

The Clones of Mr C

ESC101: Fundamentals of Computing

Purushottam Kar

Announcements

- Last date for dropping Advanced Track October 12
 - Application must be an email to instructor, mentors, teammates
- Last date for dropping ESC101 course October 12
 - Application must be on standard DoAA course drop form – no email!
- Joint tutorial for B1 and B14 on October 12
 - 12 – 1 PM (same time), L19 - just an arrangement for this week ☺



Clones!

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Clones!

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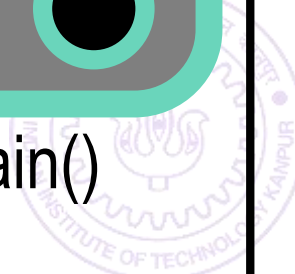
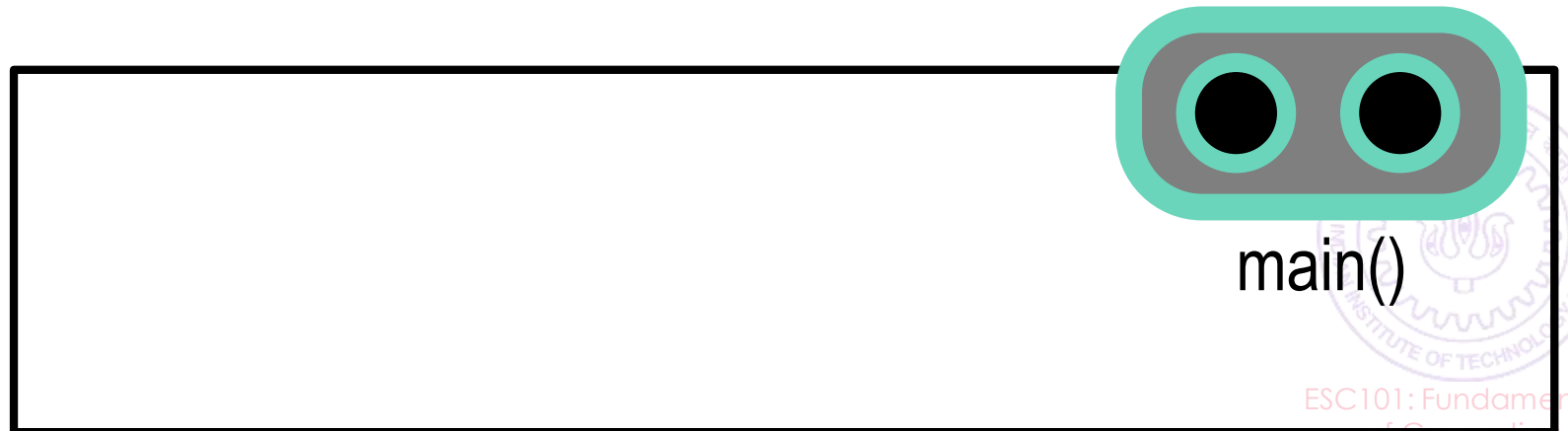
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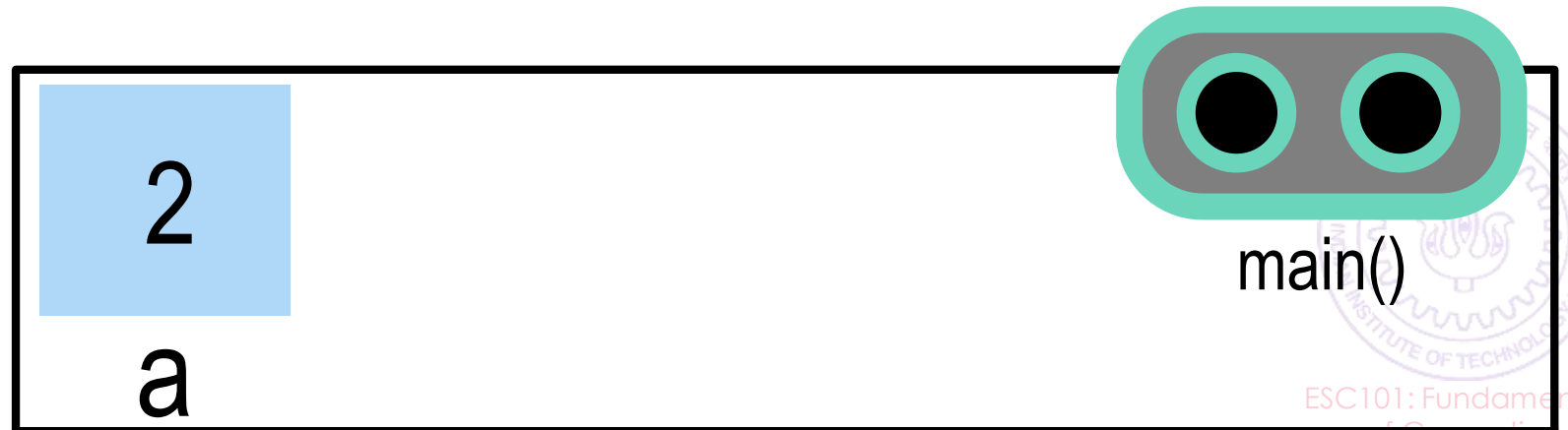
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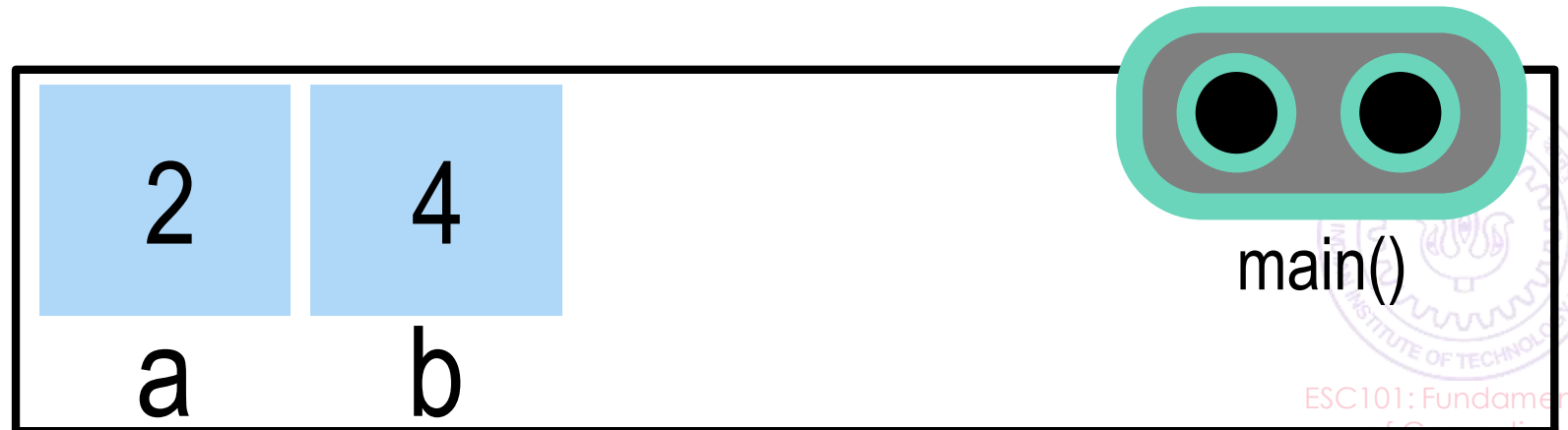
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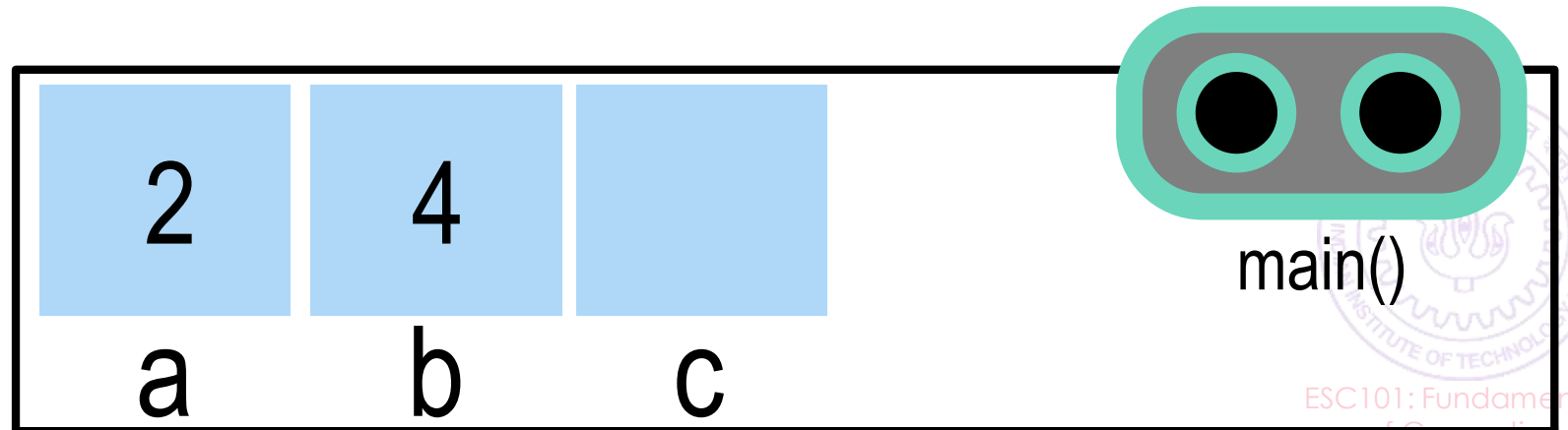
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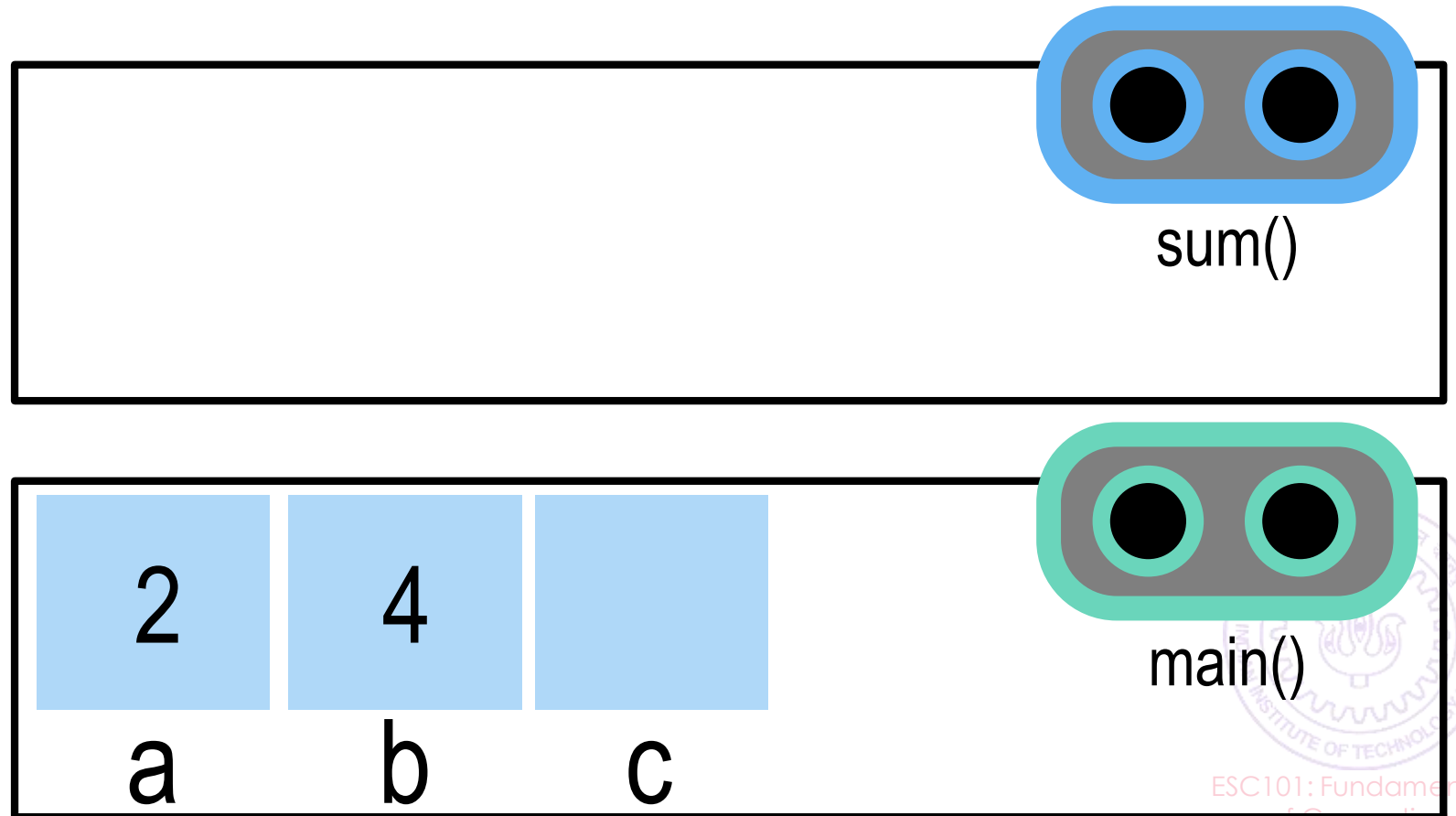
