UPU, Freshman campus


The freshman year is getting to an end.


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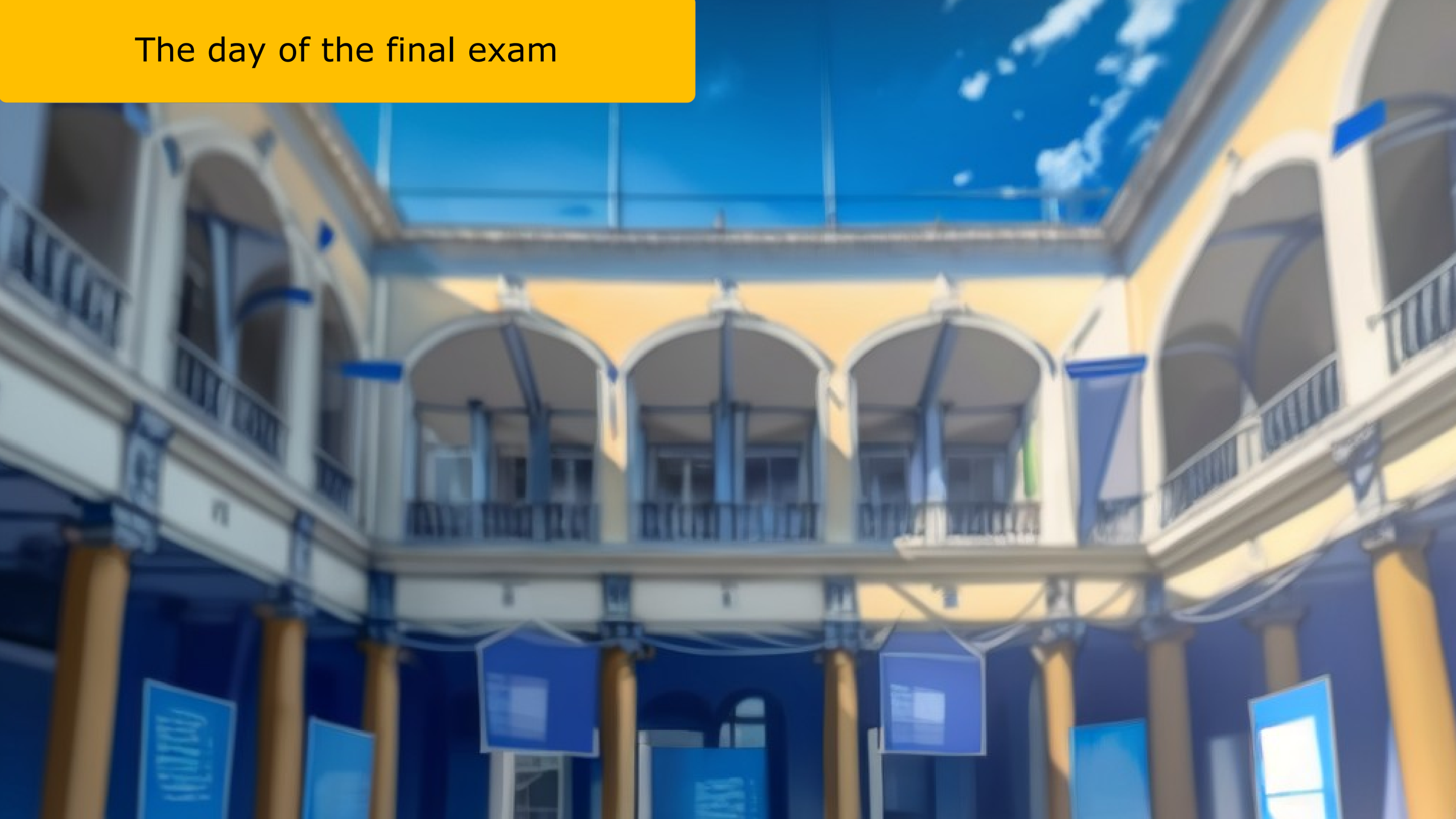
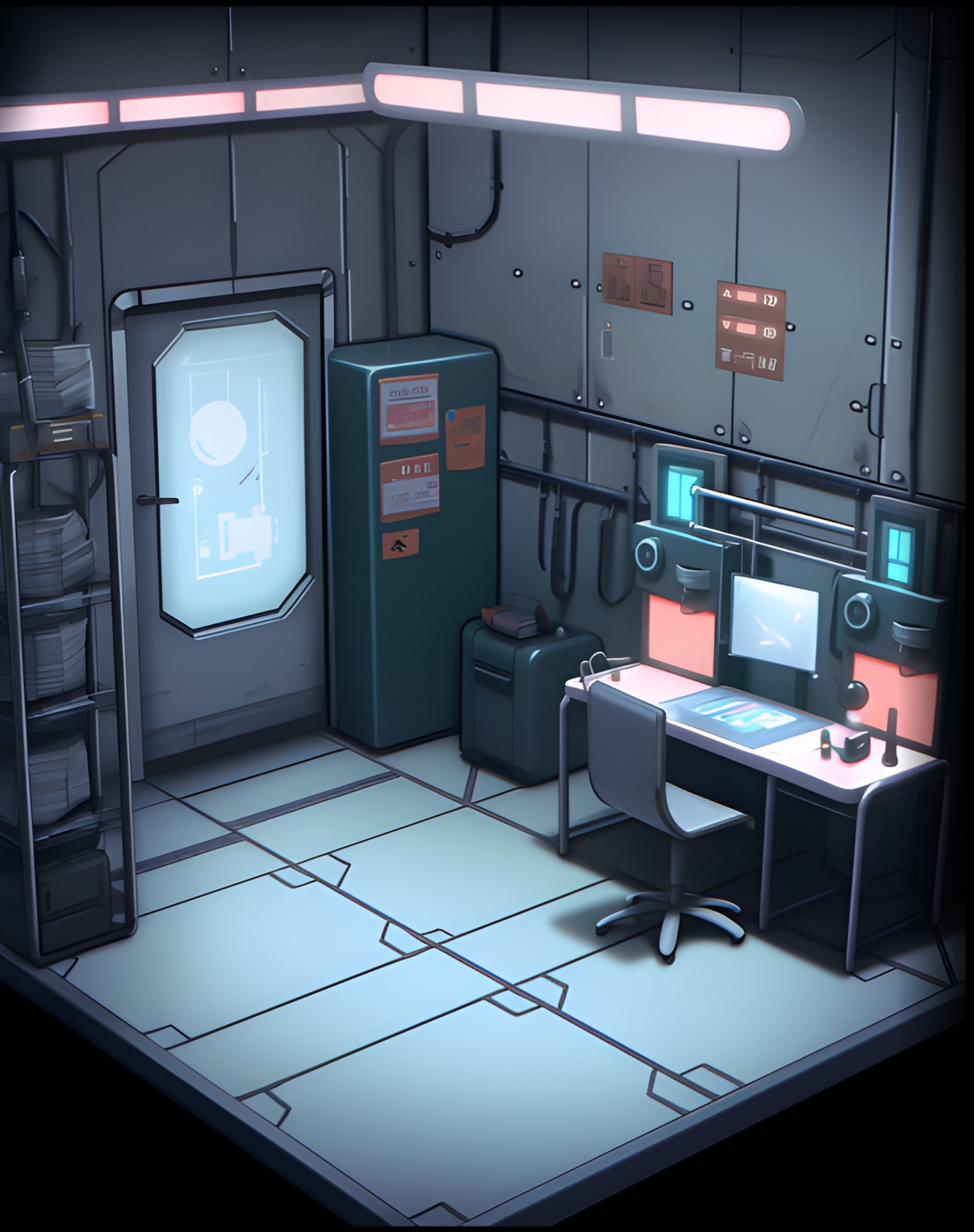
Today is the day!

