safe hands (though I have none) For I'm a Thinking Cap!

Unfortunately, this subject's got nothing to do with the Harry Potter saga, which is too bad, because your exercises won't be done by magic.

Chapter III

Exercise 00: ft_iterative_factorial

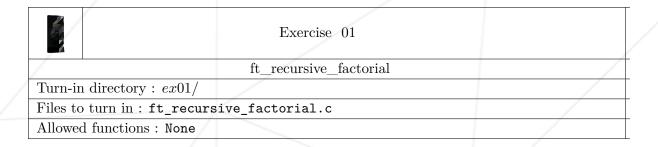


- Create an iterated function that returns a number. This number is the result of a factorial operation based on the number given as a parameter.
- If the argument is not valid the function should return 0.
- Overflows must not be handled, the function return will be undefined.
- Here's how it should be prototyped :

int ft_iterative_factorial(int nb);

Chapter IV

Exercise 01: ft_recursive_factorial

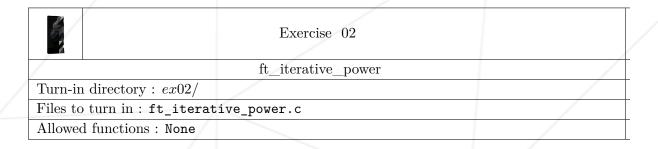


- Create a recursive function that returns the factorial of the number given as a parameter.
- If the argument is not valid the function should return 0.
- Overflows must not be handled, the function return will be undefined.
- Here's how it should be prototyped :

int ft_recursive_factorial(int nb);

Chapter V

Exercise 02: ft_iterative_power

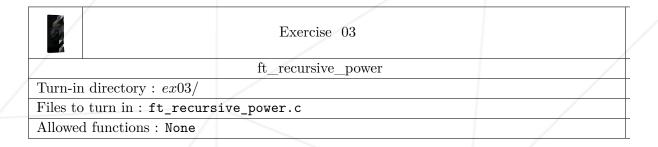


- Create an iterated function that returns the value of a power applied to a number. An power lower than 0 returns 0. Overflows must not be handled.
- We've decided that 0 power 0 will returns 1
- Here's how it should be prototyped :

int ft_iterative_power(int nb, int power);

Chapter VI

Exercise 03: ft_recursive_power

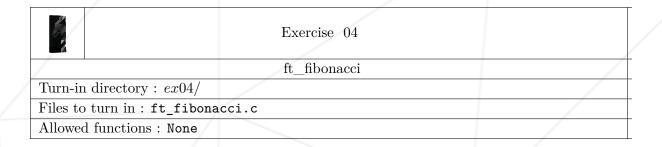


- Create a recursive function that returns the value of a power applied to a number.
- Overflows must not be handled, the function return will be undefined.
- We've decided that 0 power 0 will returns 1
- Here's how it should be prototyped :

int ft_recursive_power(int nb, int power);

Chapter VII

Exercise 04: ft_fibonacci



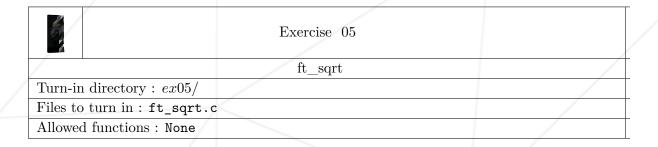
- Create a function ft_fibonacci that returns the n-th element of the Fibonacci sequence, the first element being at the 0 index. We'll consider that the Fibonacci sequence starts like this: 0, 1, 1, 2.
- Overflows must not be handled, the function return will be undefined.
- Here's how it should be prototyped :

int ft_fibonacci(int index);

- Obviously, ft fibonacci has to be recursive.
- If the index is less than 0, the function should return -1.

Chapter VIII

Exercise 05: ft_sqrt

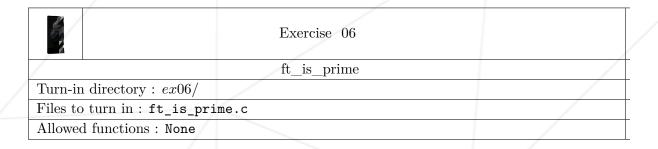


- Create a function that returns the square root of a number (if it exists), or 0 if the square root is an irrational number.
- Here's how it should be prototyped :

int ft_sqrt(int nb);

Chapter IX

Exercise 06: ft_is_prime



- Create a function that returns 1 if the number given as a parameter is a prime number, and 0 if it isn't.
- Here's how it should be prototyped :

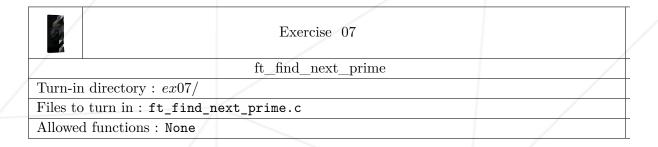
int ft_is_prime(int nb);



0 and 1 are not prime numbers.

Chapter X

Exercise 07: ft_find_next_prime

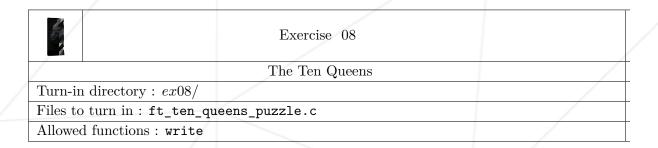


- Create a function that returns the next prime number greater or equal to the number given as argument.
- Here's how it should be prototyped :

int ft_find_next_prime(int nb);

Chapter XI

Exercise 08: The Ten Queens



- Create a function that displays all possible placements of the ten queens on a chessboard which would contain ten columns and ten lines, without them being able to reach each other in a single move, and returns the number of possibilities.
- Recursivity is required to solve this problem.
- Here's how it should be prototyped :

```
int ft_ten_queens_puzzle(void);
```

• Here's how it'll be displayed :

```
$>./a.out | cat -e
0257948136$
0258693147$
...
4605713829$
4609582731$
...
9742051863$
$>
```

- The sequence goes from left to right. The first digit represents the first Queen's position in the first column (the index starting from 0). The Nth digit represents the Nth Queen's position in the Nth column.
- The return value must be the total number of displayed solutions.