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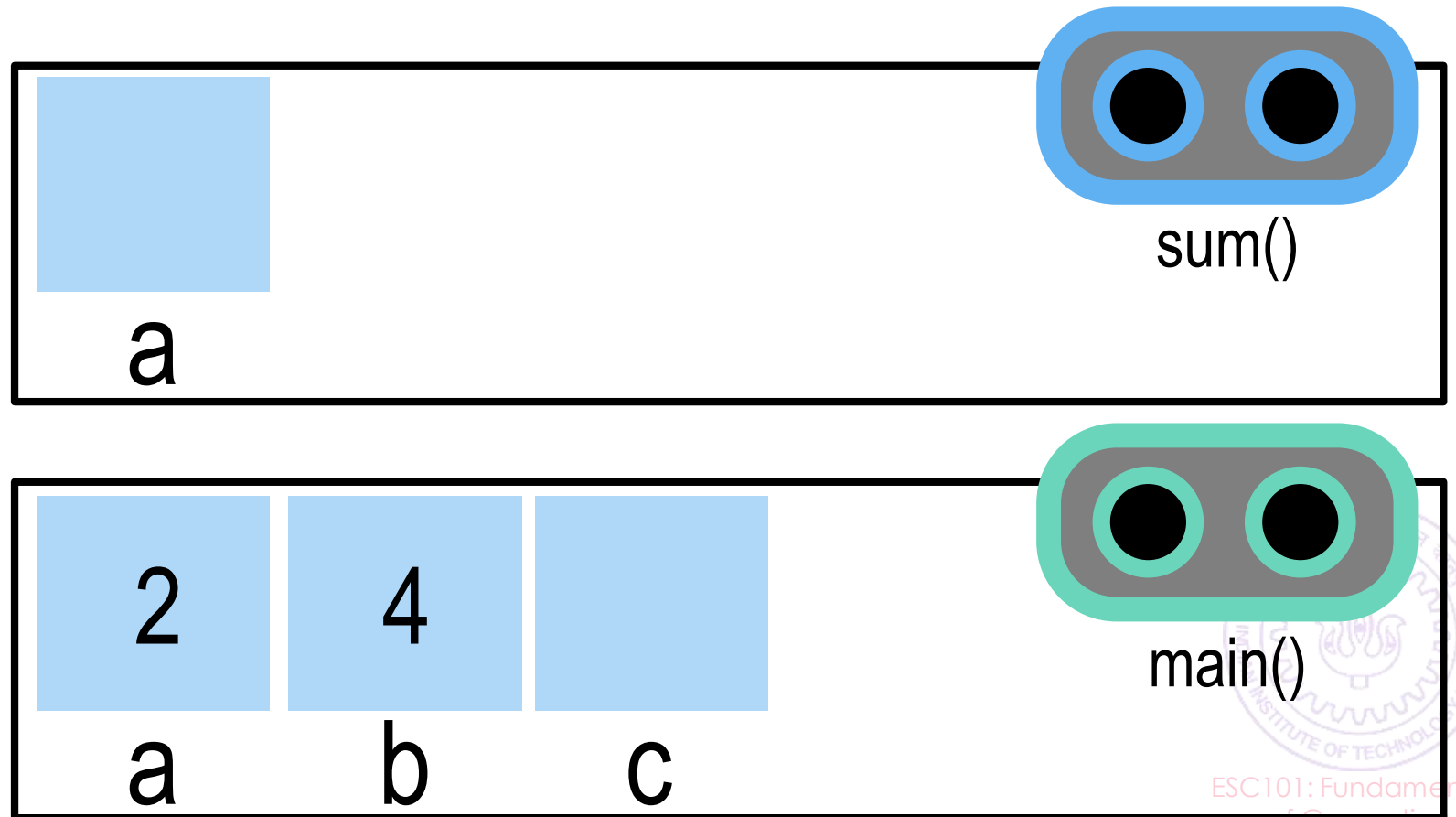
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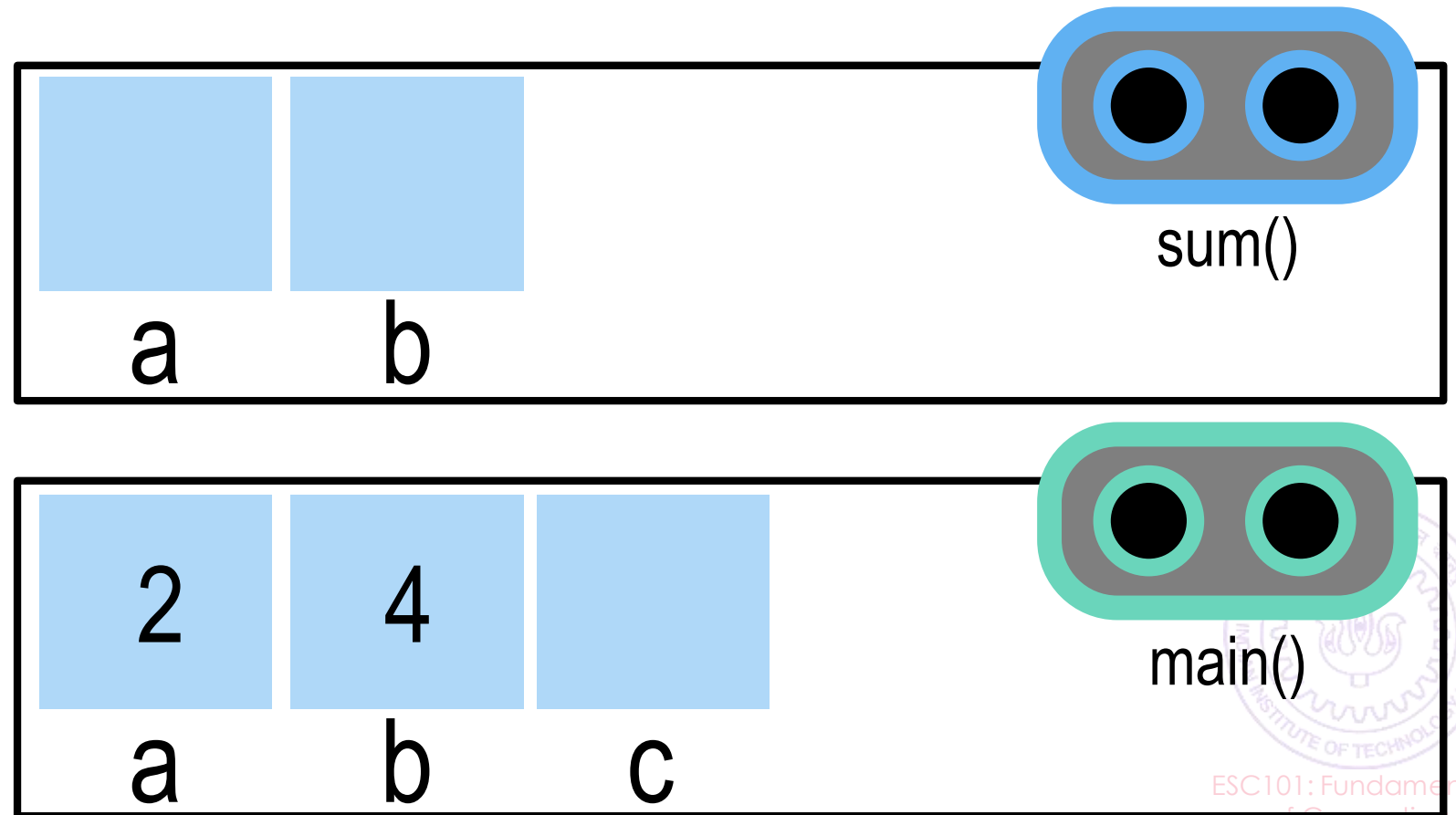
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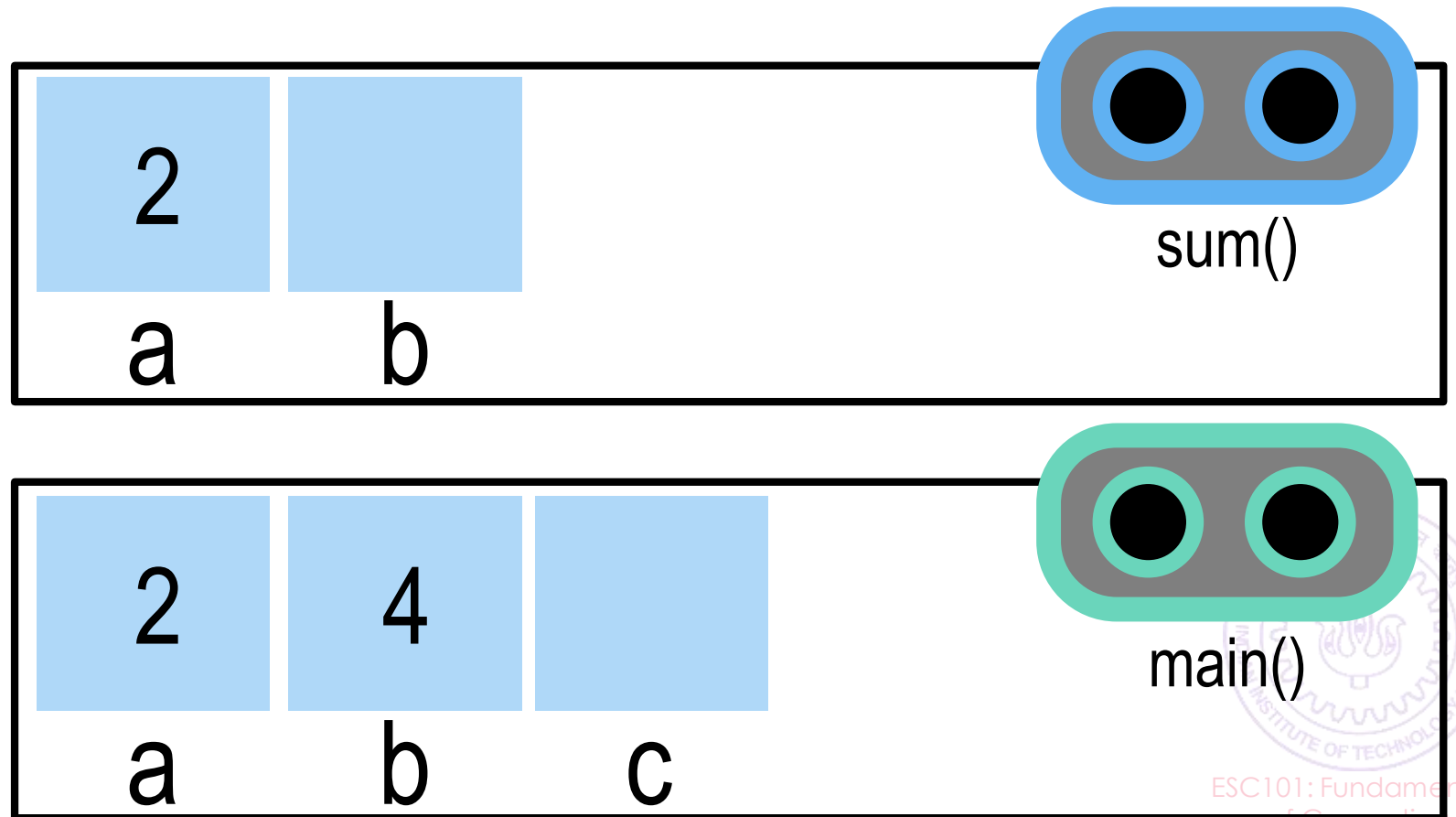
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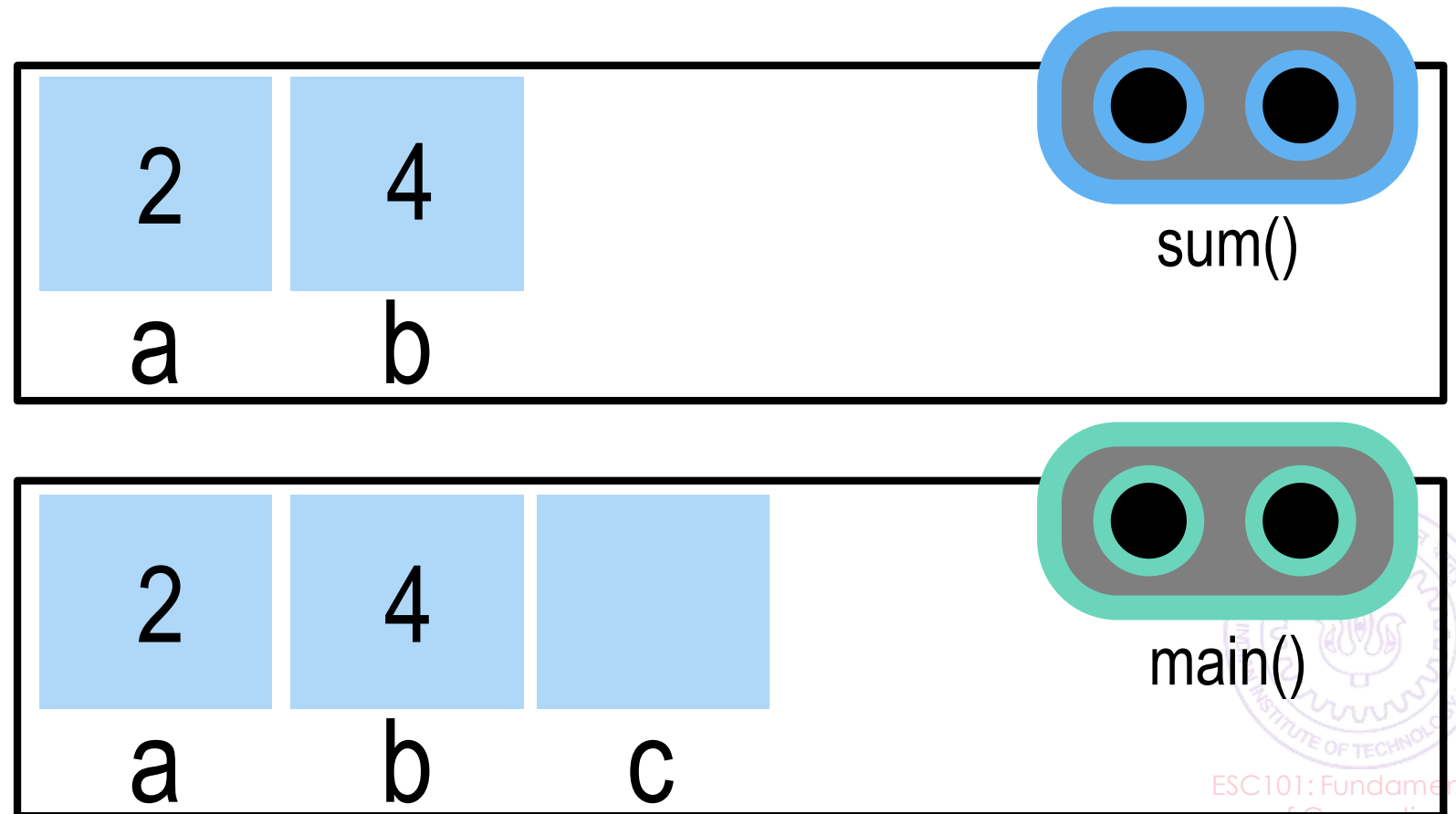
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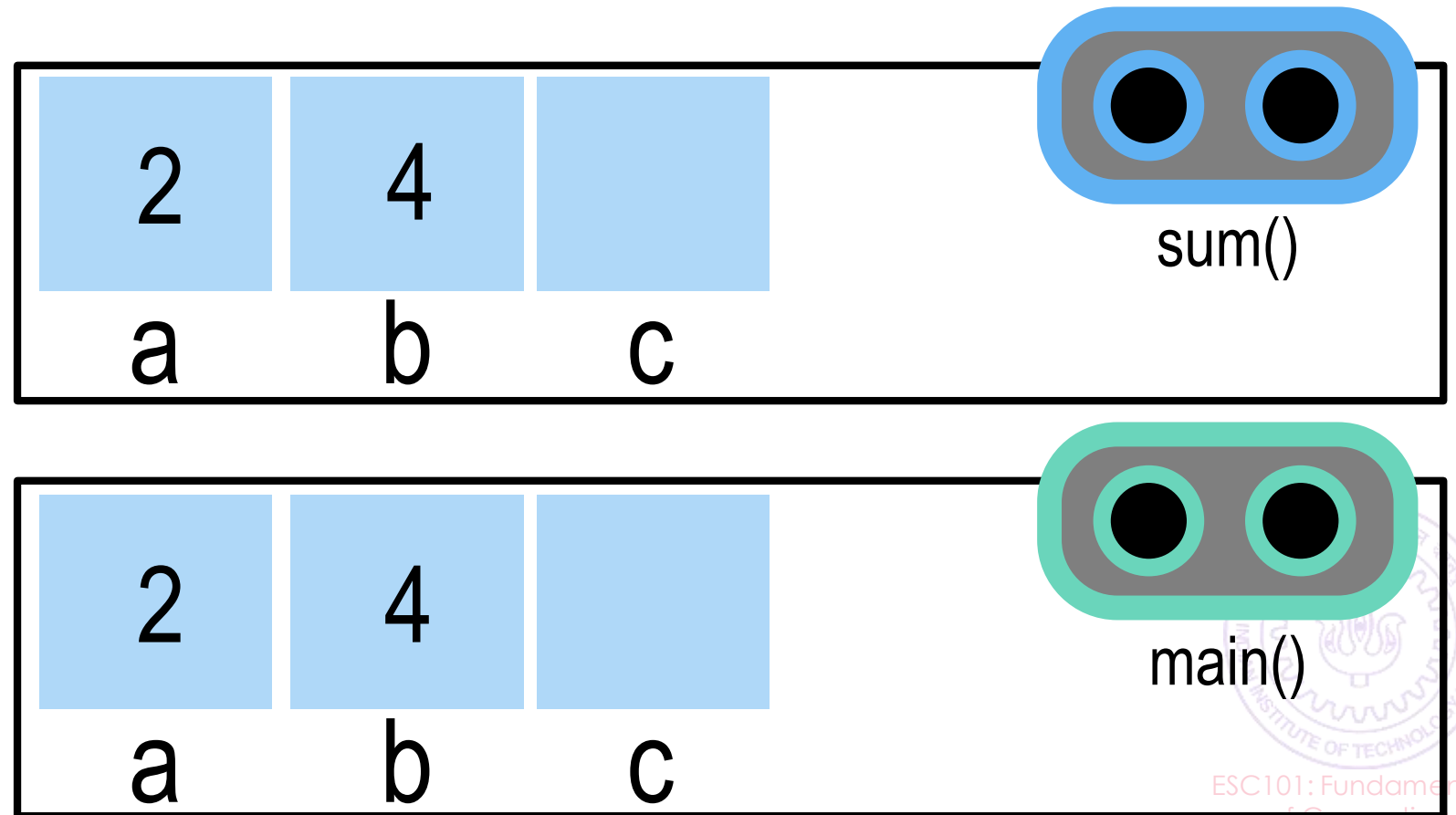
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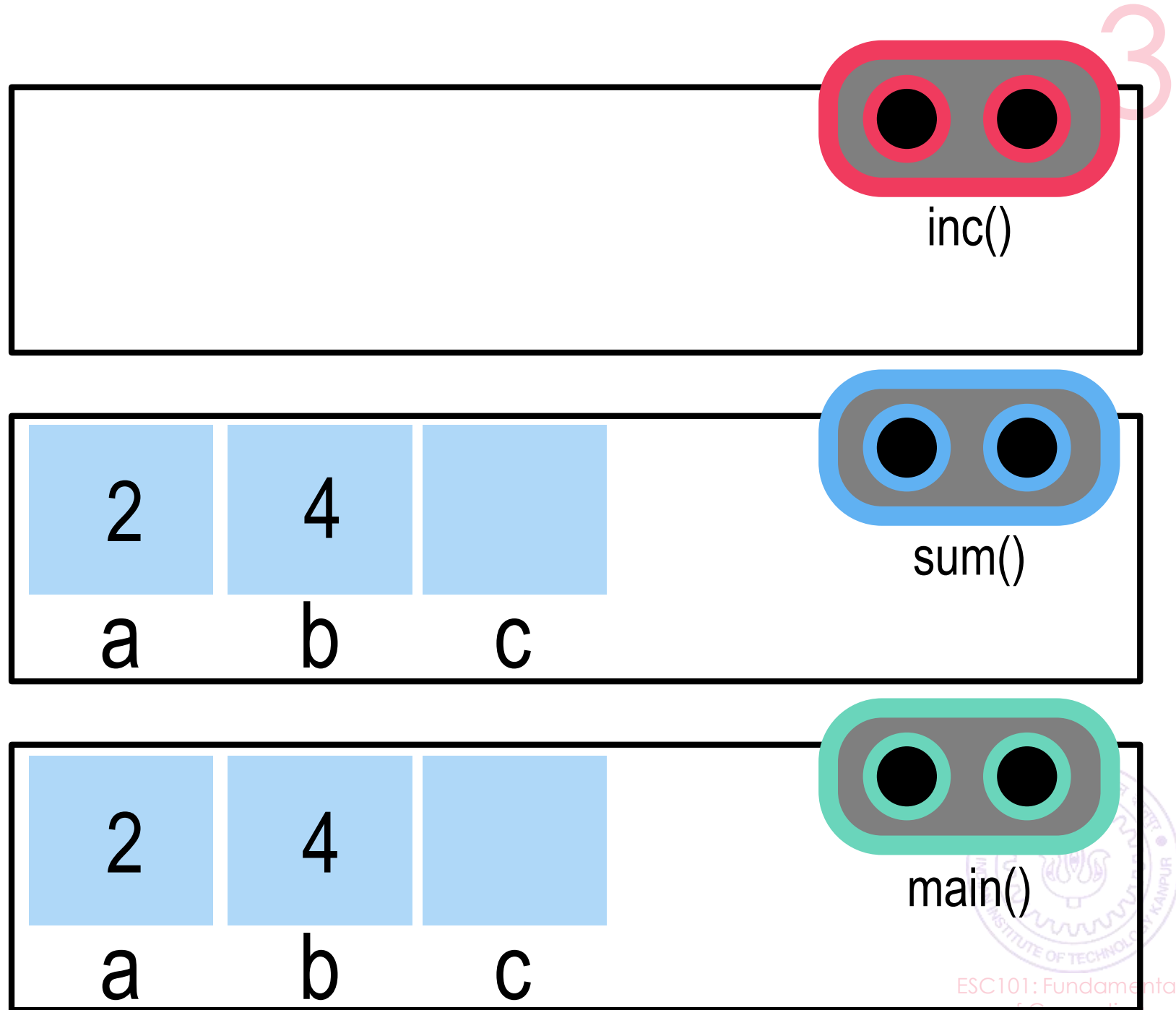
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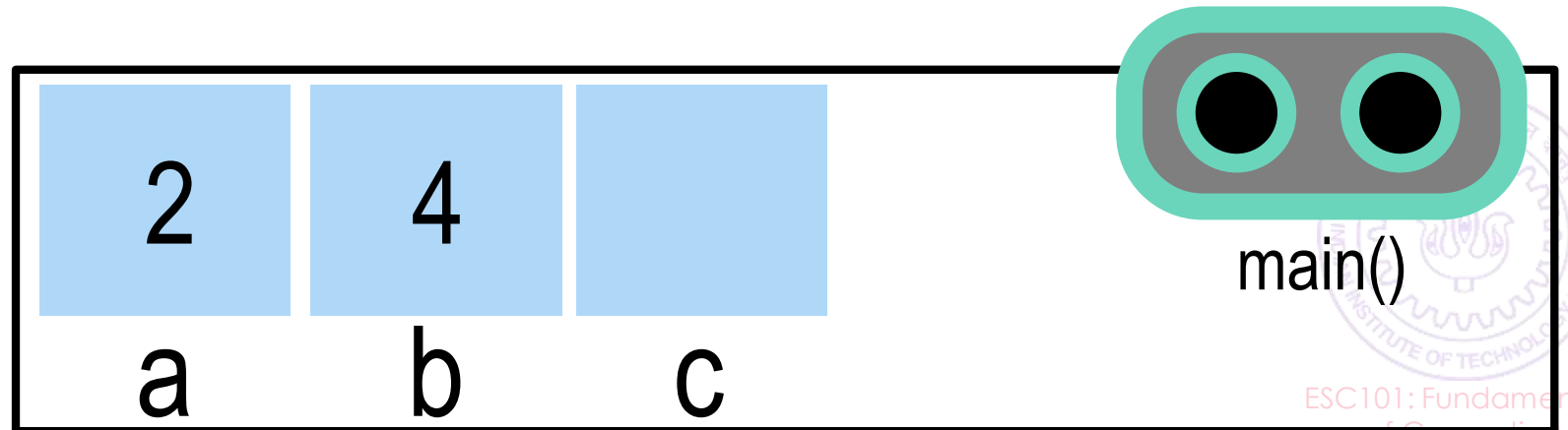
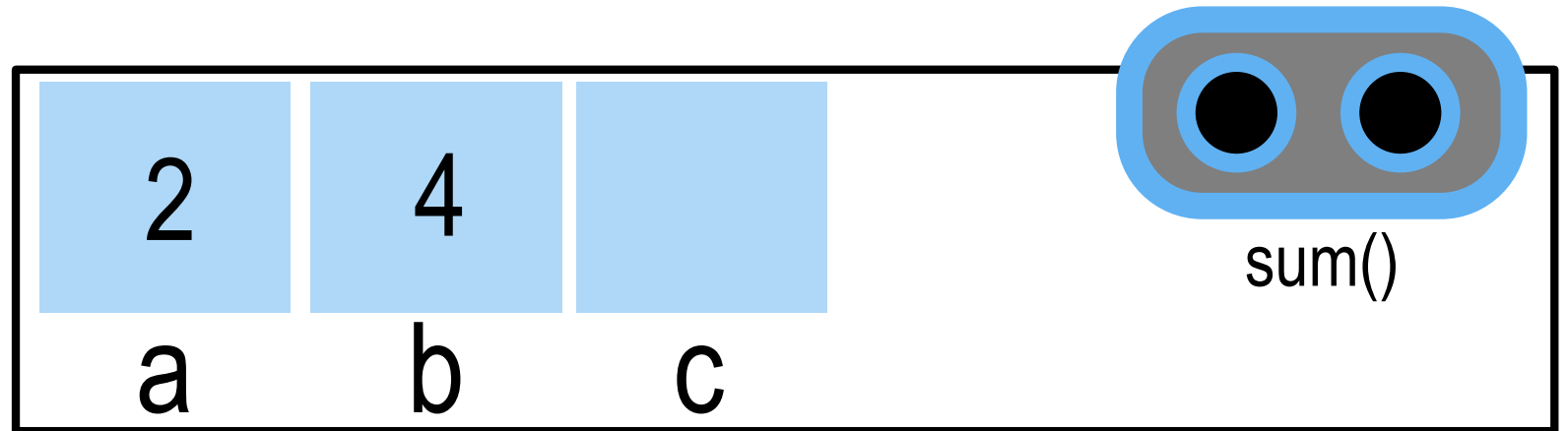
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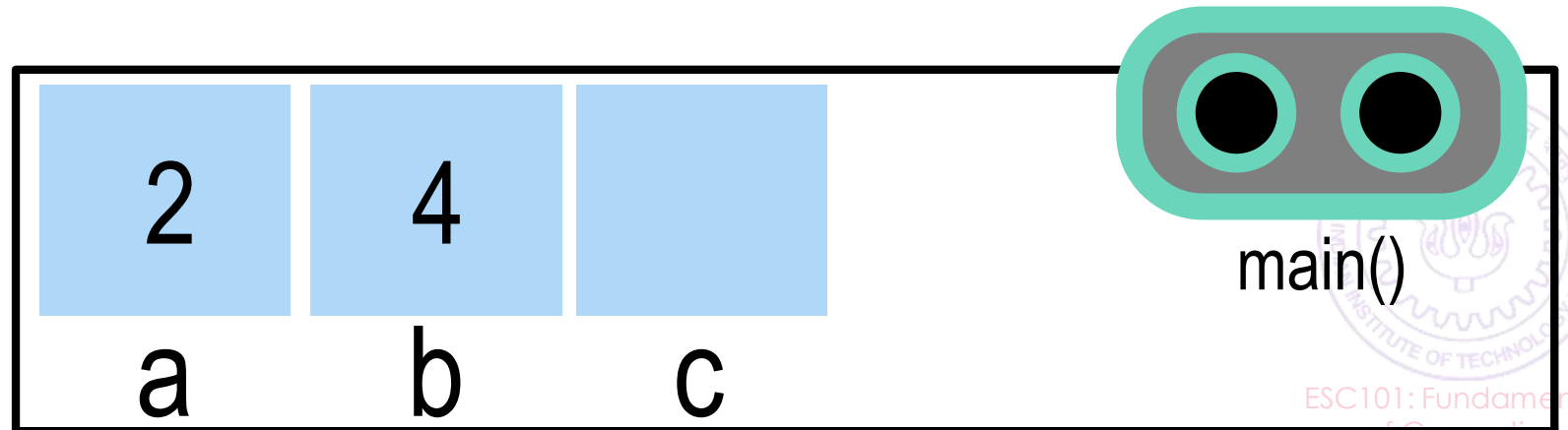
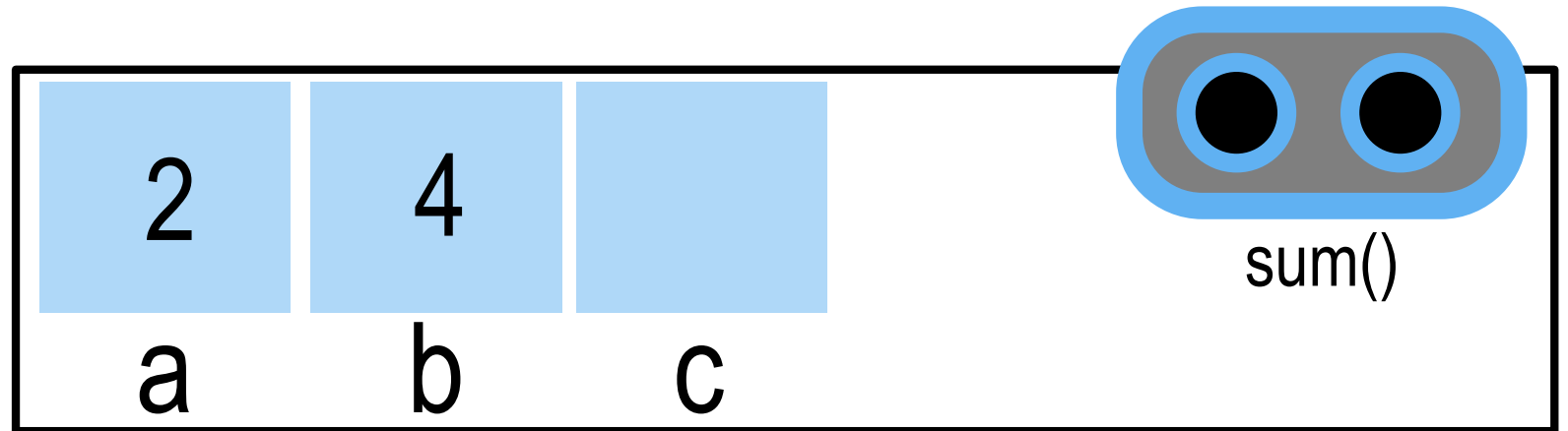
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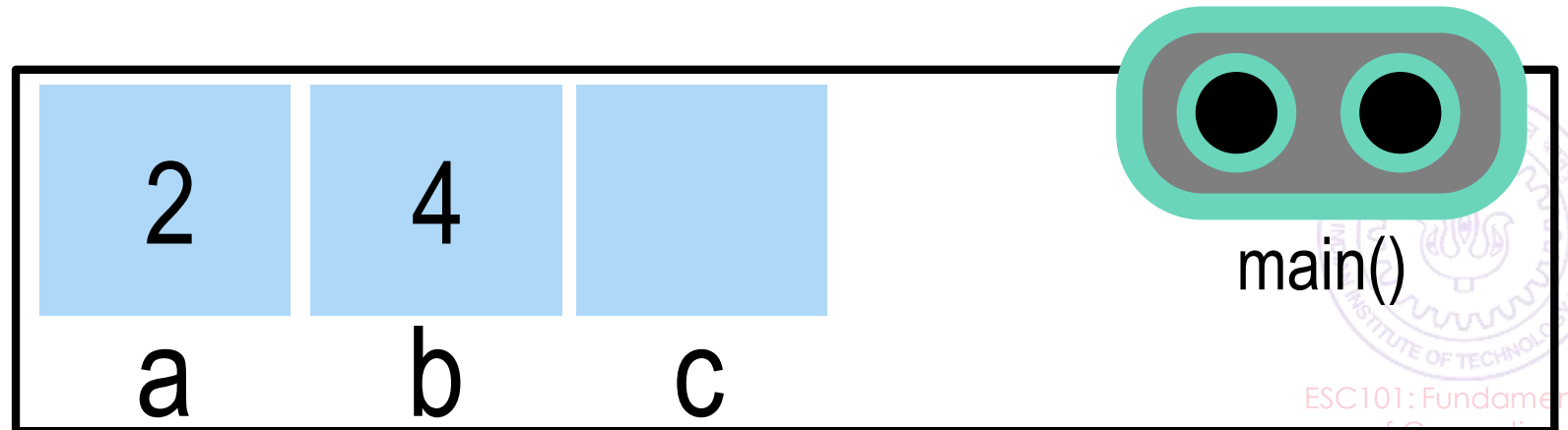
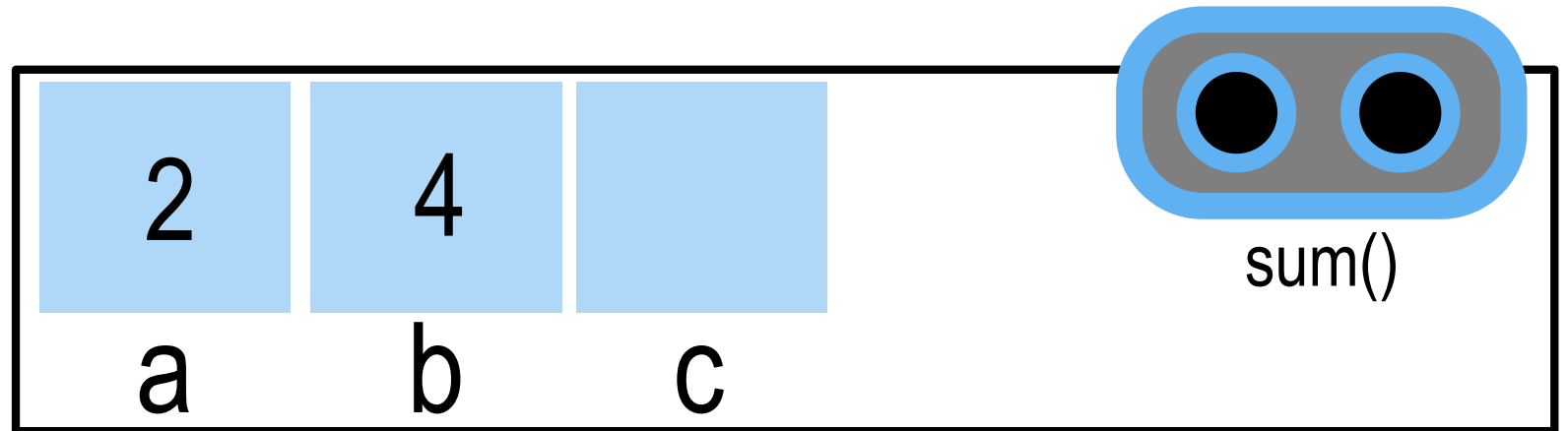
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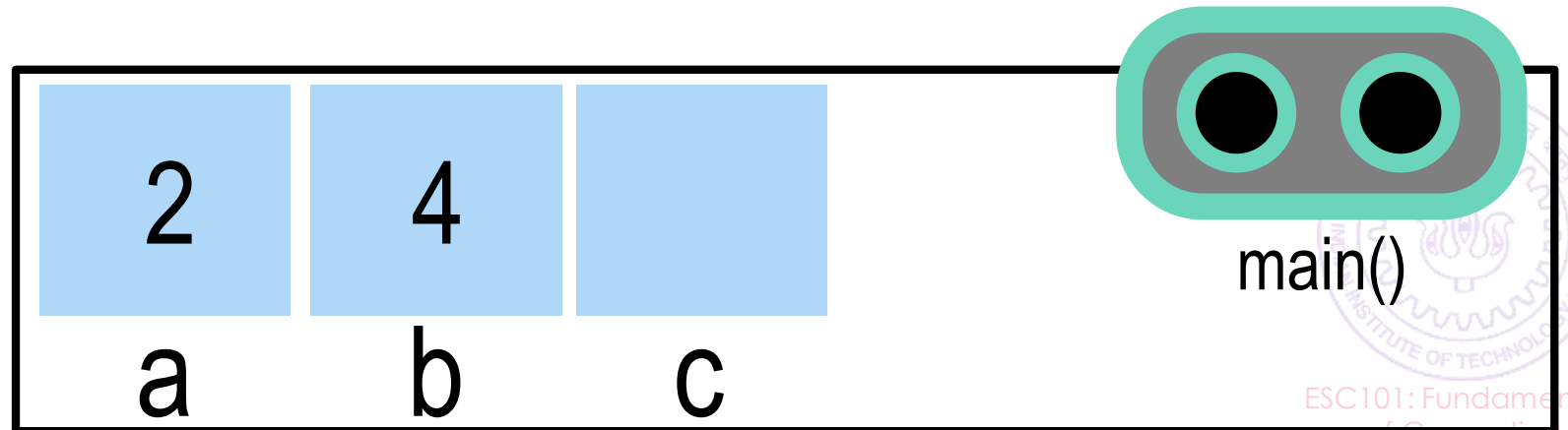