The day of the final exam





The final exam starts at 9am.

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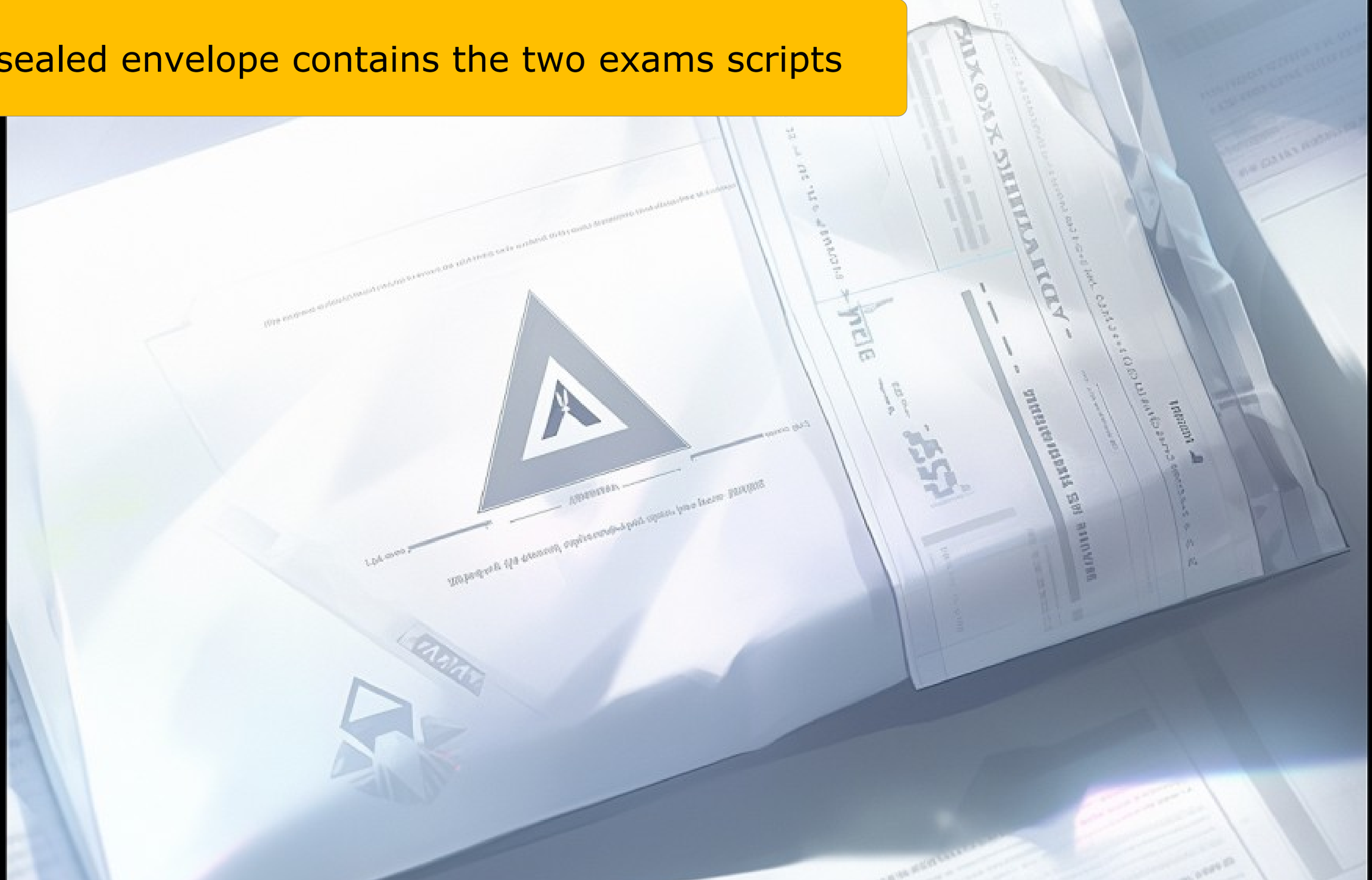
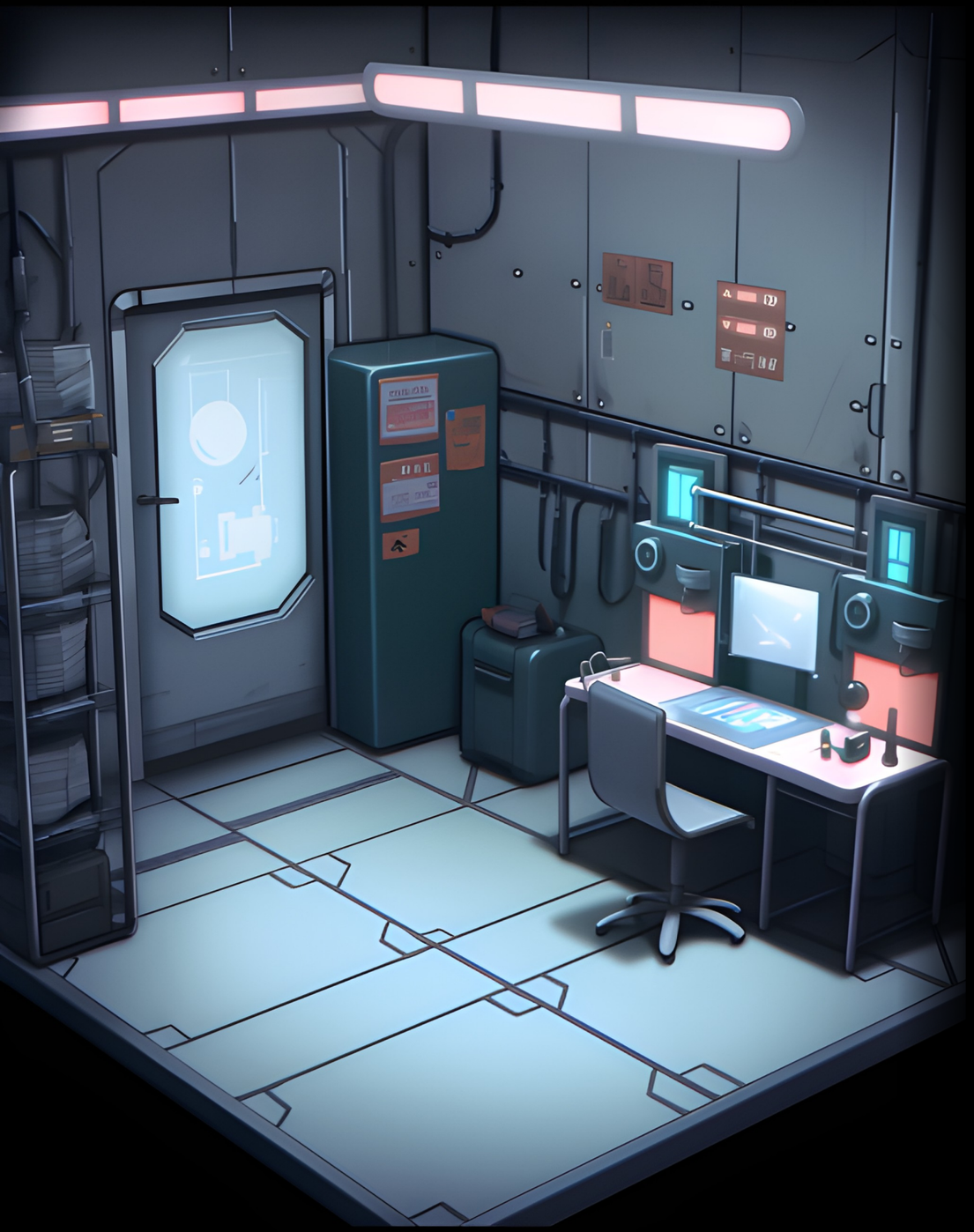
The exam is held in sealed
individual room and it lasts 5 hours.

