Prime Numbers ✔✔✔ ☺

This assignment **closed** October 27, 2024 at 23:15.

Prime Numbers

A number $n \in \mathbb{N}, n > 1$ is called prime if it has exactly two factors: 1 and itself.

1. Write a function `is_prime(n: int) -> bool` that takes an integer `n` and returns `True` if and only if `n` is prime.
2. Write a function `next_prime(n: int) -> int` that returns the next prime number p that is larger than or equal to n, i.e. if n is prime, return n, otherwise return the next larger prime number.
3. Within the main function give suitable test cases for your functions.

Hint:

- This assignment is tested automatically. For the tests to work you ***must not*** change the signature of the functions nor the modifiers!

Template files

Get all files in an archive templates.zip or templates.tgz .

`prime_numbers.py`

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Median ✔✔✔ ☺

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Median

Task 1

Write a Python method `median(a: int, b: int, c: int) -> int`, that calculates the median of the three given numbers (it has to be one of those numbers!).
Example: `median(25, 11, 33) == 25` and `median(1, 1, 2) == 1`

Task 2

Now do the same again, but think of an alternative to your first solution. Write a Python method `median2(a: int, b: int, c: int) -> int`.

Task 3

How would you test if your functions work properly? Give some tests within your script. These will be discussed during the exercise.

Template files

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`median_of_three.py`

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Transform Numbers ✔✔✔ ☺

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Transformation of Decimal and Dual Numbers

1. Write a Python method `transform_to_dual(dec: int) -> str` that transforms a number $n > 0$ given in base10 to the String representation of that same number in base2. *Be aware of the order of bits!*
2. Test your method appropriately.

Example: `transform_to_dual(13) == "1101"`.

Note:

- To solve this task **do not** use any library function such as `"{0:b}".format(x)`. You may however use that function to validate your results.
- To create the output `String` you can concatenate two `String`s by using the `+` operator.

```
output: str = ""
...
output = output + "1"  # Append 1 to the end of the string
output = "1" + output  # Append 1 to the front of the string
```

Template files

Get all files in an archive templates.zip or templates.tgz.

decimal_to_dual.py

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Error Message

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Error Message

Compiler and Interpreters generate *warnings* and *errors*.

Download the given scripts and invoke the Python interpreter on each one. Alternatively let your IDE describe the error for you. **Describe** the error messages you see (What causes the error or warnung? What is the name of the error? …) and fix the script.

Bonus: Provide a Python error message you got in another course/one of your own projects/… and the solution for the problem.

Template files

Get all files in an archive templates.zip or templates.tgz .

- error_message.md
- script_1.py
- script_2.py
- script_3.py
- script_4.py
- script_5.py
- script_6.py
- script_7.py

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