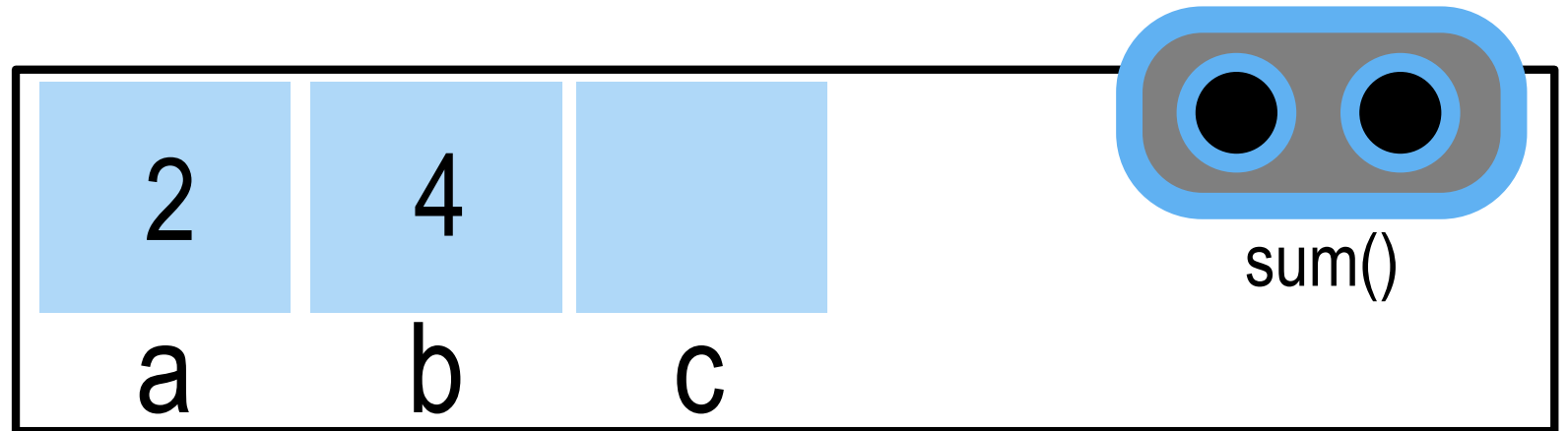
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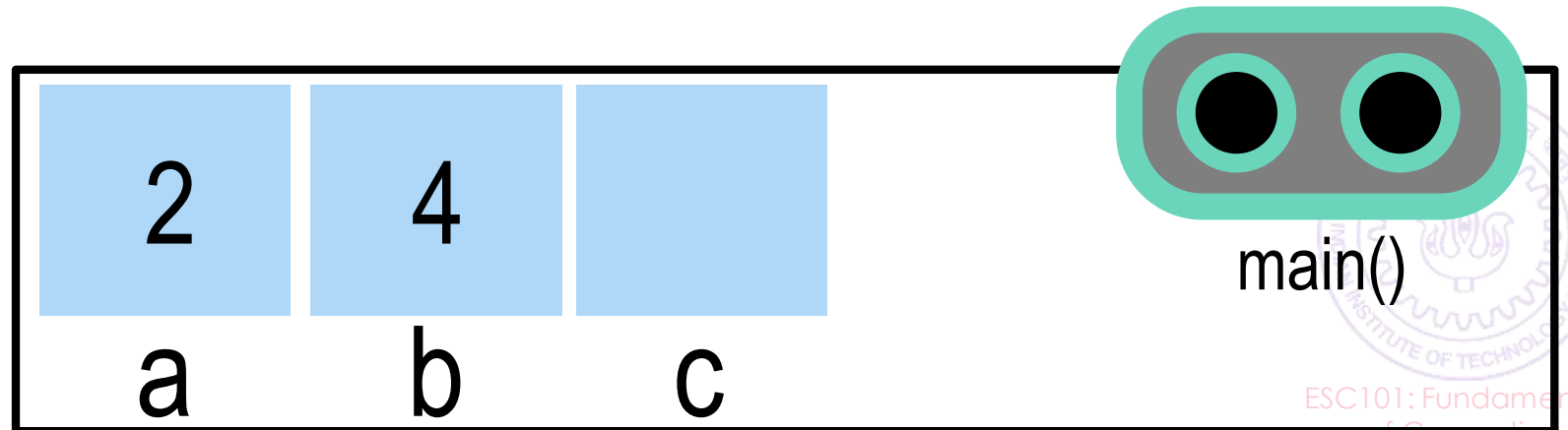
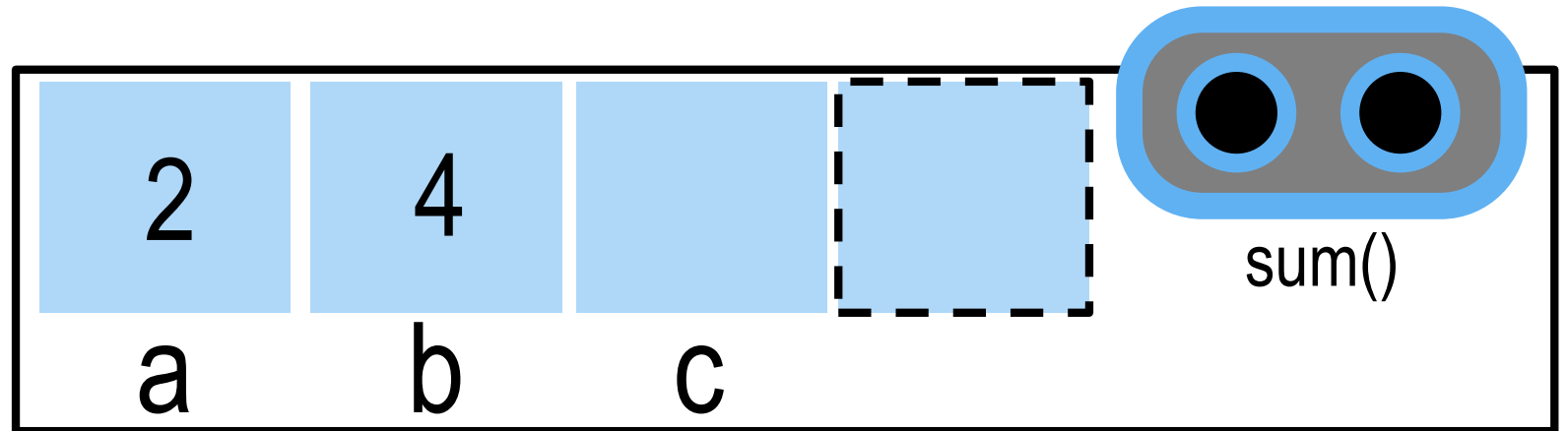
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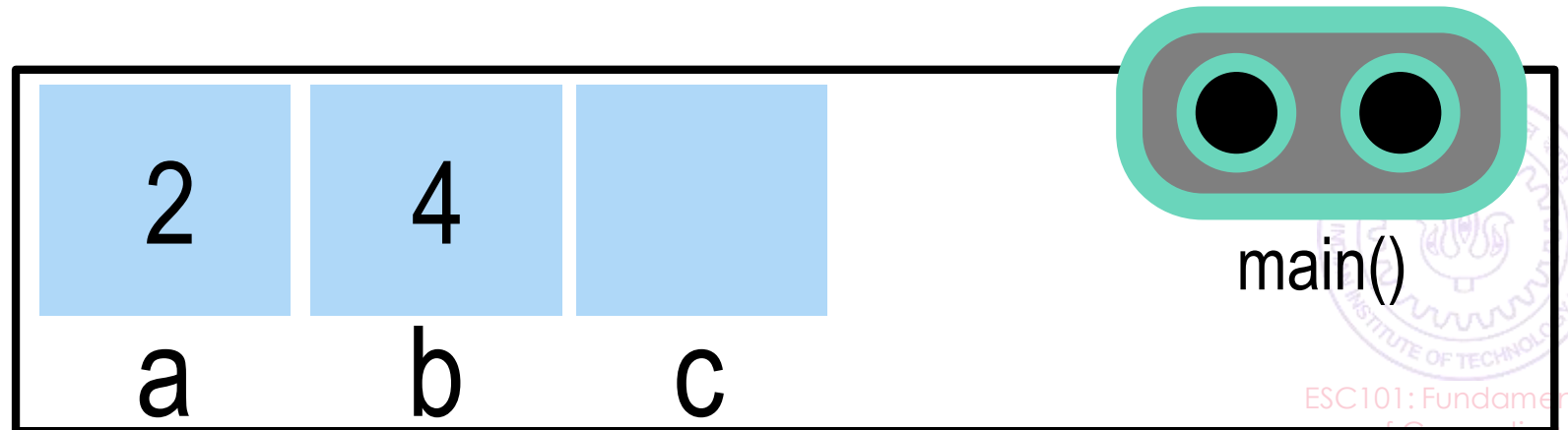
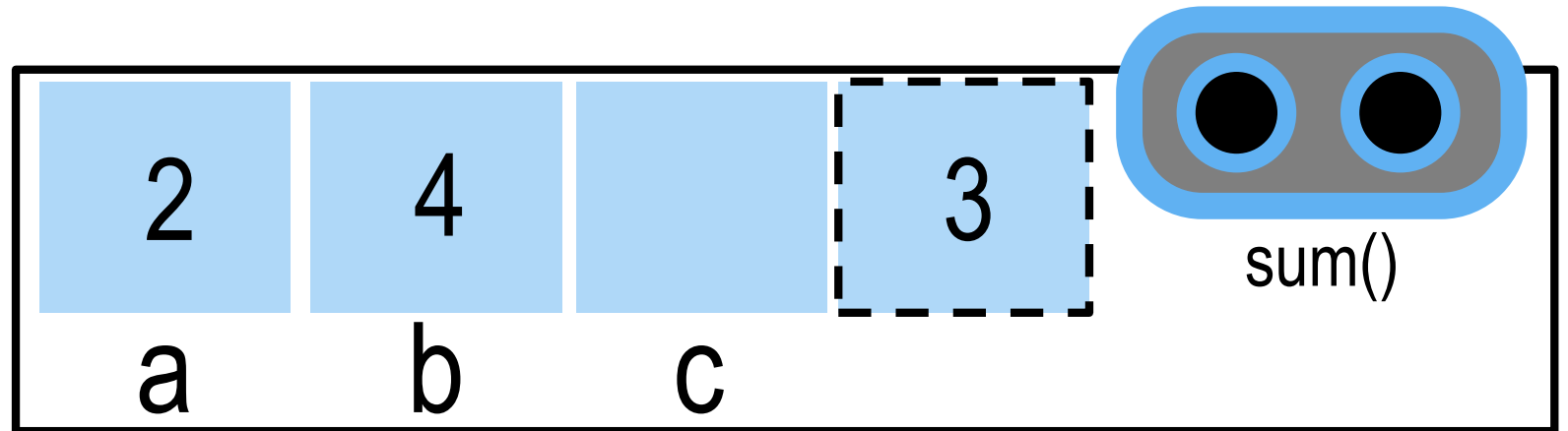
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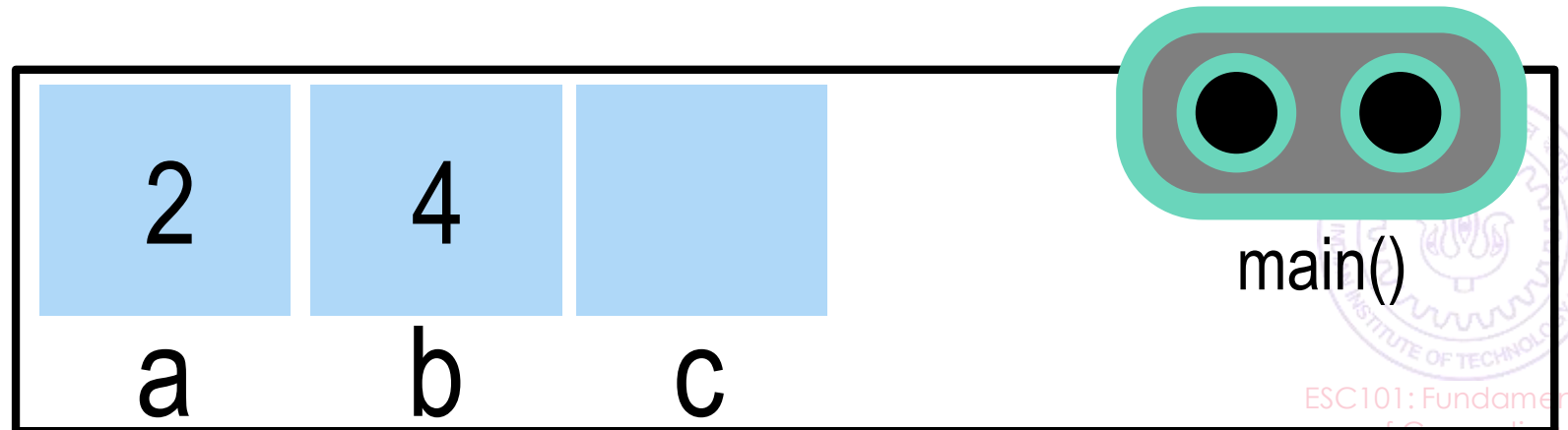
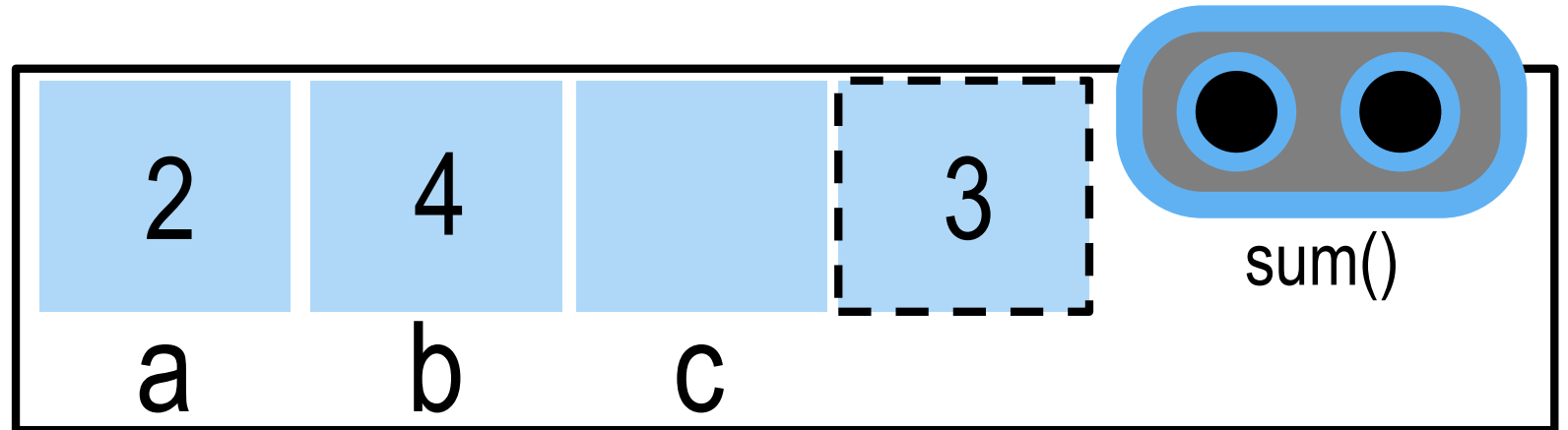
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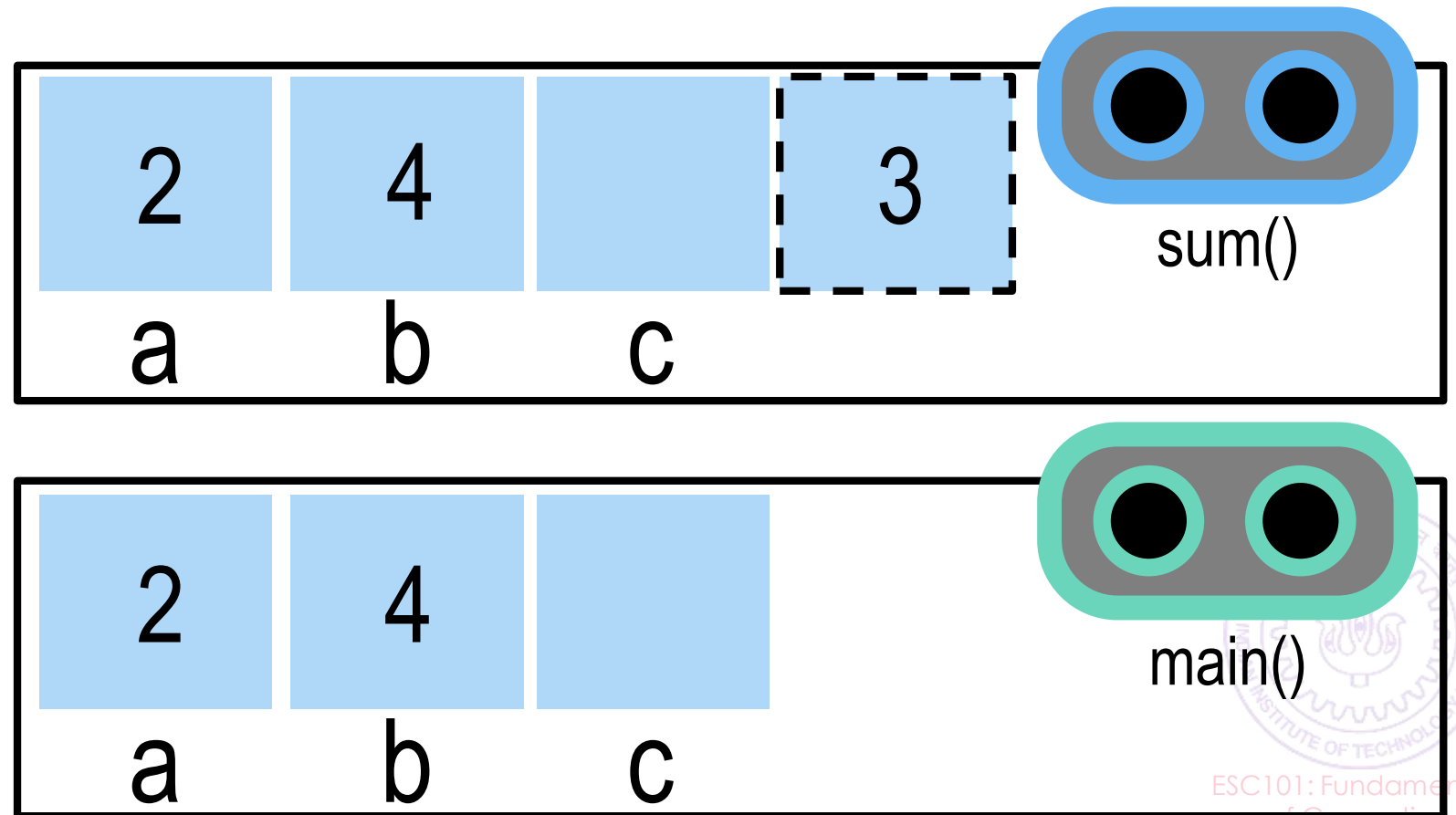
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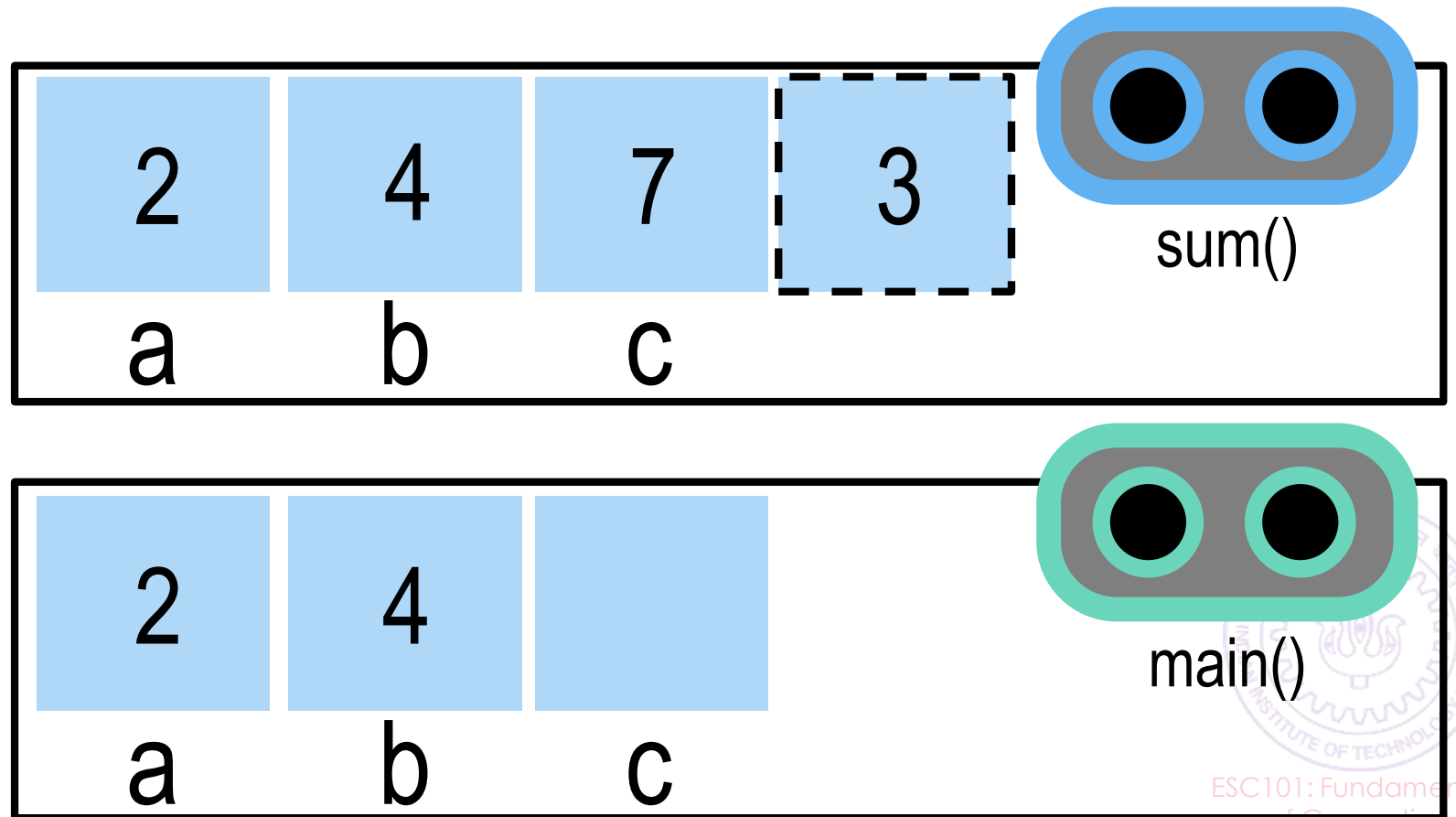
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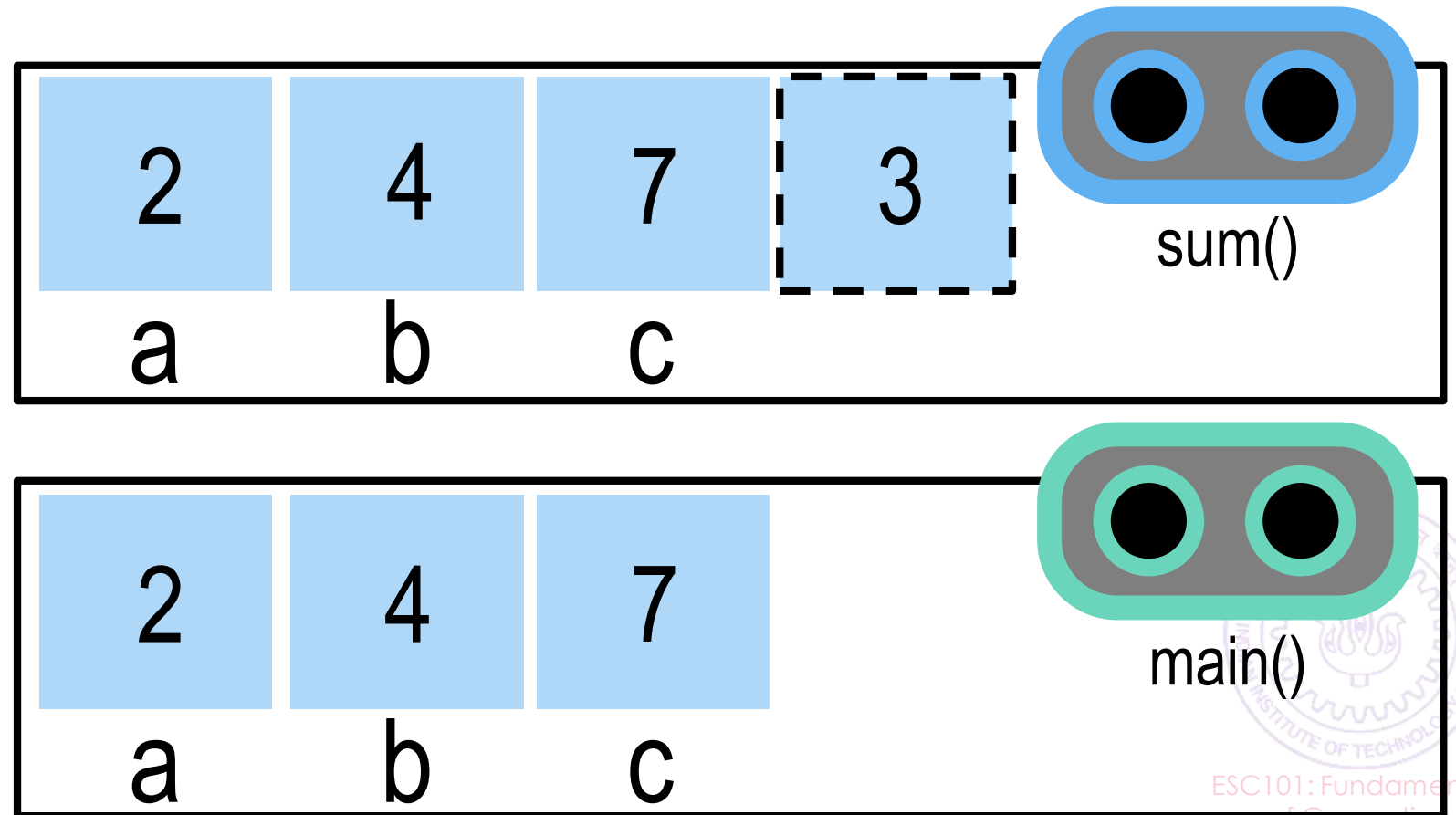
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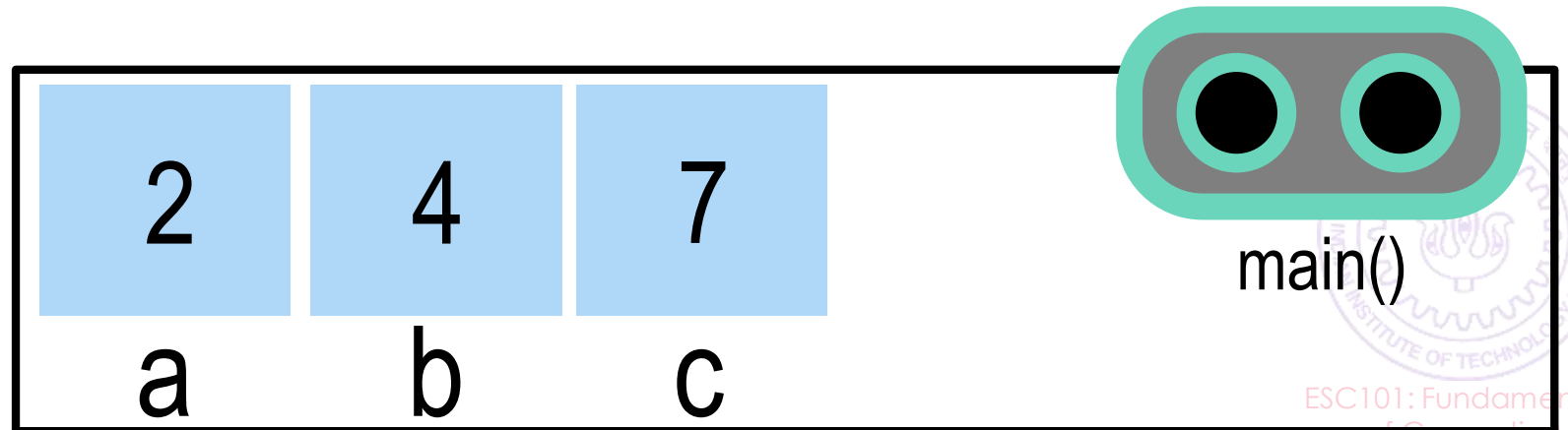
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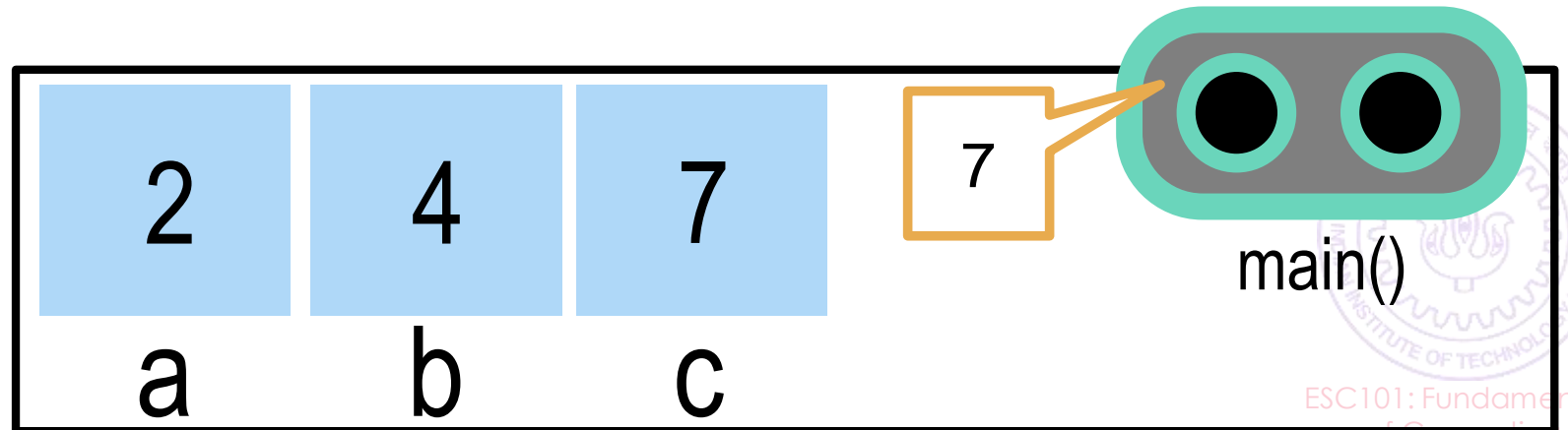
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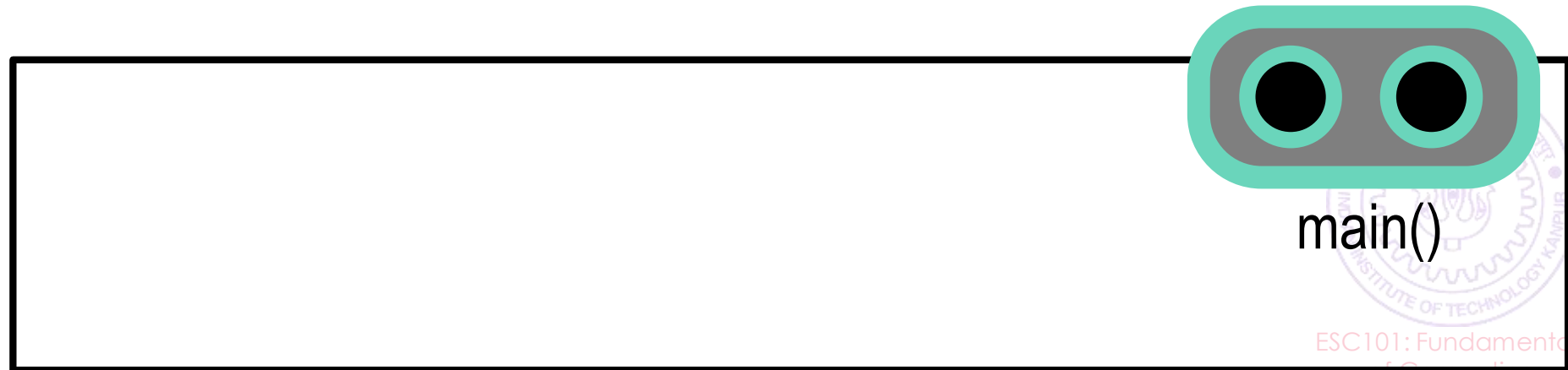