A sealed envelope contains the two exams scripts





Dany just entered in the room

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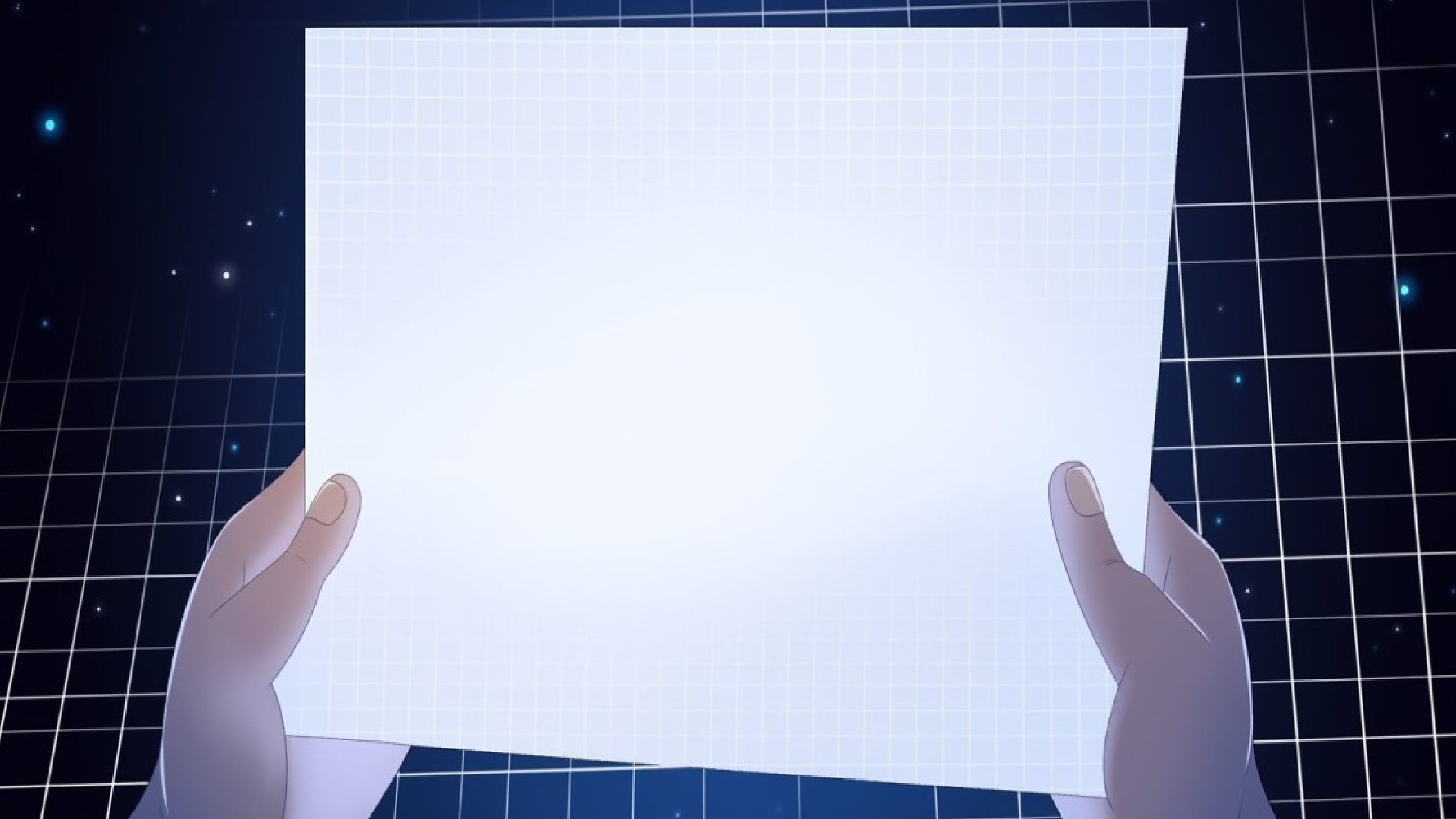