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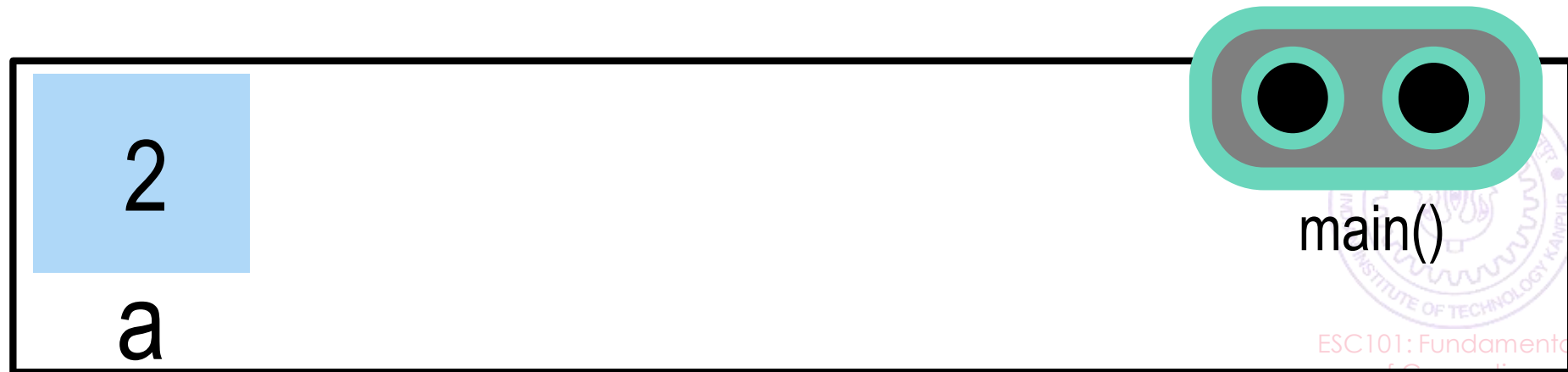
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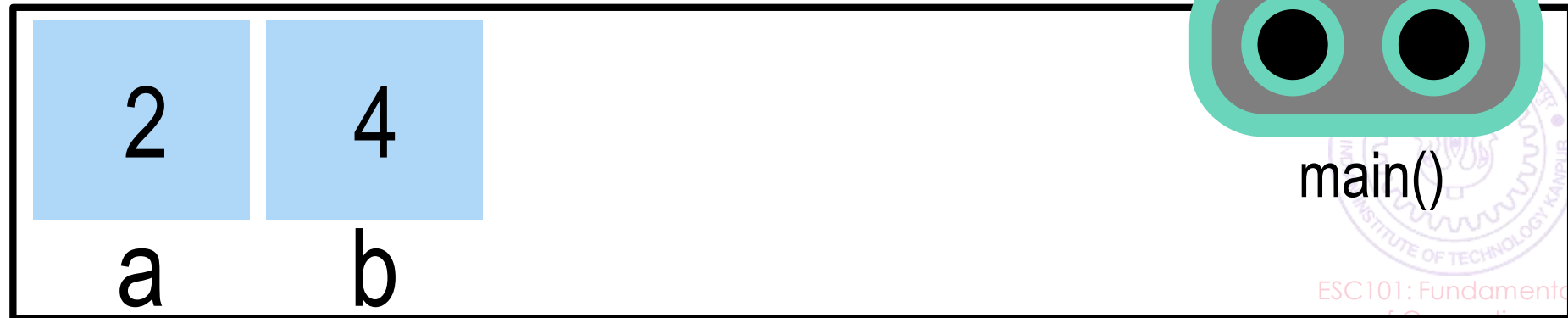
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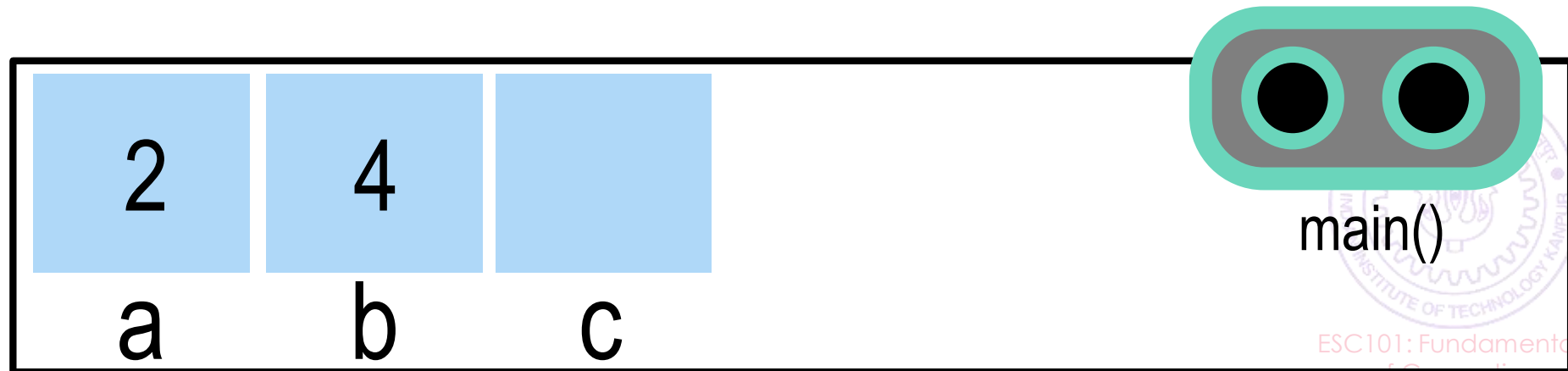
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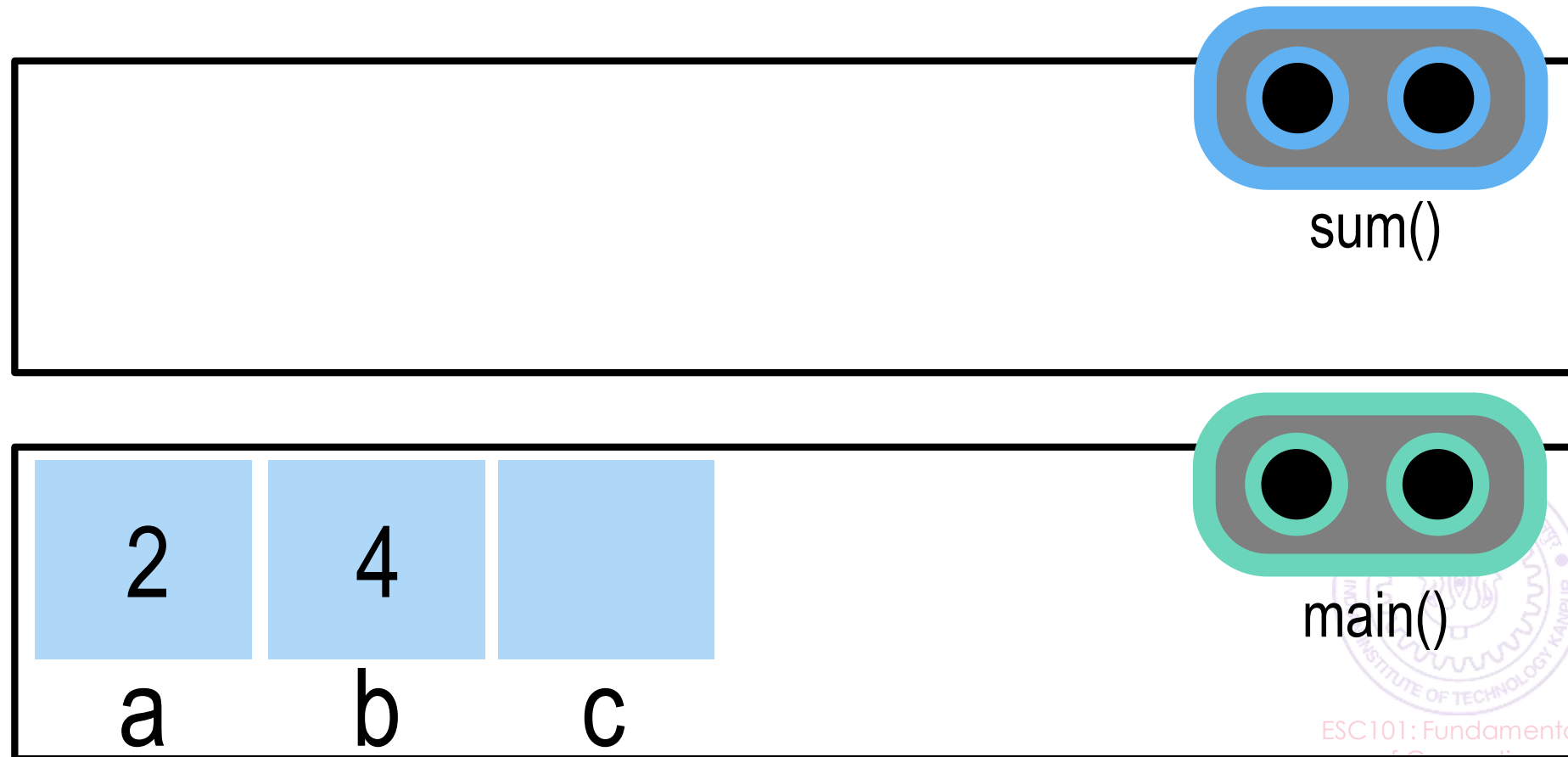
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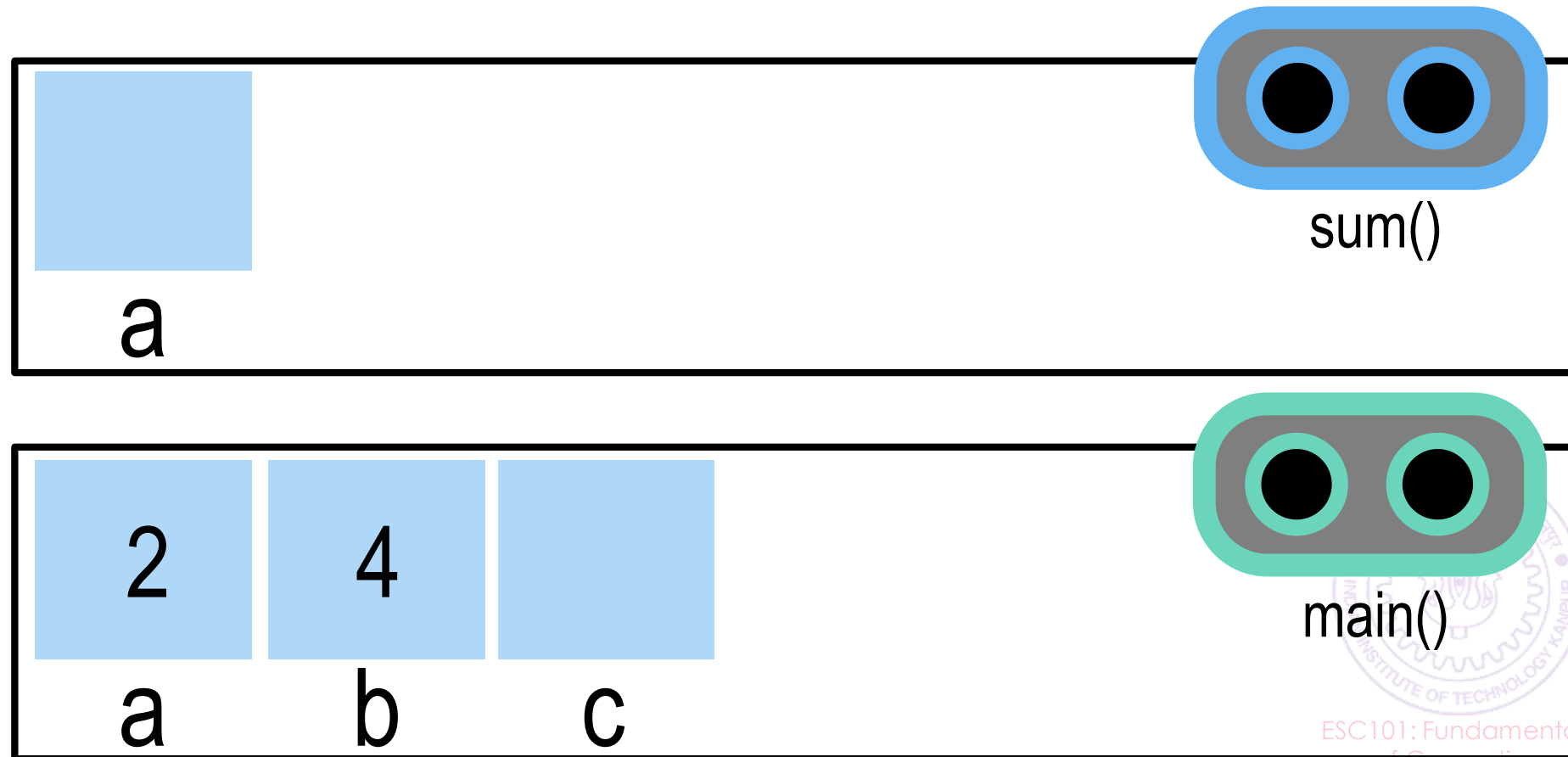
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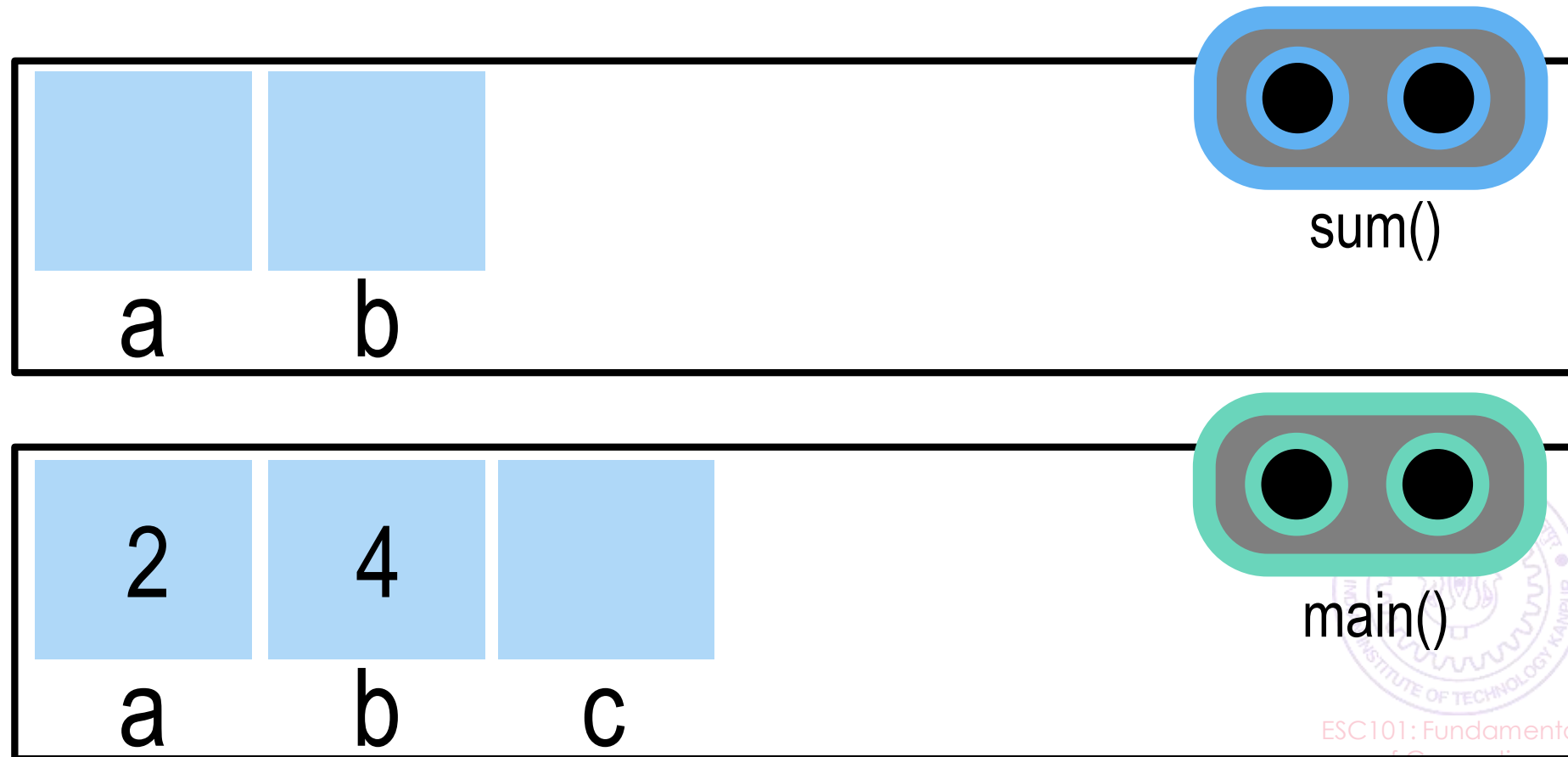
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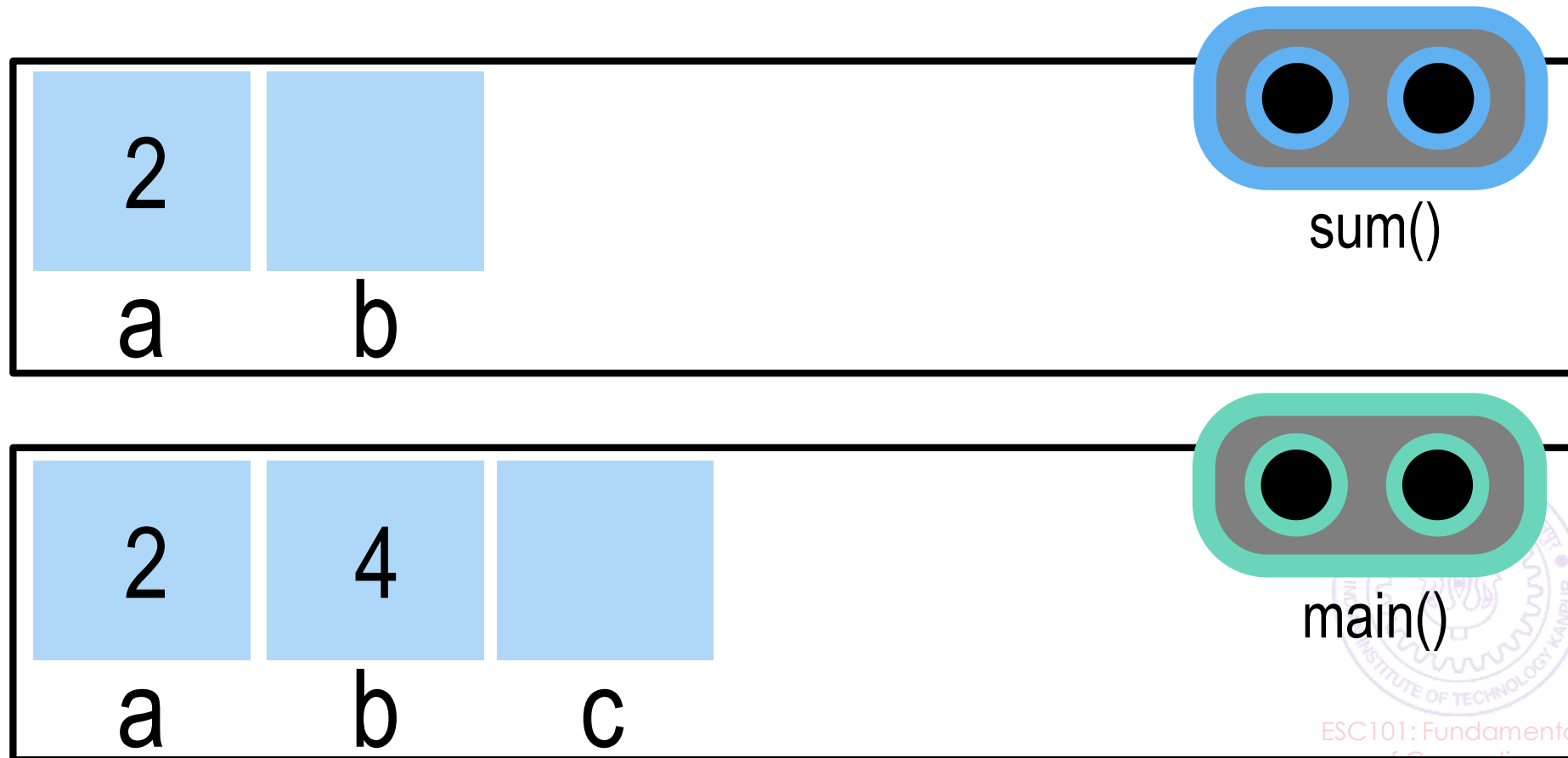
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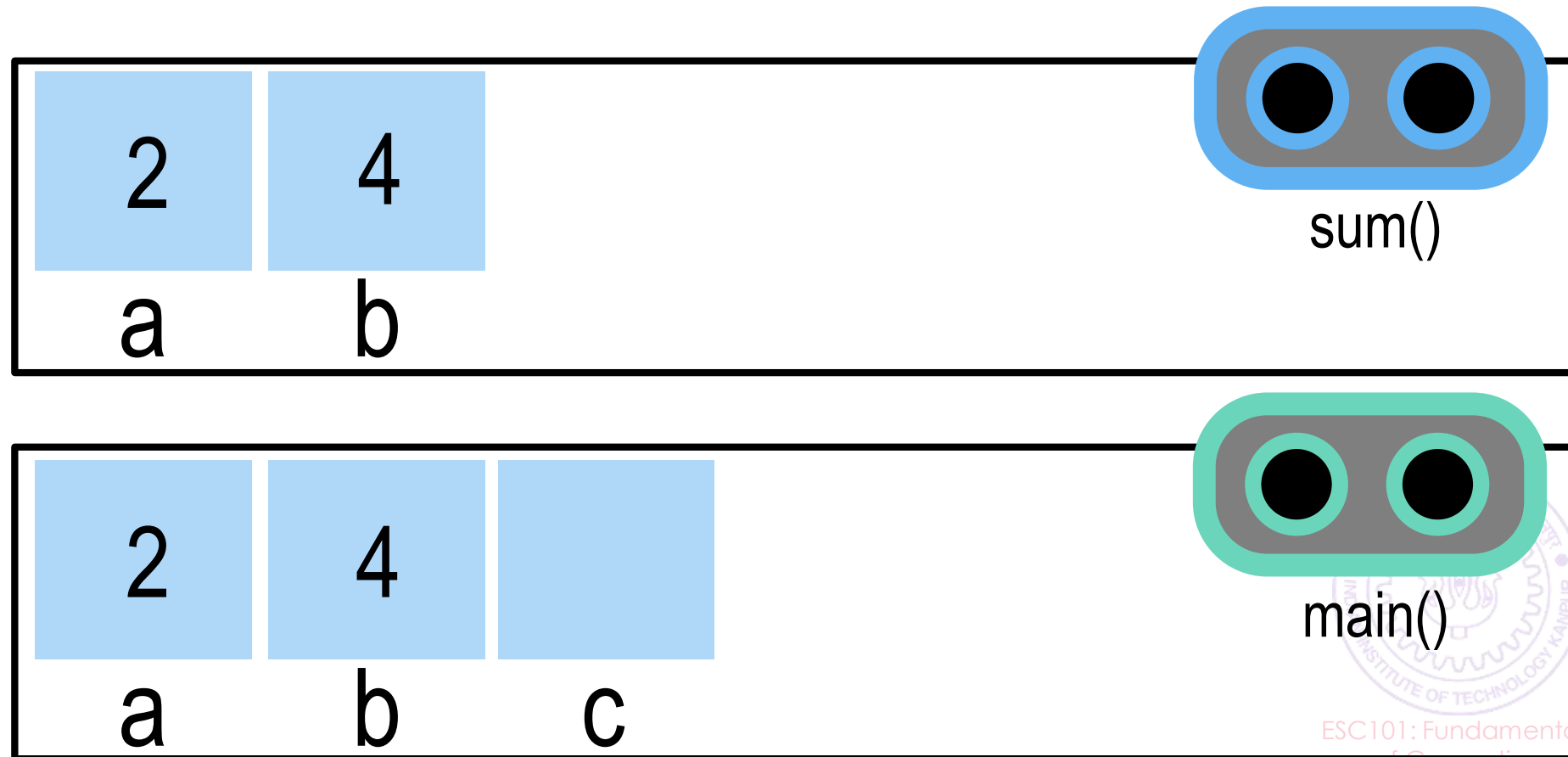
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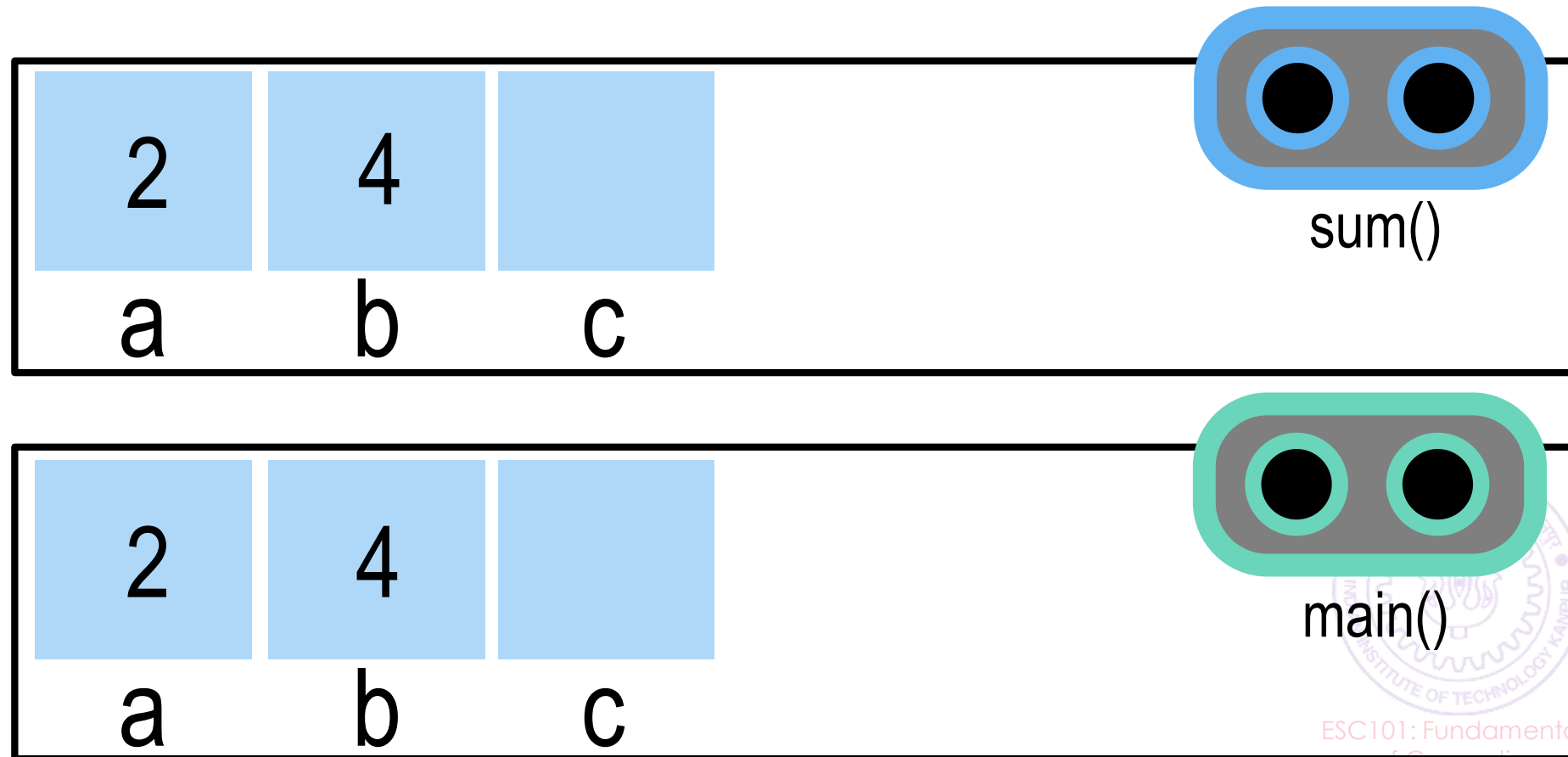
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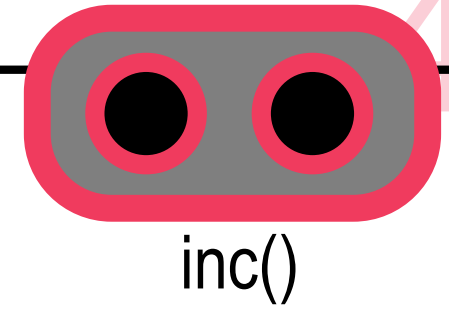
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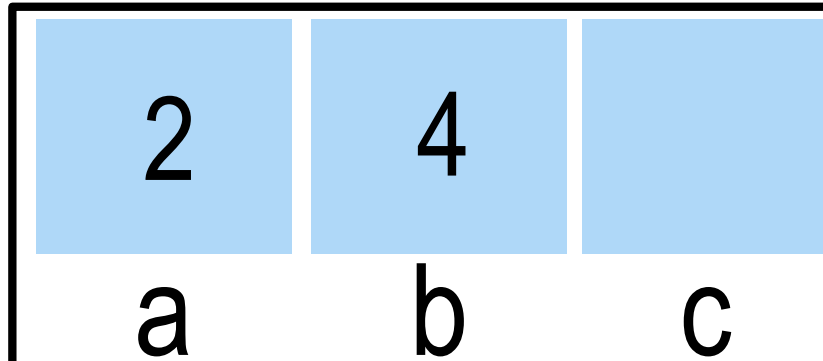


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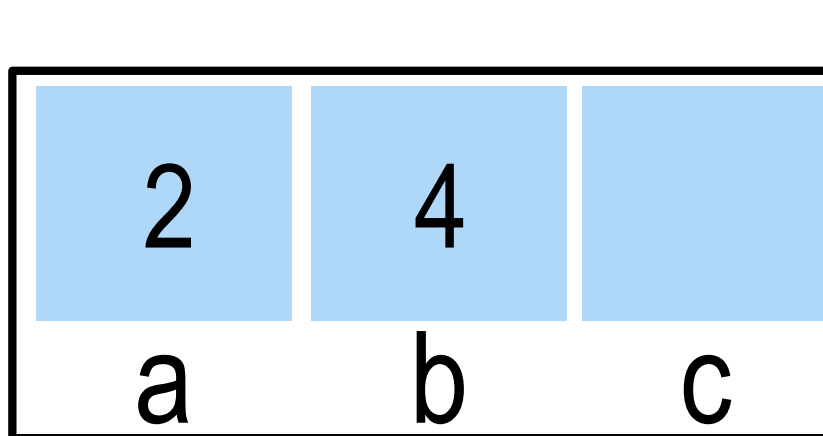
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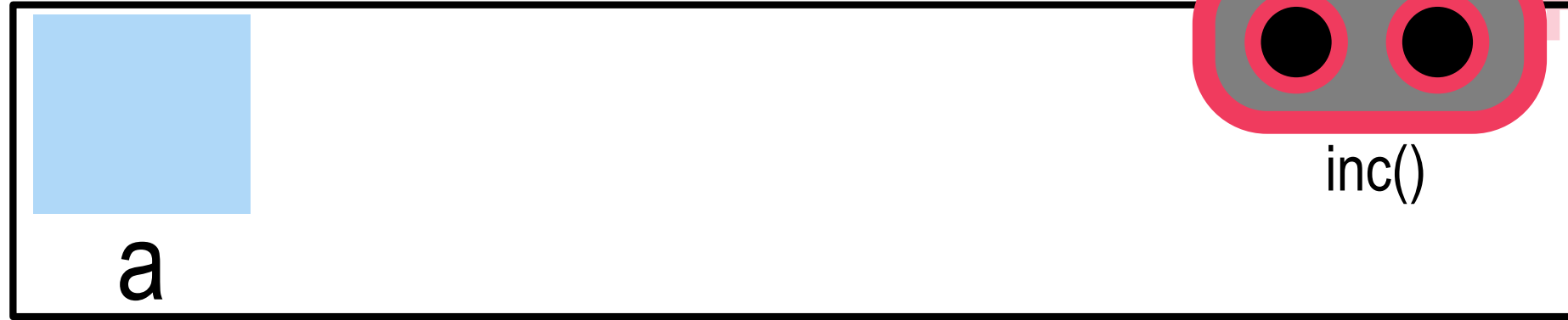


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int main(void){  
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    c = sum(a, b);  
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    return 0;  
}
```

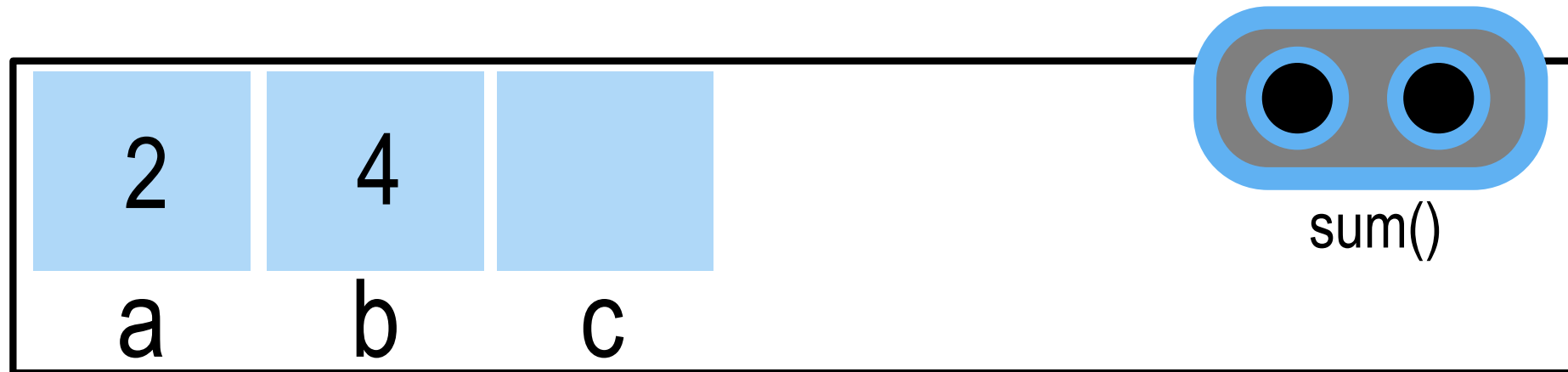


Same function called repeatedly

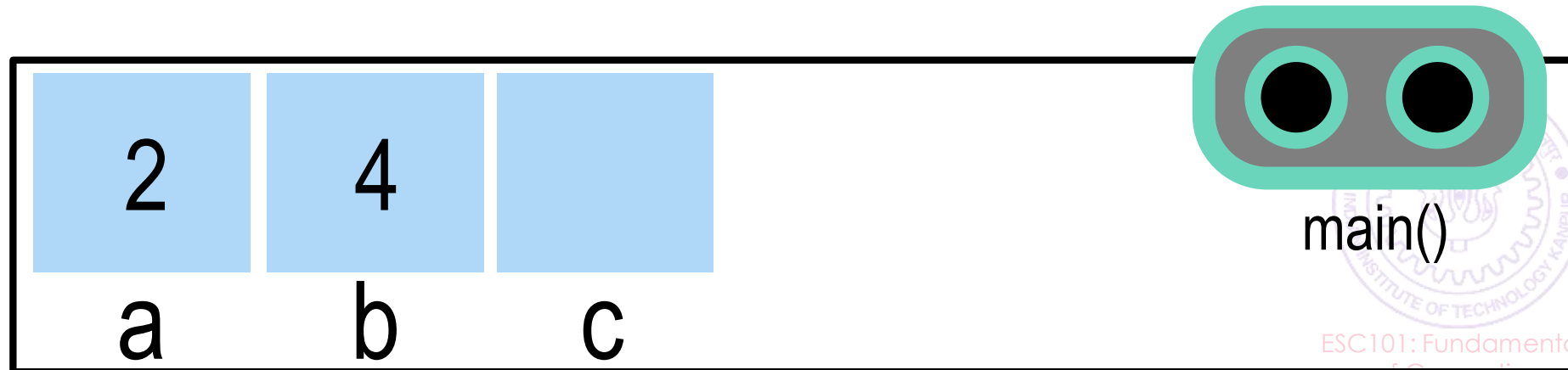
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int inc(int a){  
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int sum(int a, int b){  
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```

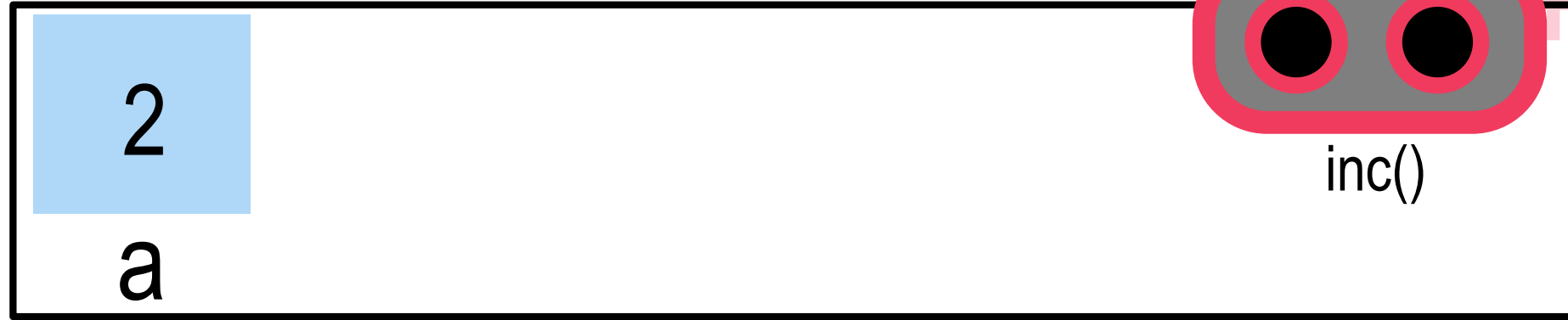


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    return 0;  
}
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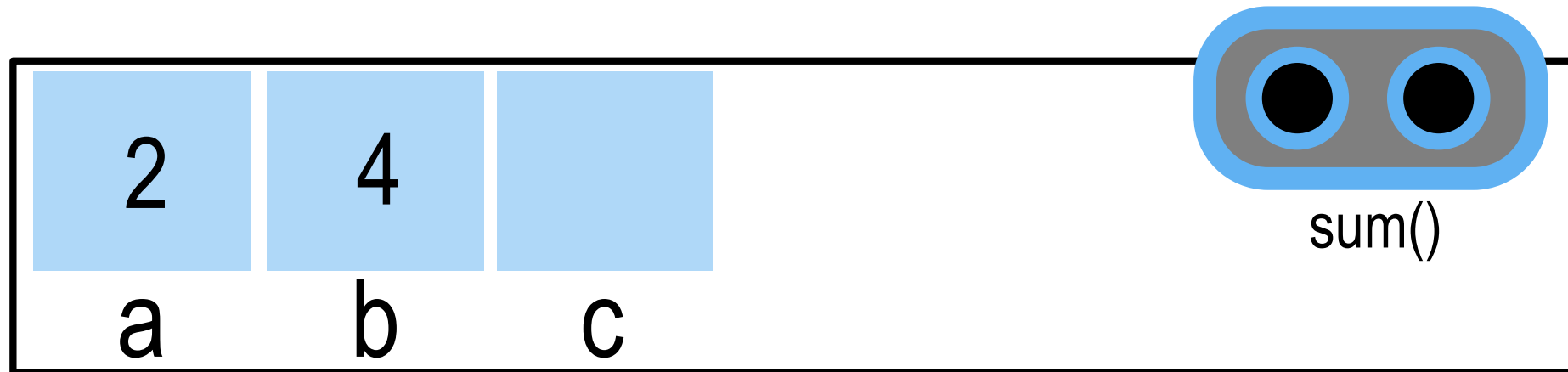


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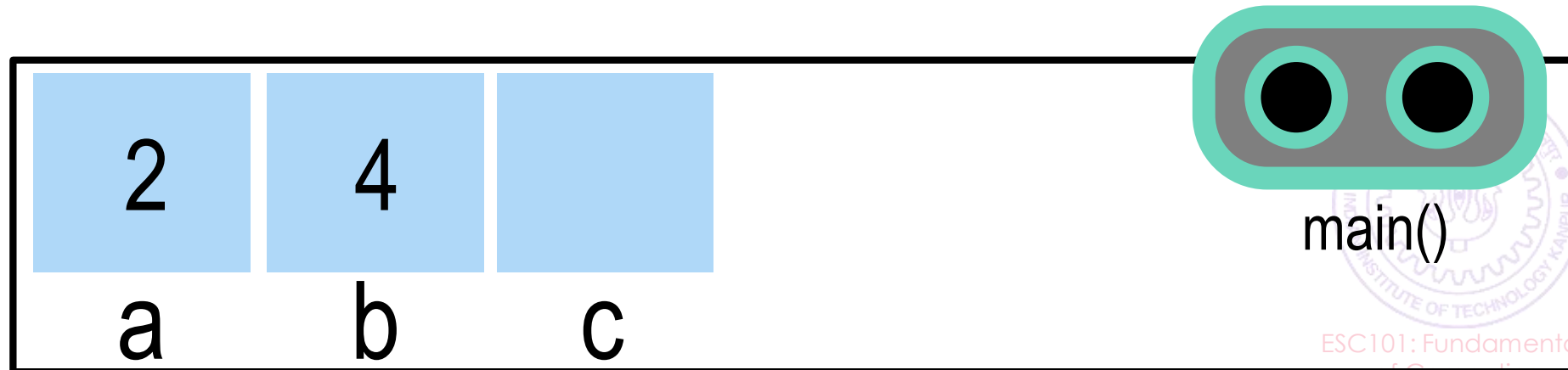