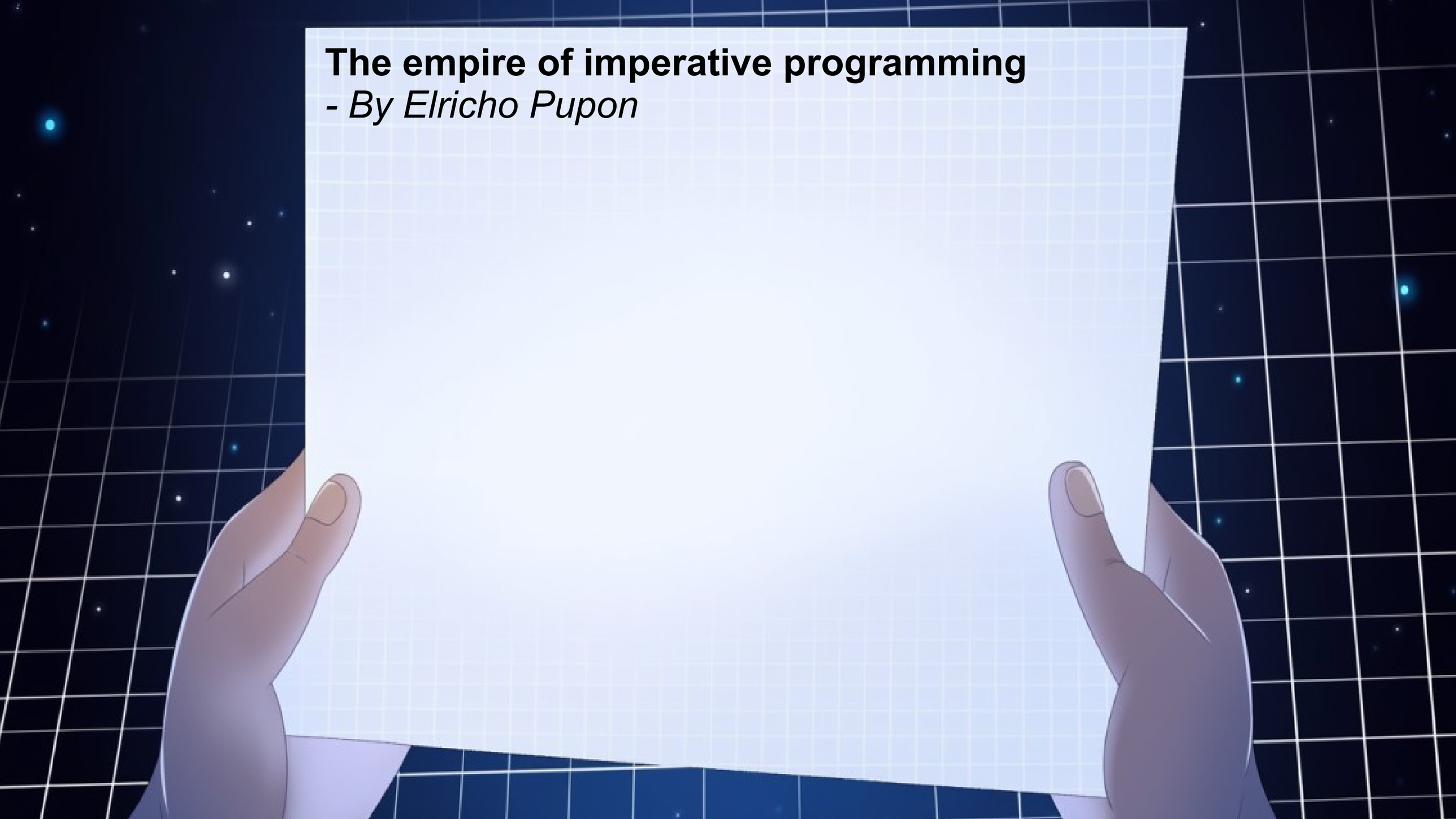
The empire of imperative programming
- By Elricho Pupon

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Implement an efficient and elegant merge sort algorithm in Java.
Details: the algorithm must take in input a list of an appropriate type T, and must produce a sorted version of that list, without modifying the original.

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Implement an efficient and elegant merge sort algorithm in Java.
Details: the algorithm must take in input a list of an appropriate type T, and must produce a sorted version of that list, without modifying the original.

The algorithm should run in O(n*logn), and allocate no more then O(n) space.
It should rely on high level abstractions instead of indexes.

Merge sort! Yes, I remember it!
It is about dividing a list in half,
over and over again.

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Eventually, the list parts become singleton lists:
lists with just one element.

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Eventually, the list parts become singleton lists:
lists with just one element.

And a list with a single element
is intrinsically sorted!

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It is about dividing a list in half,
over and over again.

Eventually, the list parts become singleton lists:
lists with just one element.

And a list with a single element
is intrinsically sorted!

It is about dividing your problems into smaller
and smaller problems until they disappear!


A giant list is
a giant problem to solve


A giant list is
a giant problem to solve
An overwhelming
problem!


If we can somehow
divide the problem in two


If we can somehow divide the problem in two
We would have two smaller disasters!