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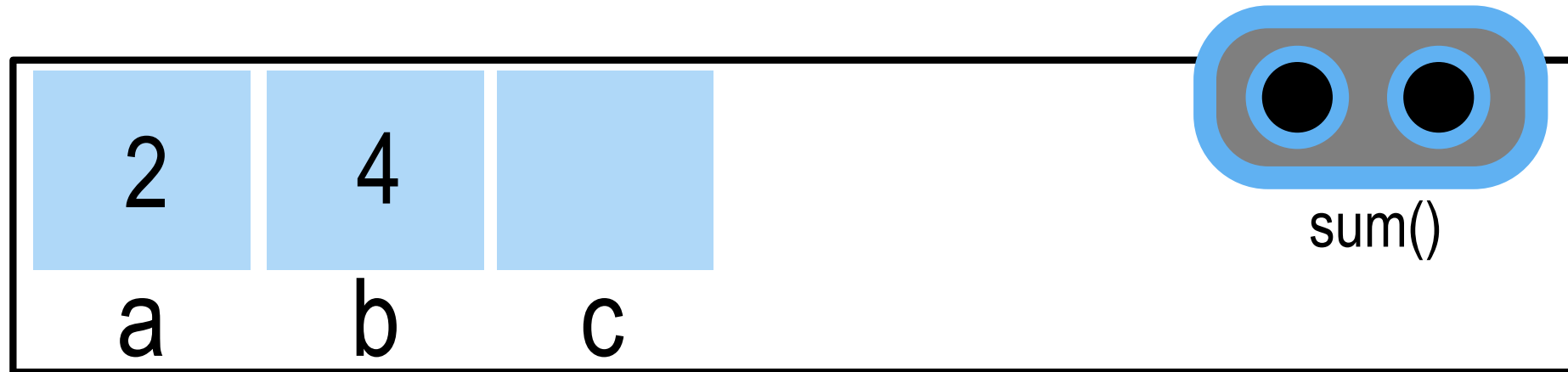


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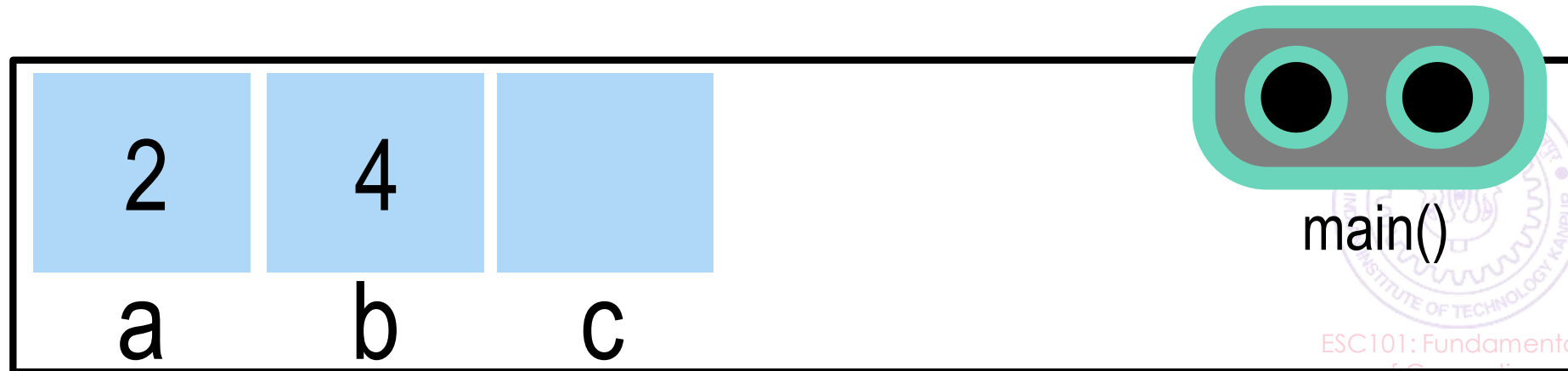
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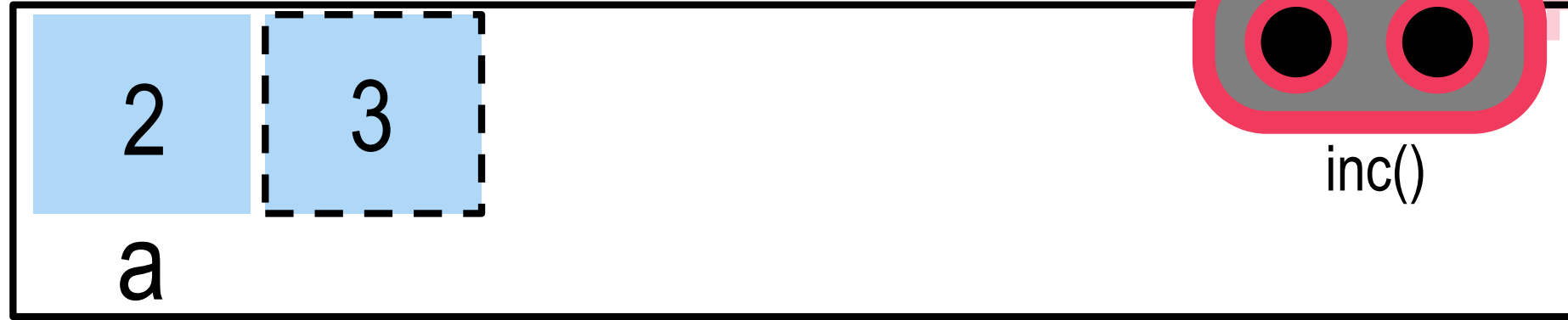


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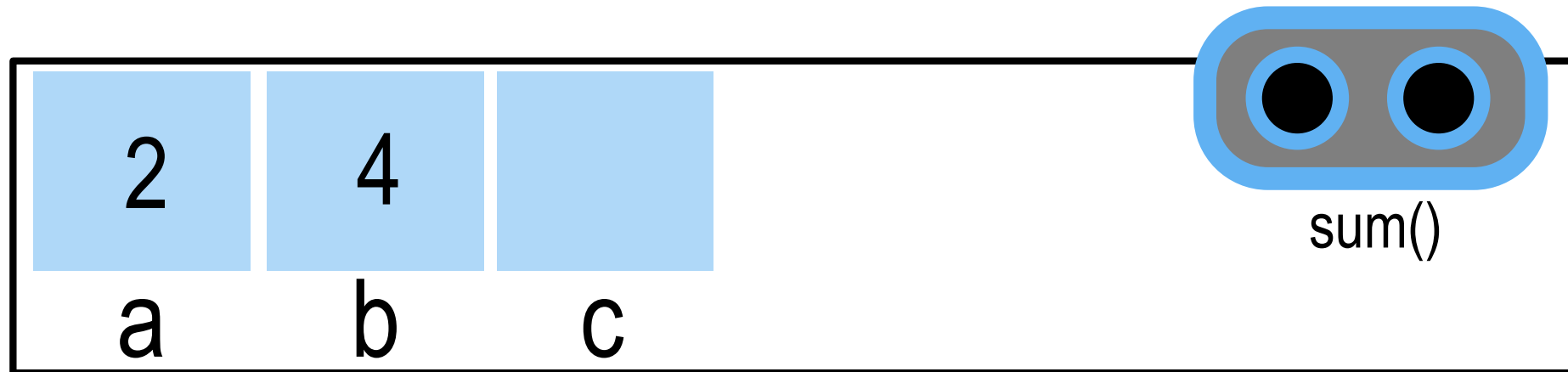


Same function called repeatedly

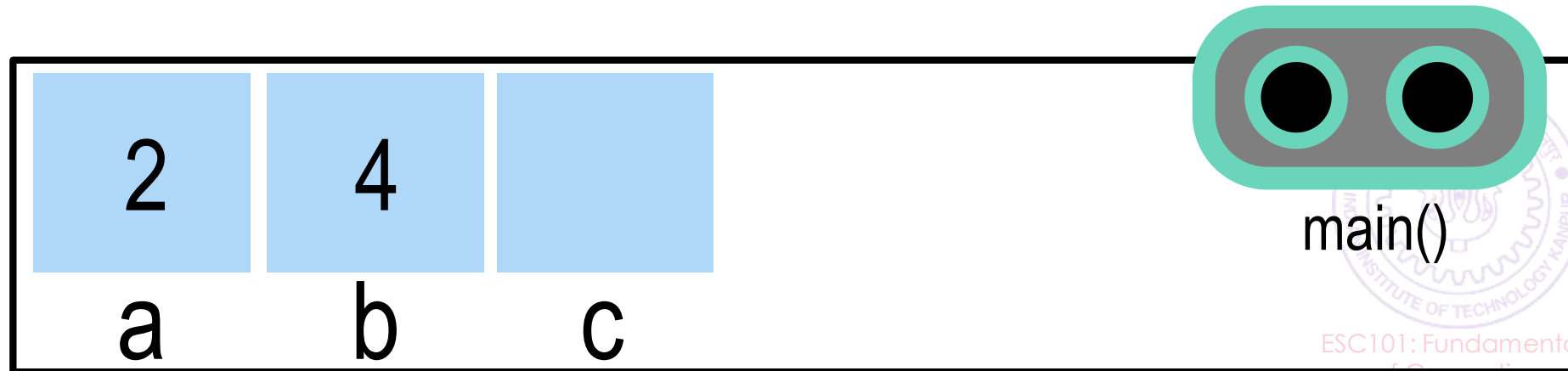
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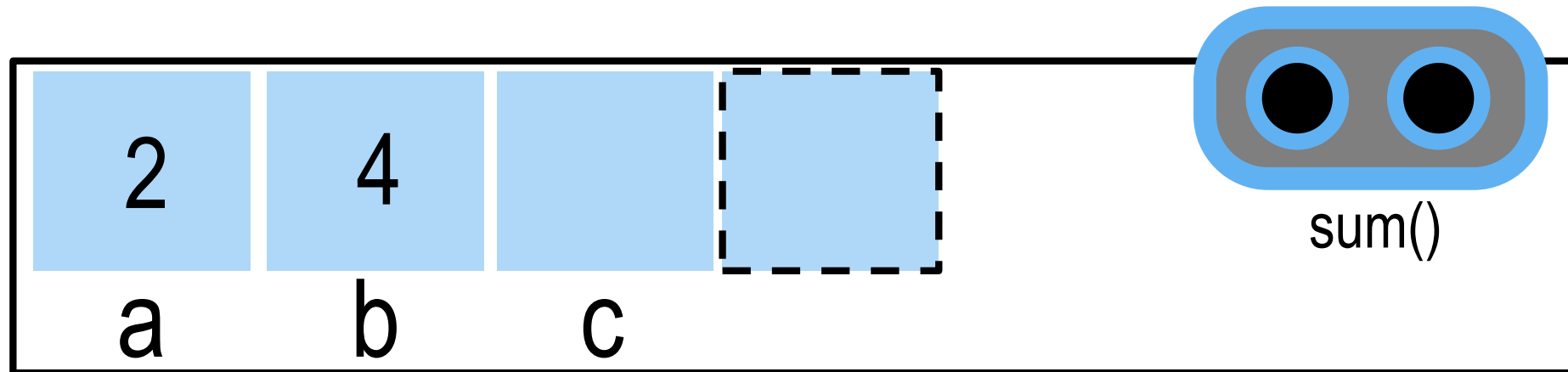


Same function called repeatedly

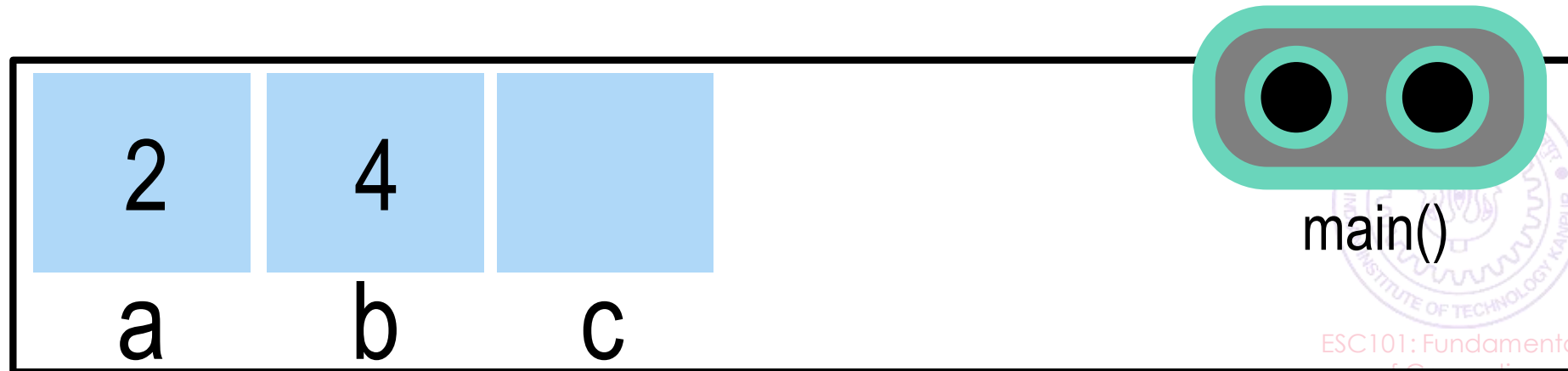
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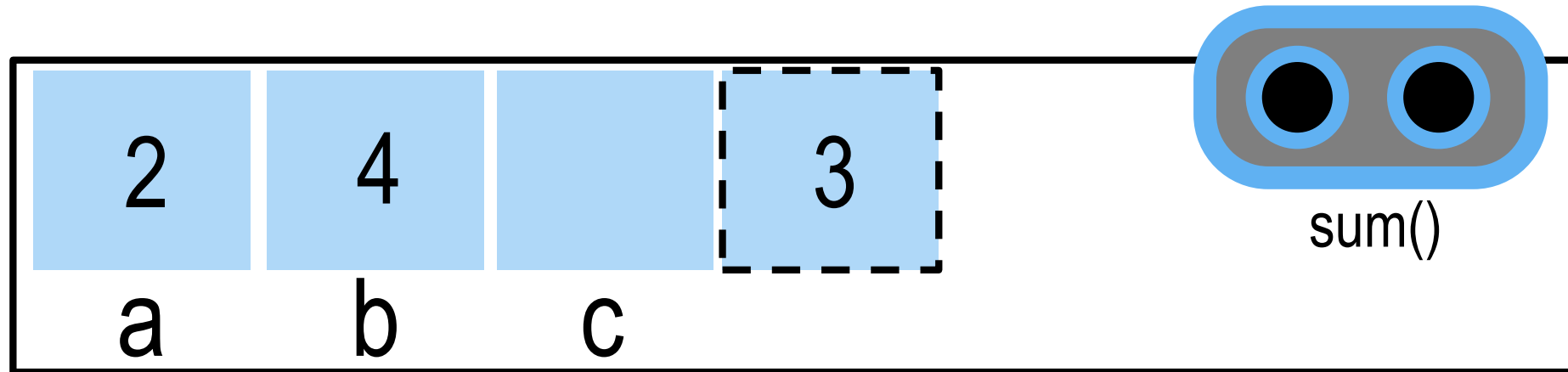


Same function called repeatedly

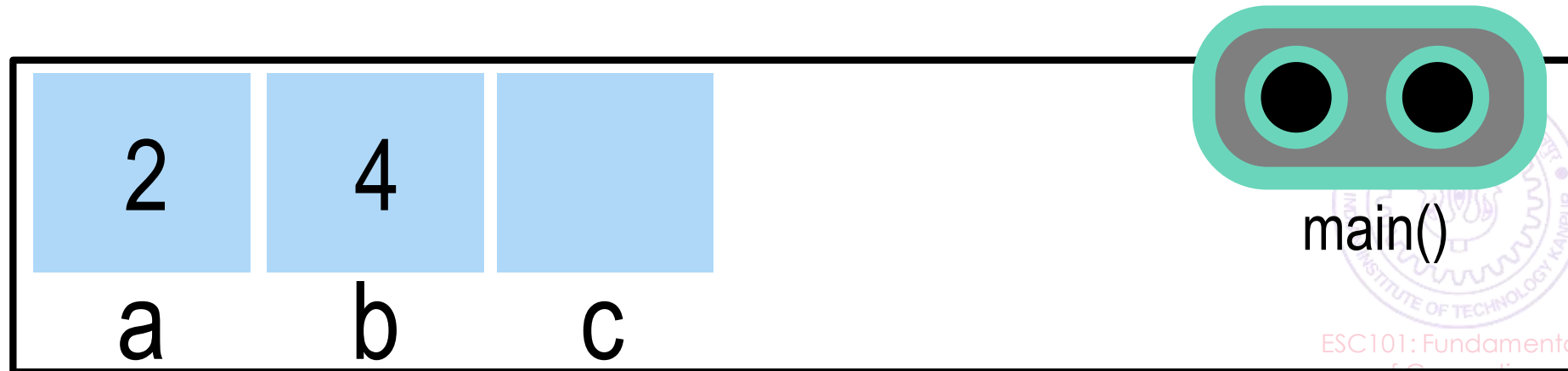
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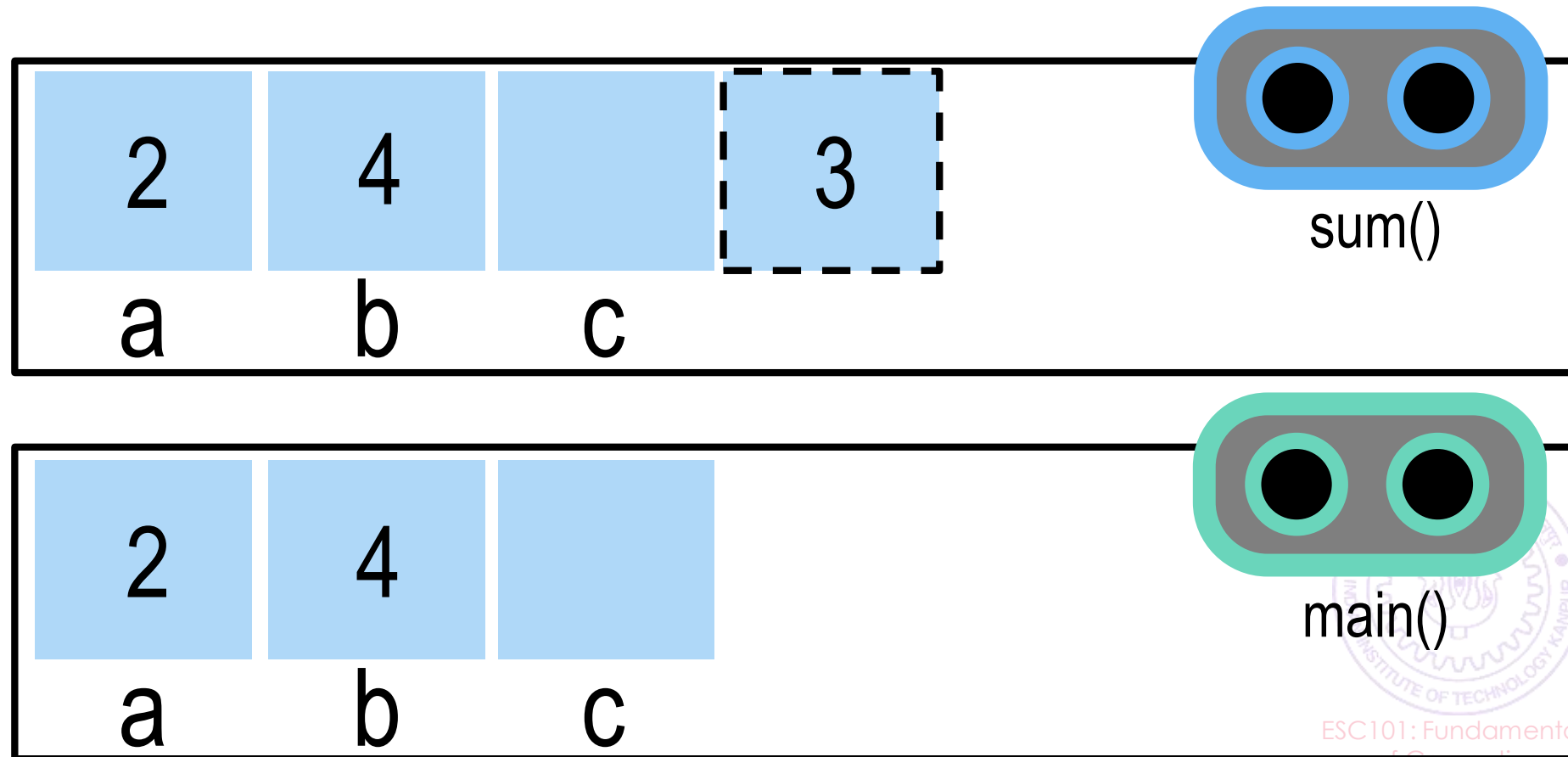
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    c = sum(a, b);  
    printf("%d", c);  