If we can somehow divide the problem in two
We would have two smaller disasters!
We can then attack them one at the time, and recover between them


If the two new problems are still too big to attack directly


If the two new problems are still too big to attack directly
We can just recursively divide them over and over again






They still look menacing

They still look menacing

We can divide them more!

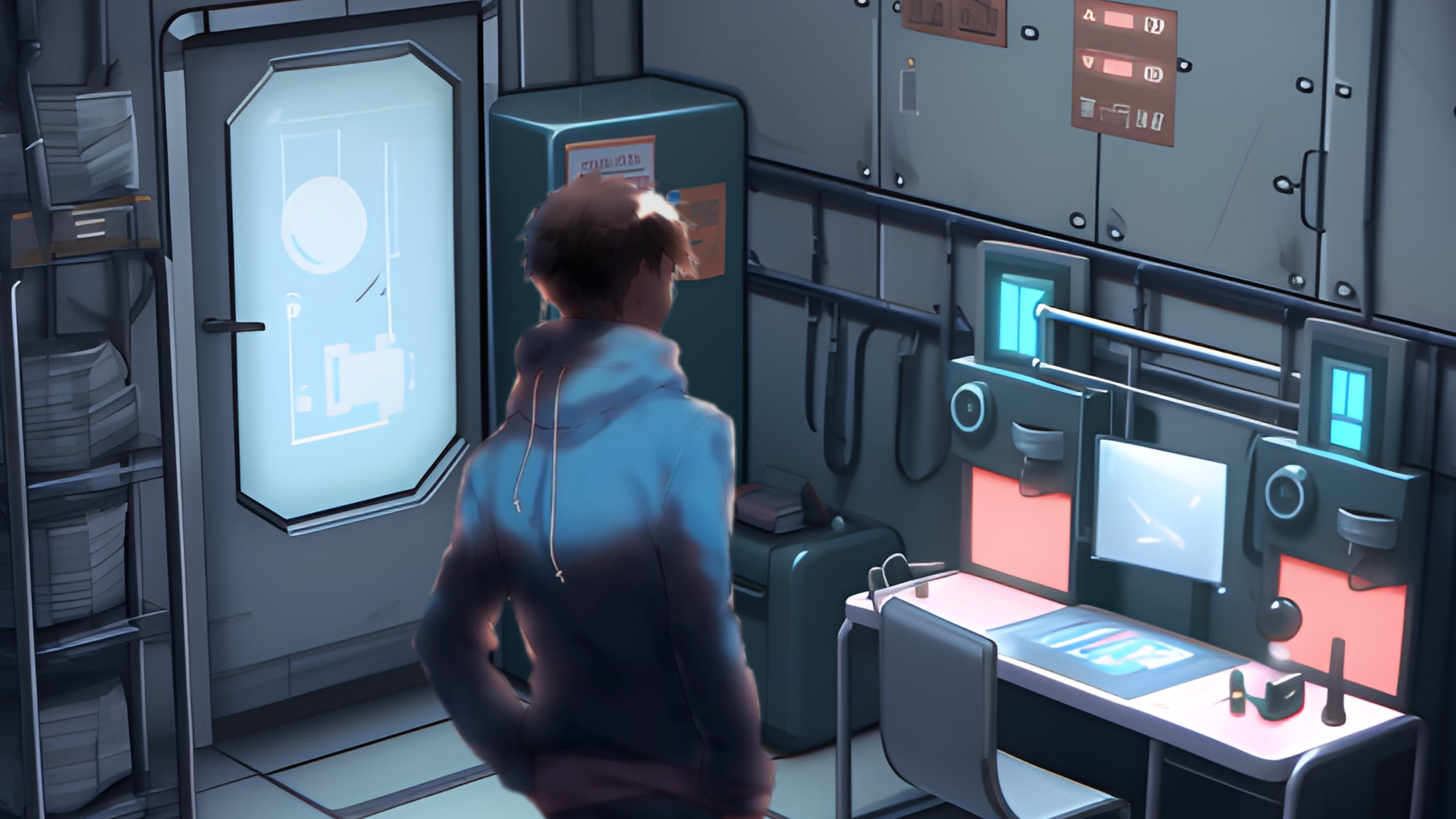


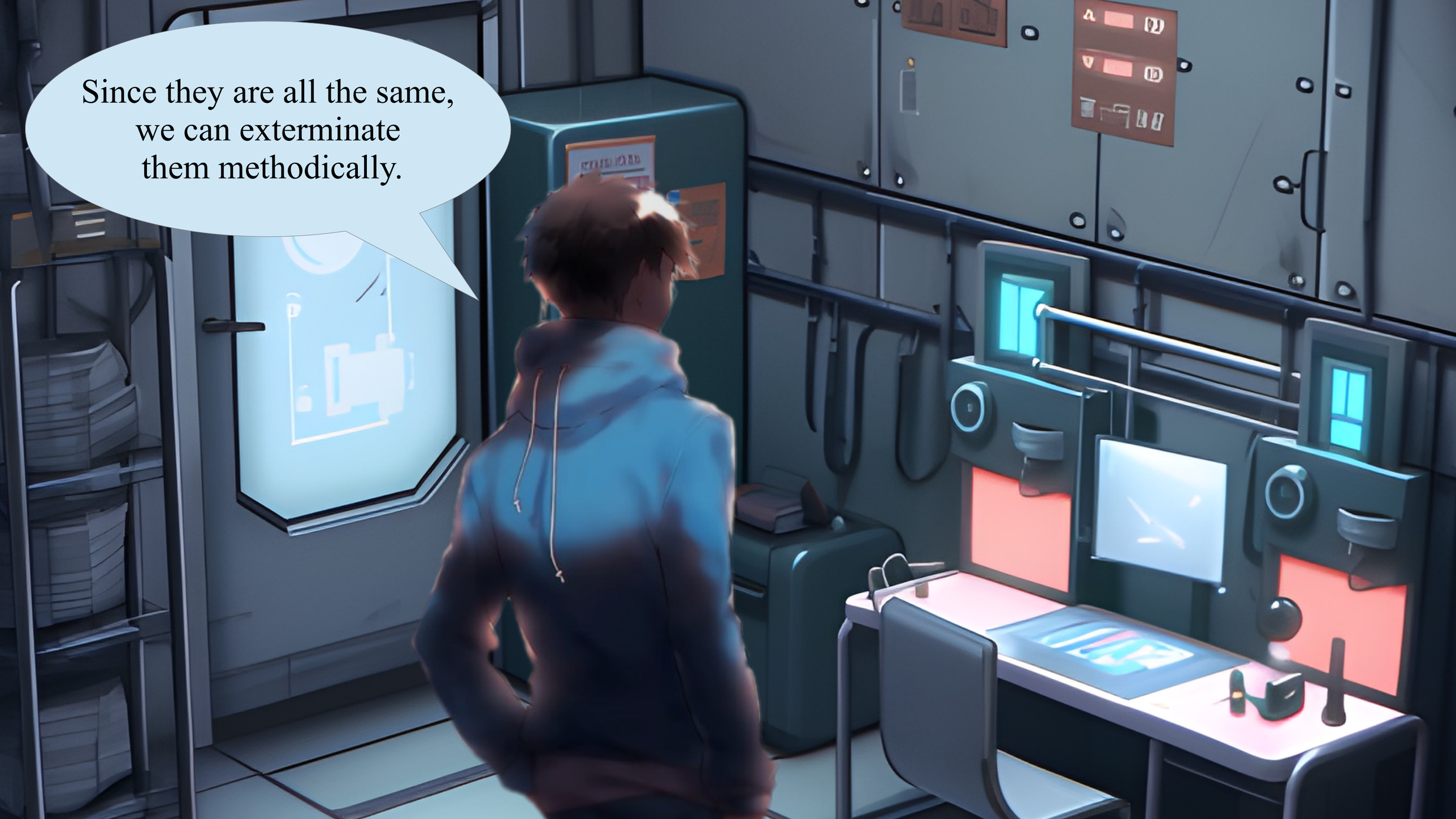


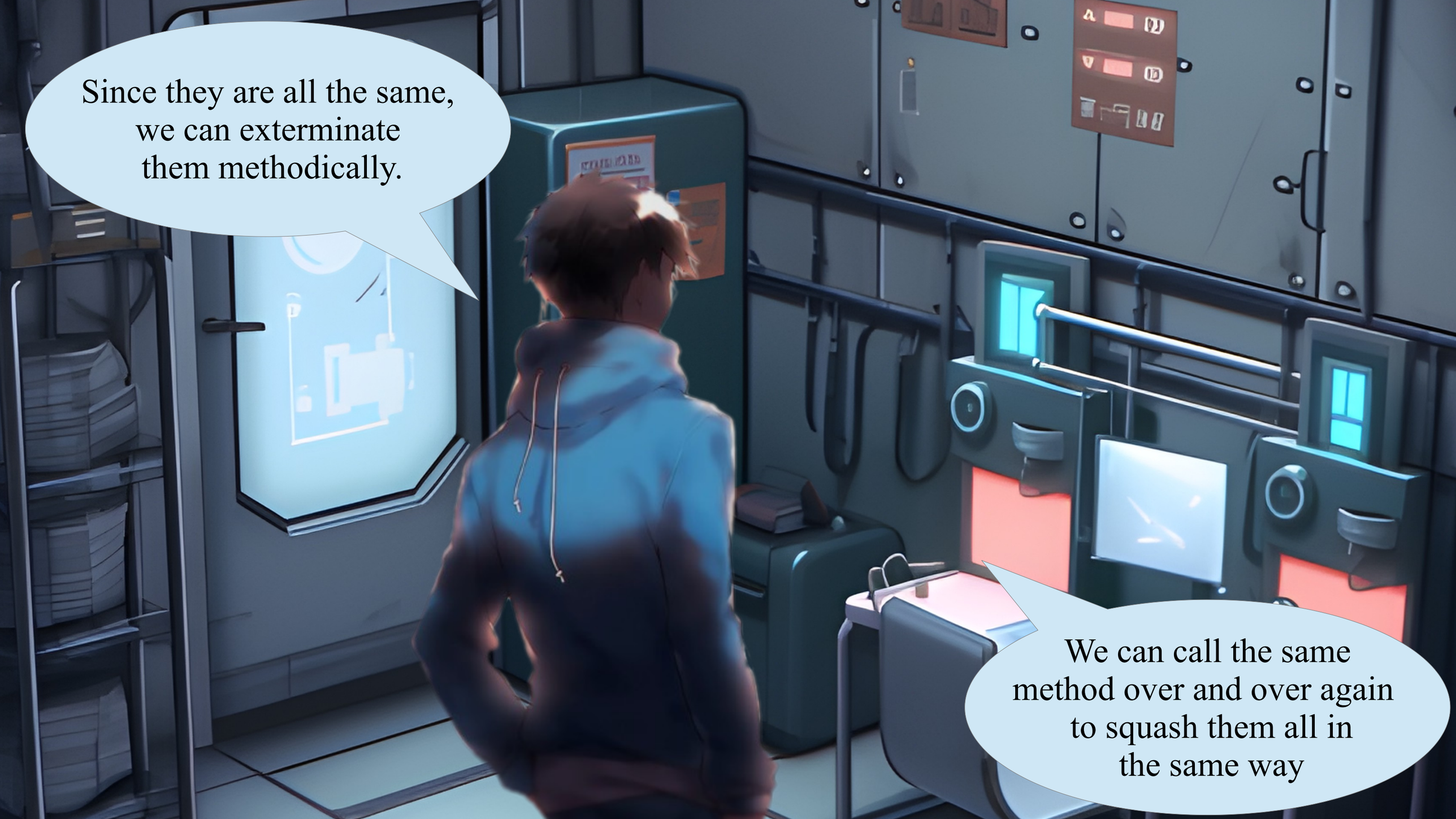

Now they look
so numerous


Now they look
so numerous
But in programming,
this is not a problem.


Now they look
so numerous
But in programming,
this is not a problem.
They are many, but they
are all the same!




Since they are all the same,
we can exterminate
them methodically.


Since they are all the same, we can exterminate them methodically.
We can call the same method over and over again to squash them all in the same way


In the case of sorting,
squashing them
is not even needed.


In the case of sorting,
squashing them
is not even needed.
A list with a single element
is intrinsically sorted.