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}
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Same function called repeatedly

4

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int inc(int a){  
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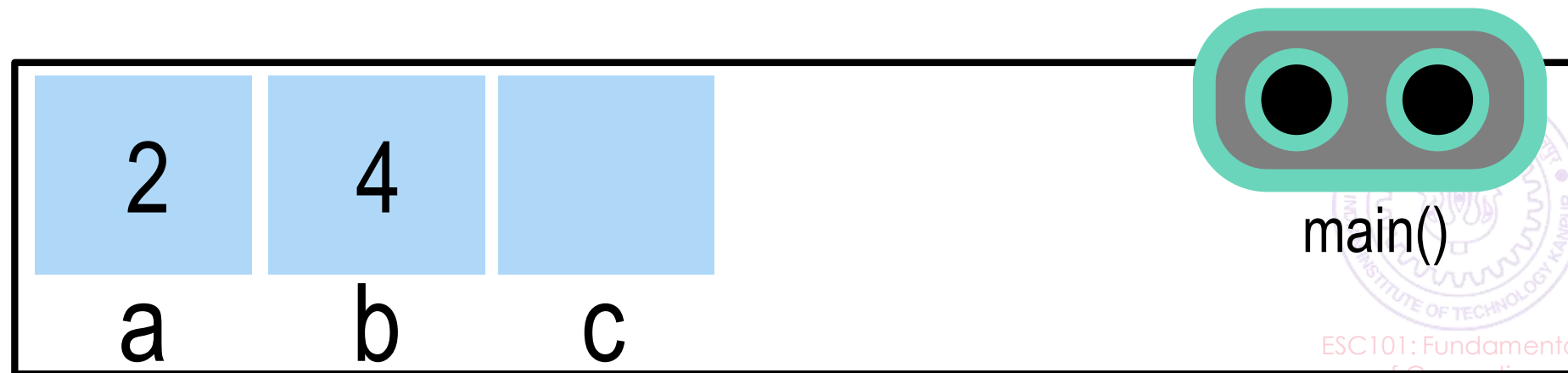
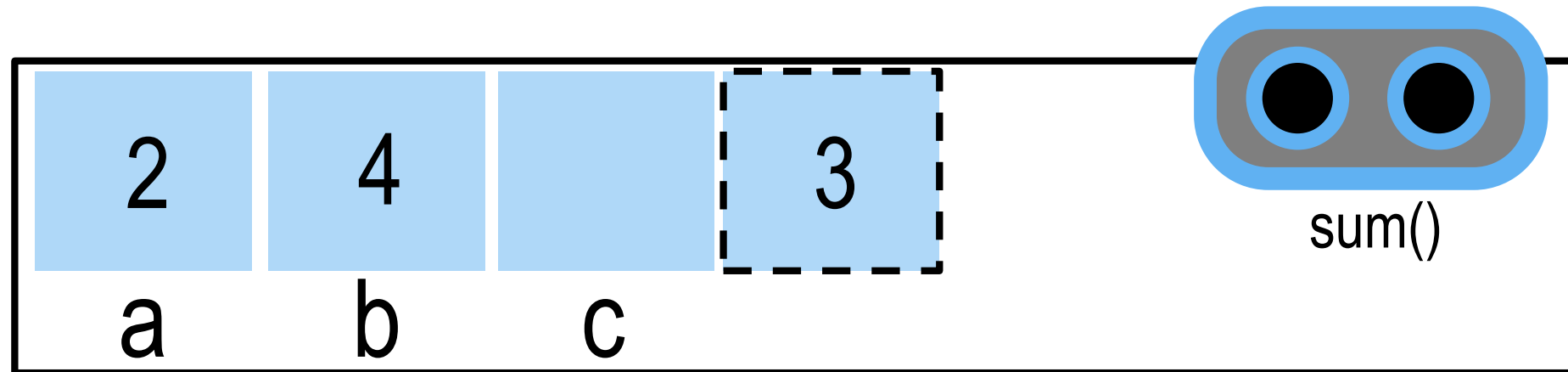
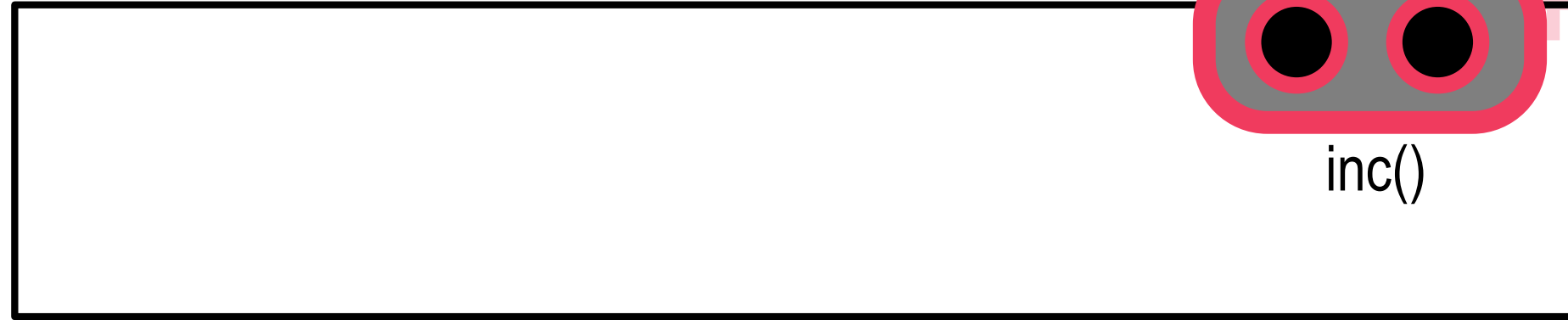


Same function called repeatedly

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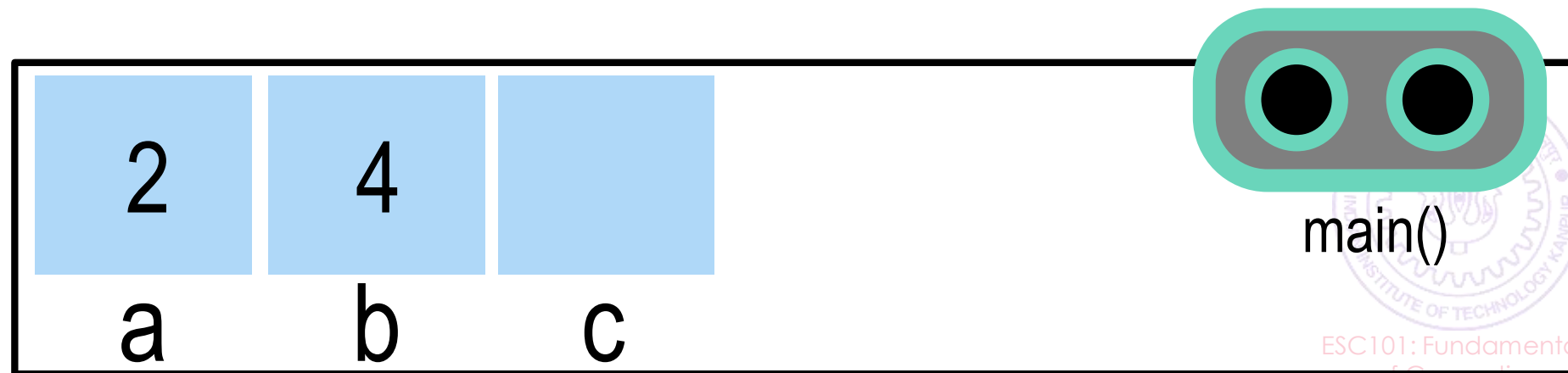
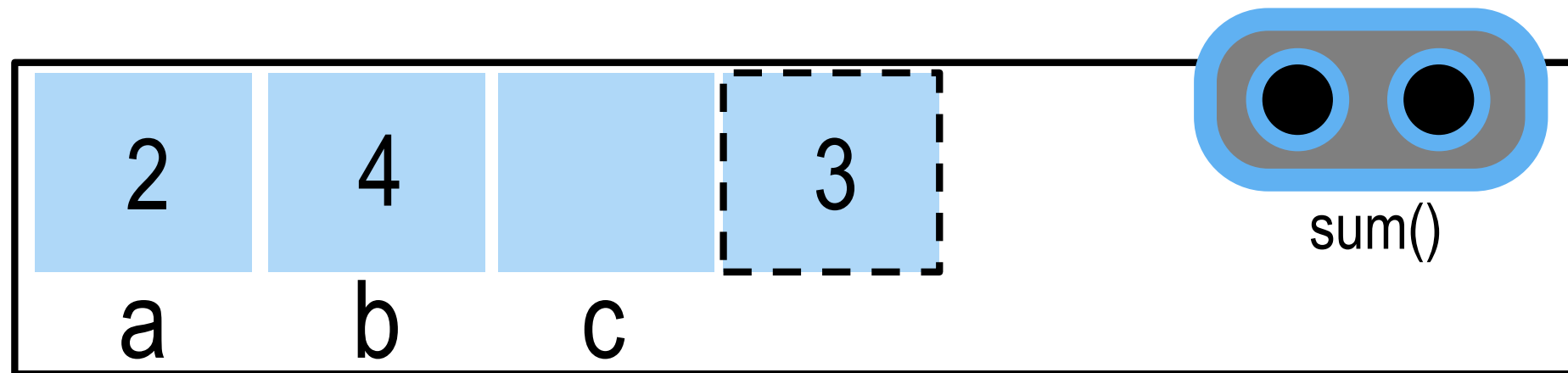
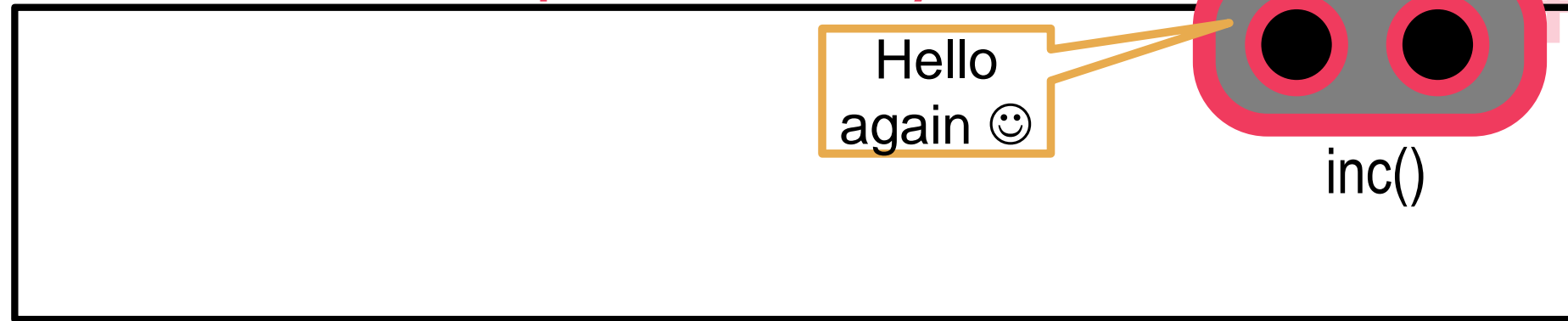


Same function called repeatedly

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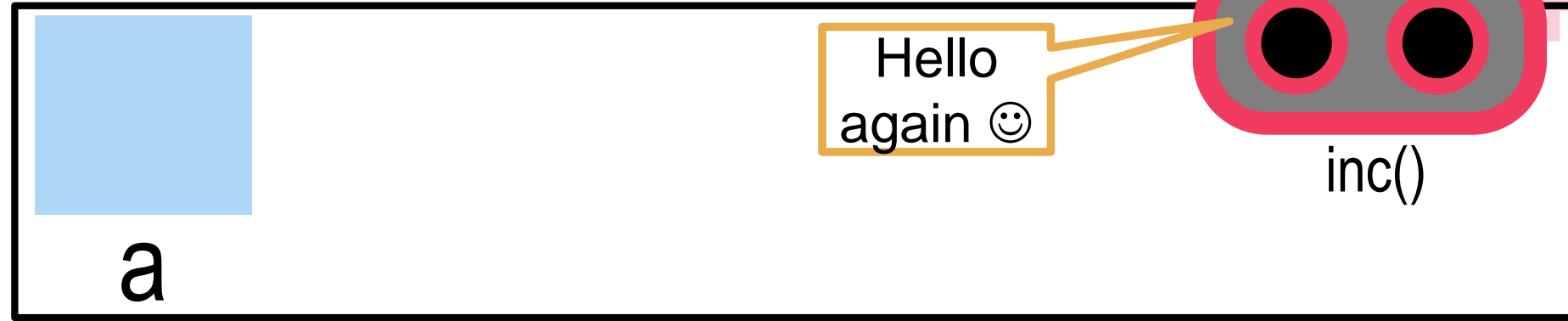
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    return 0;  
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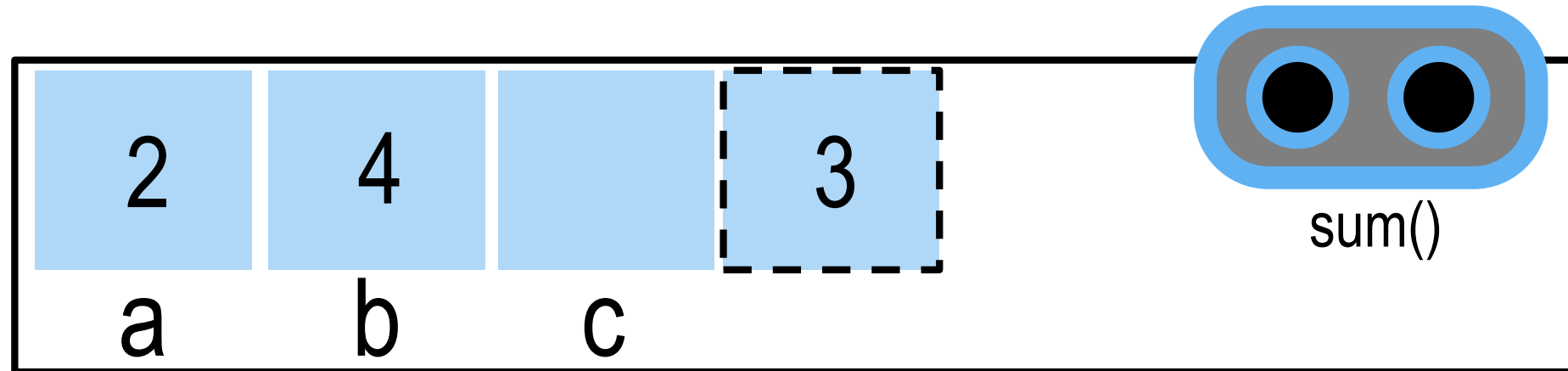


Same function called repeatedly

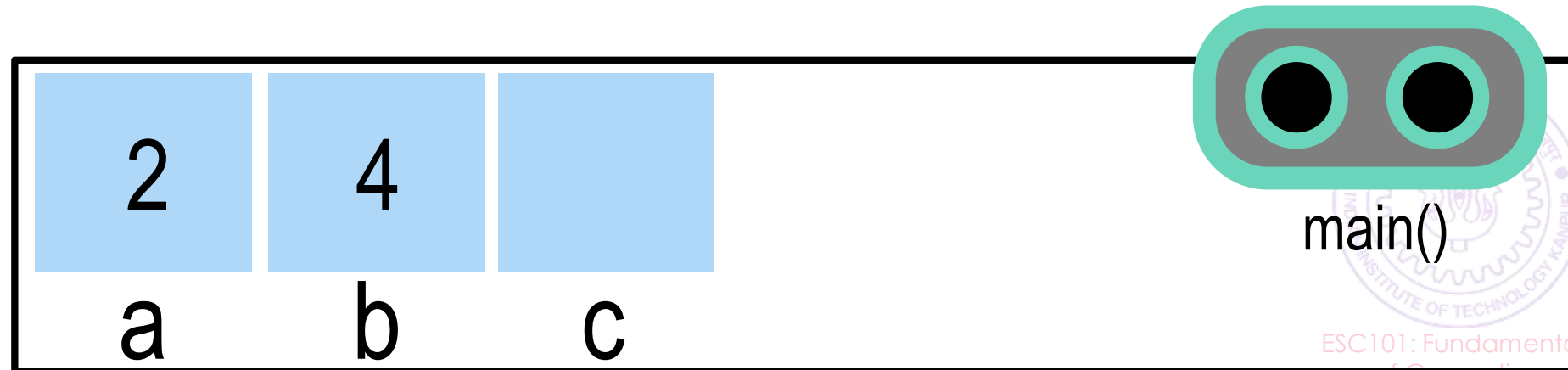
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    int c = inc(a) + inc(b);  