After solving all
the individual
sub problems

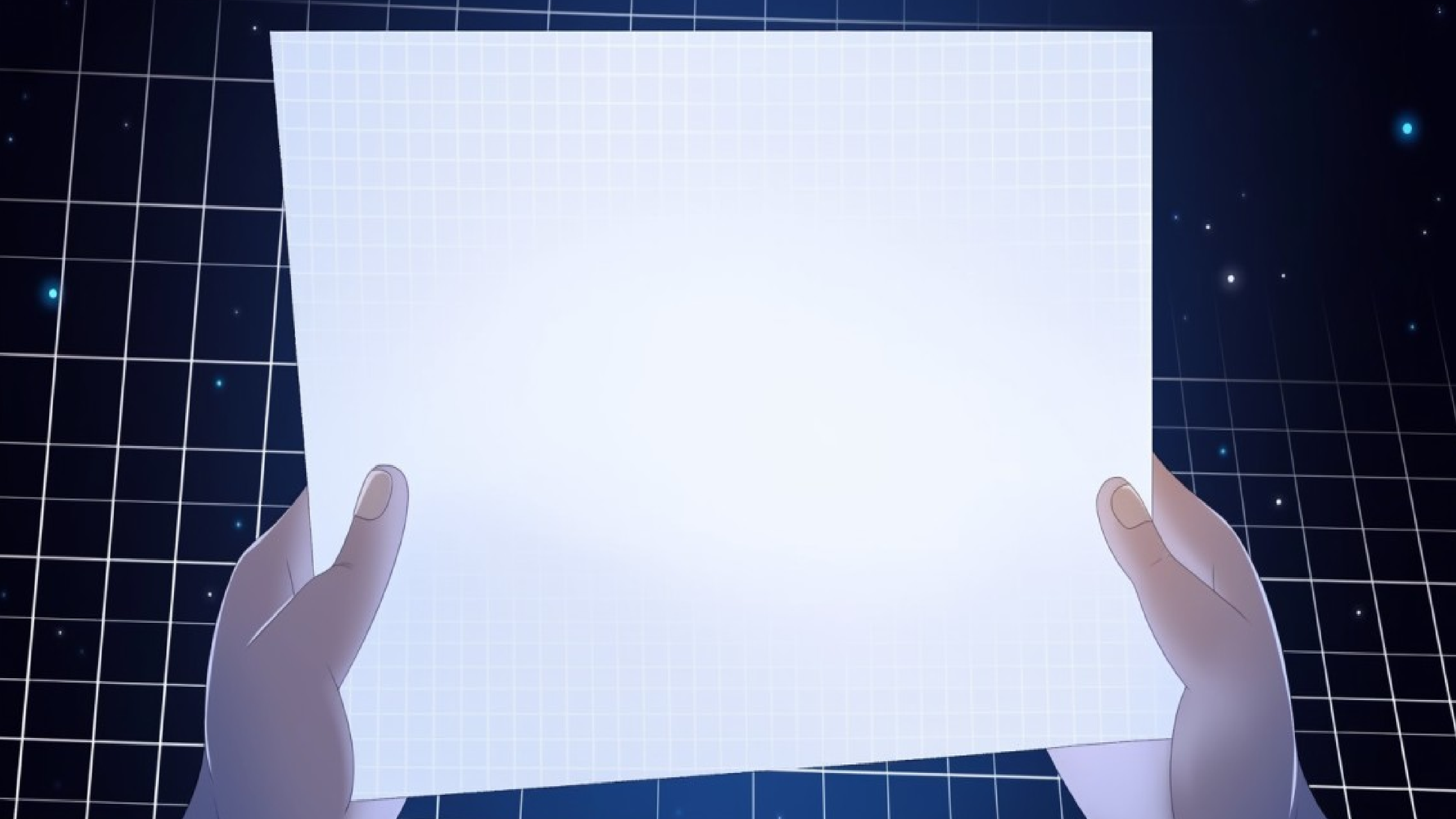

After solving all the individual sub problems
We need to do one last thing.

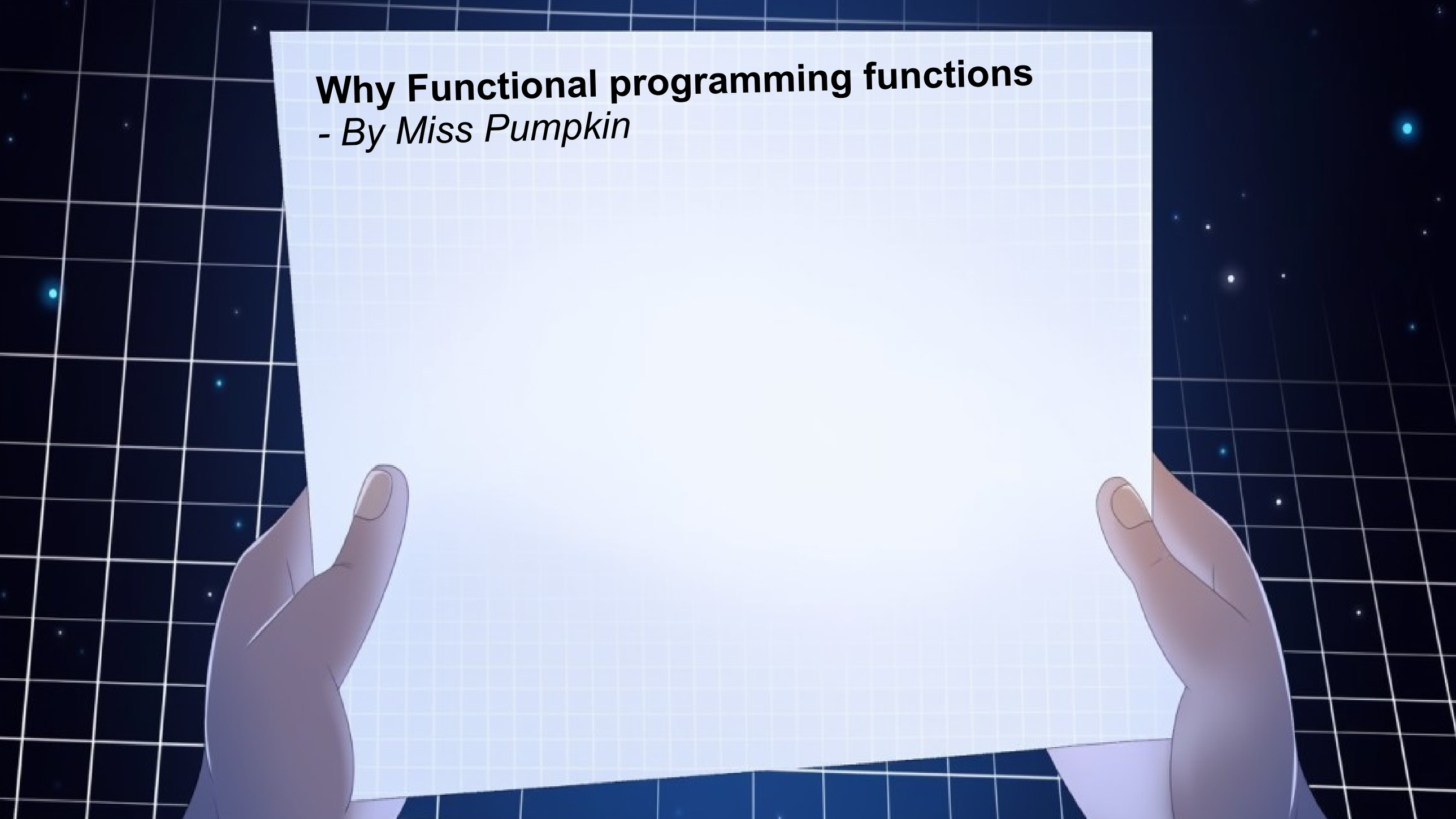

After solving all the individual sub problems
We need to do one last thing.

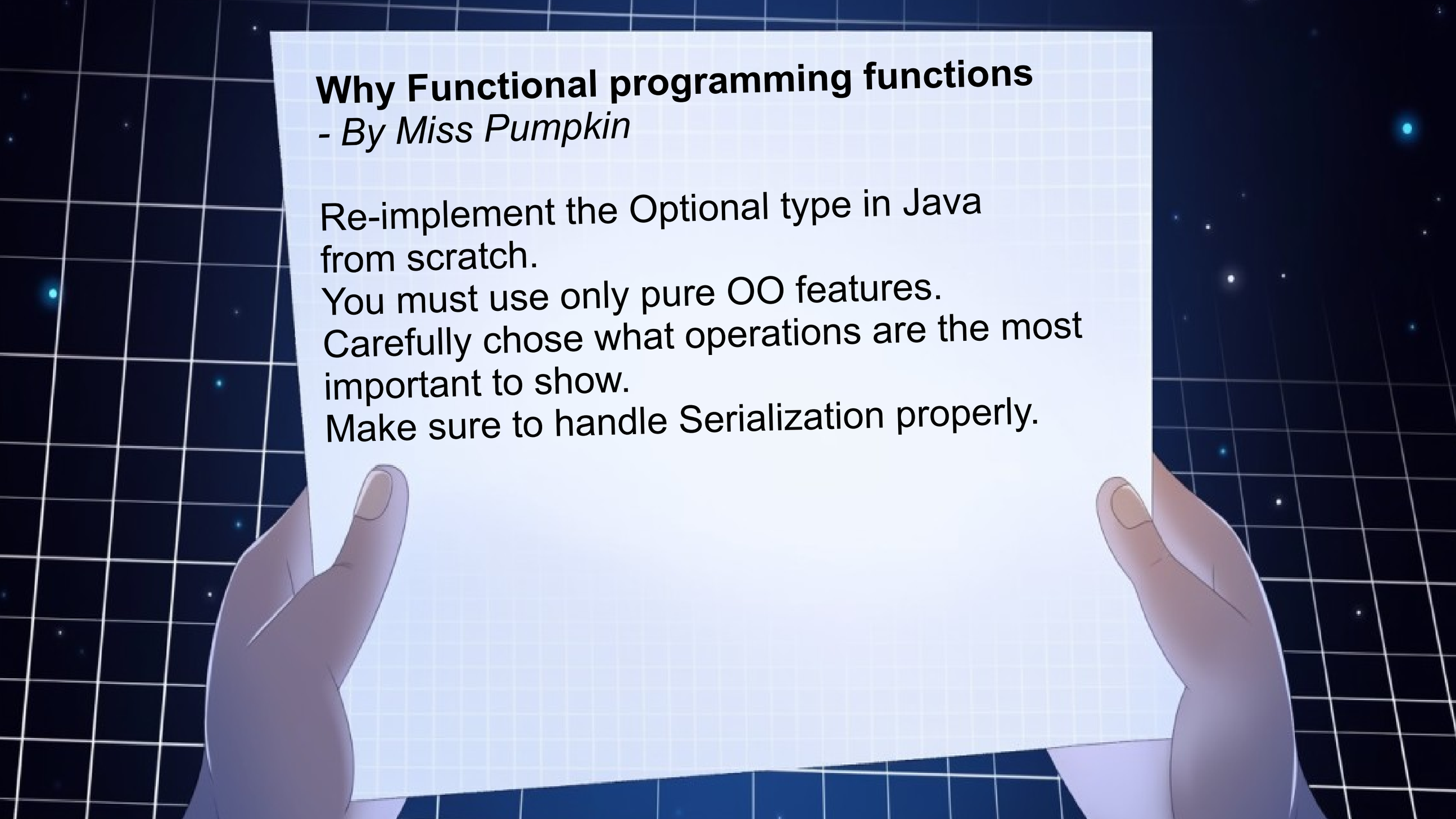

Merge solved solutions
into larger solution.


I think I can do it!

Let see the second script




Why Functional programming functions
- By Miss Pumpkin


Why Functional programming functions
- By Miss Pumpkin
Re-implement the Optional type in Java from scratch.
You must use only pure OO features.
Carefully chose what operations are the most important to show.
Make sure to handle Serialization properly.


Yes, I think I can do this too!


Yes, I think I can do this too!
Hi Dany, Mewice
to see you again.


I’m CAT, the computerized automated tutor


I’m CAT, the computerized automated tutor
I’m here to supervise you


I'm CAT, the computerized automated tutor
I'm here to supervise you
... and to guide you in submitting your answers


CAT is here?


CAT is here?
I’ve got a bad feeling about this!