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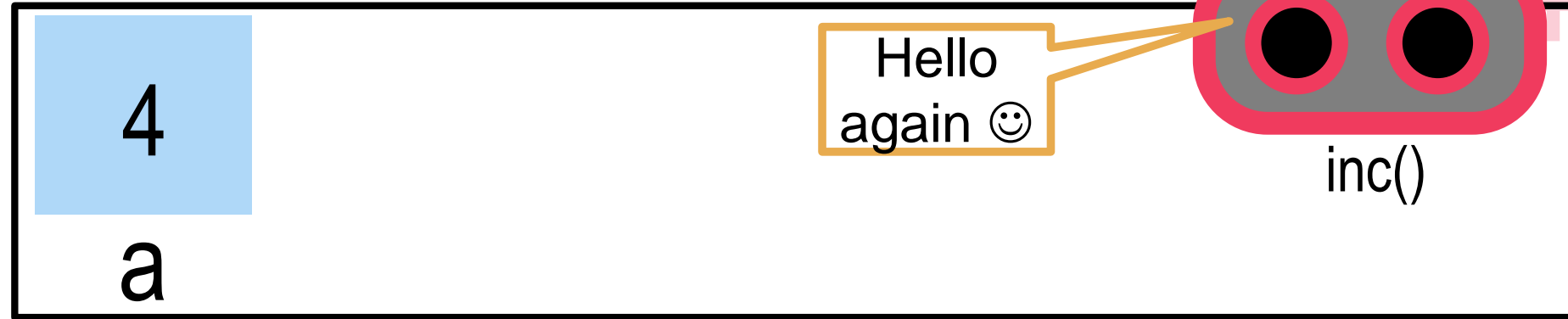


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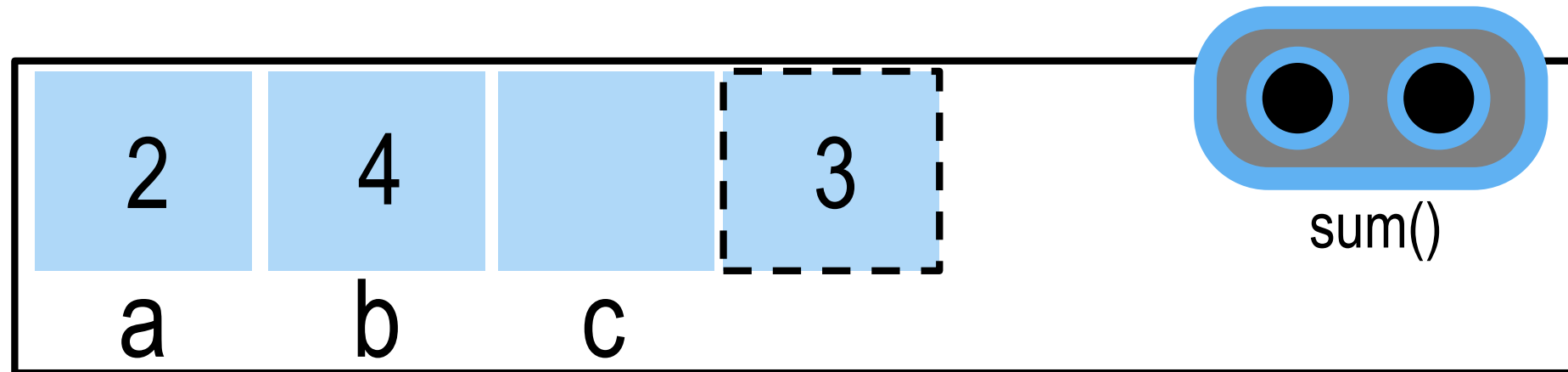


Same function called repeatedly

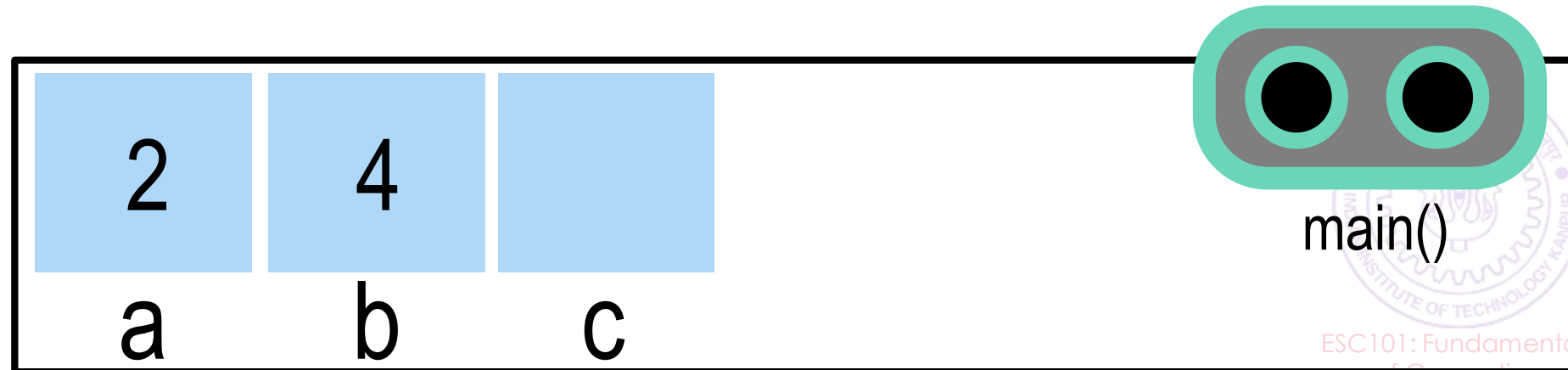
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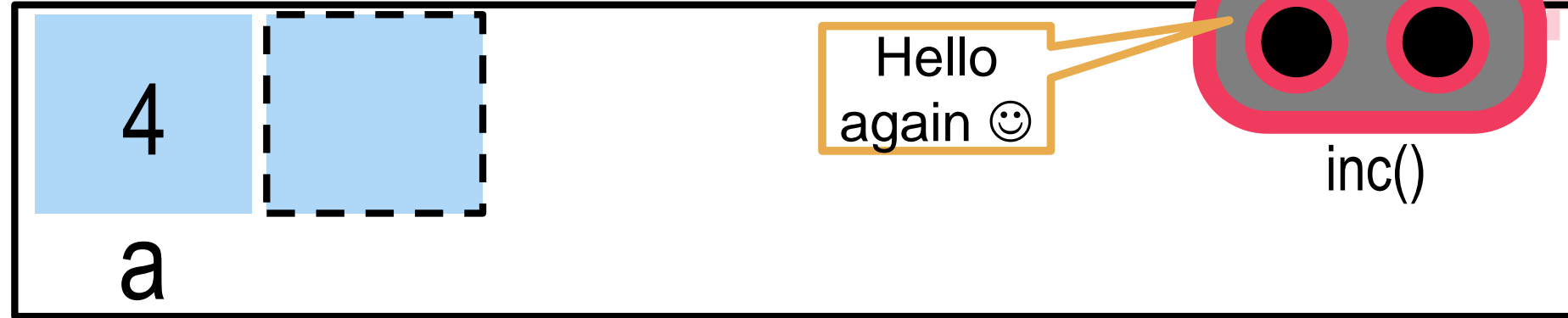


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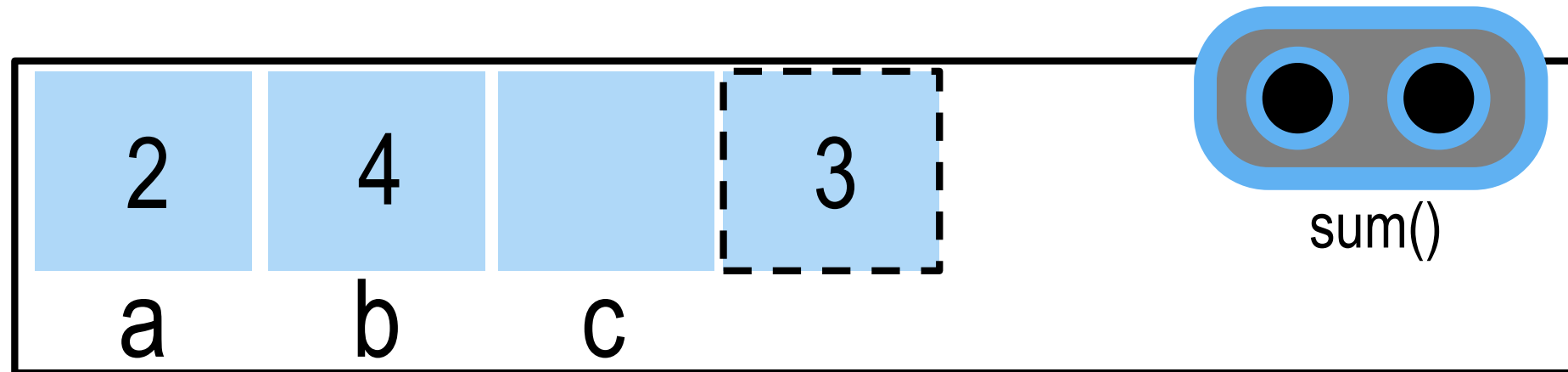


Same function called repeatedly

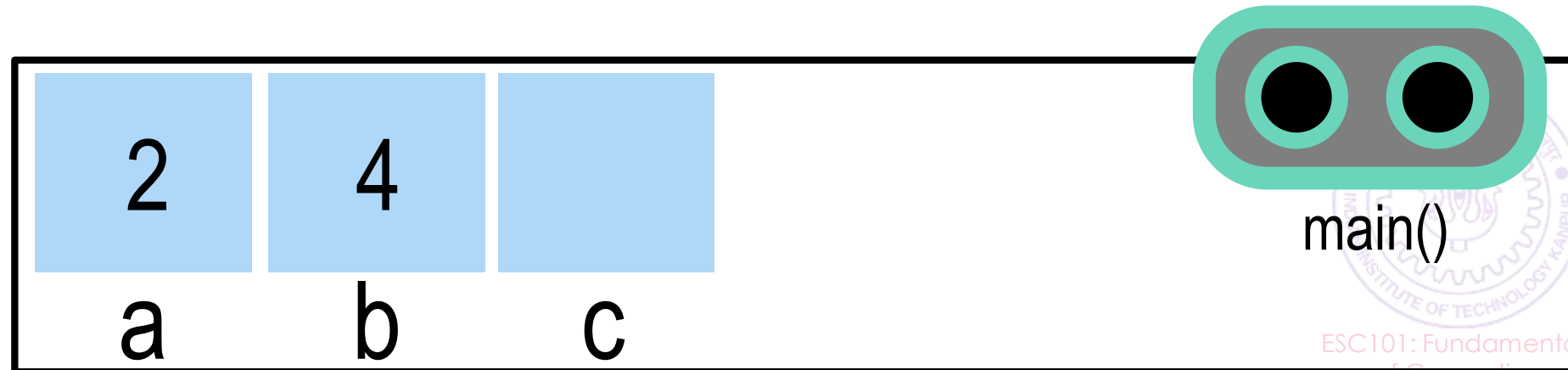
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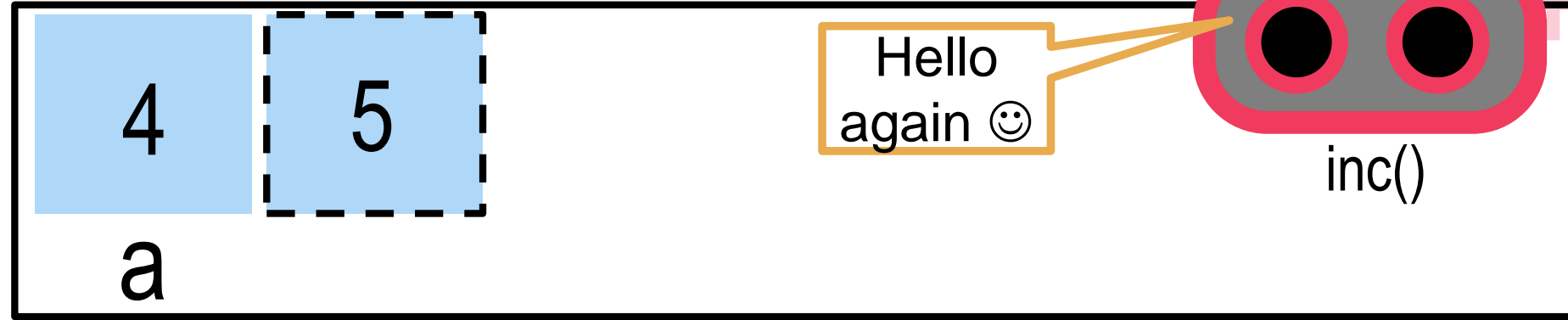


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    return 0;  
}
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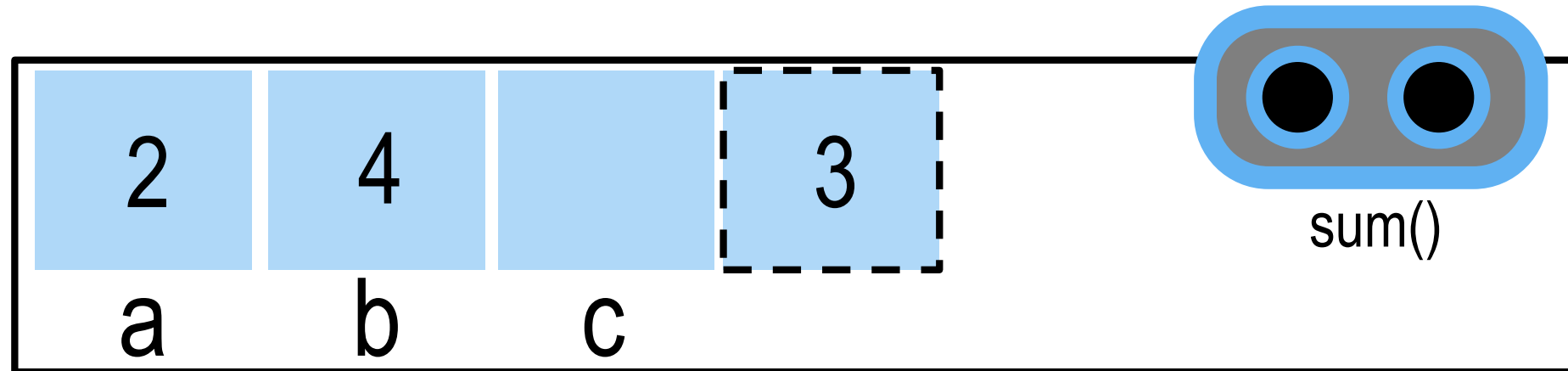


Same function called repeatedly

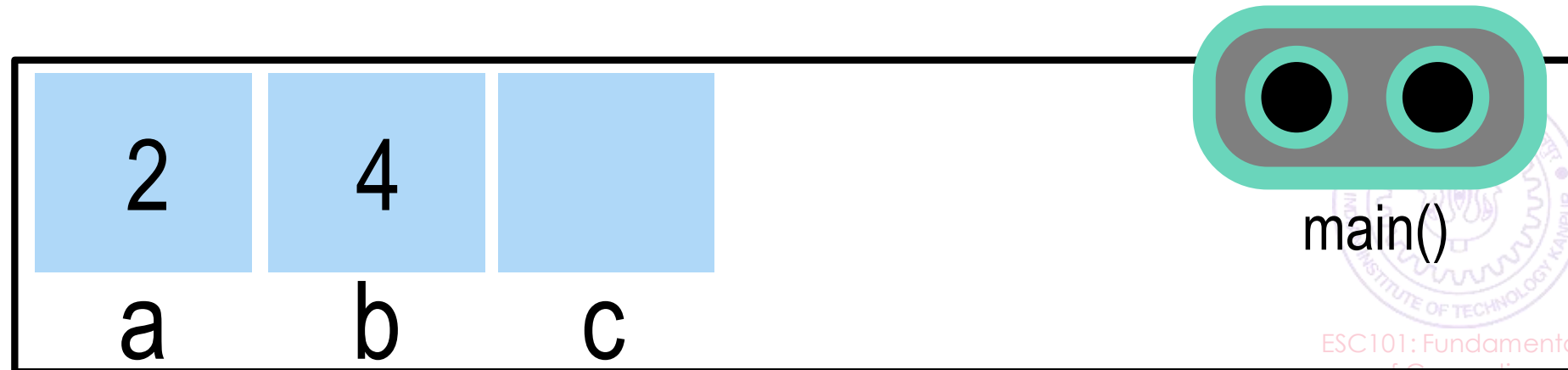
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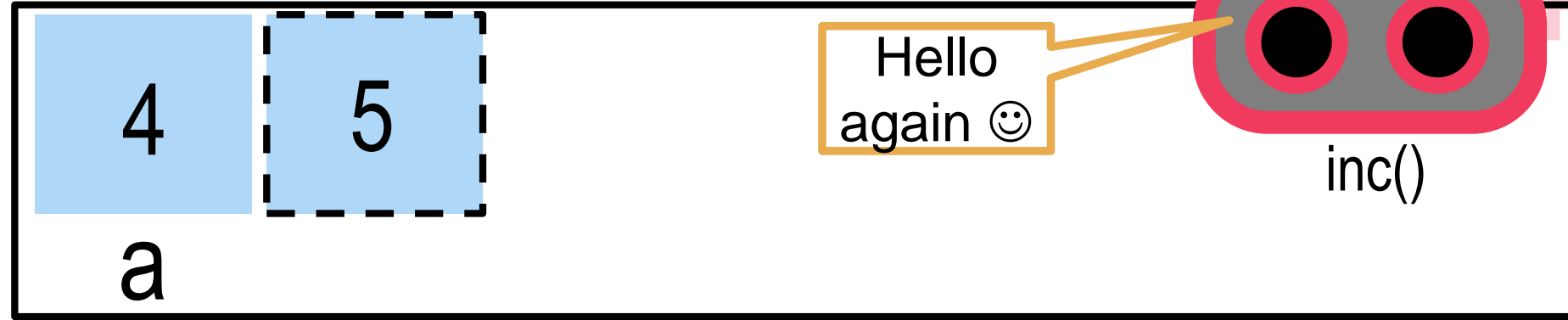


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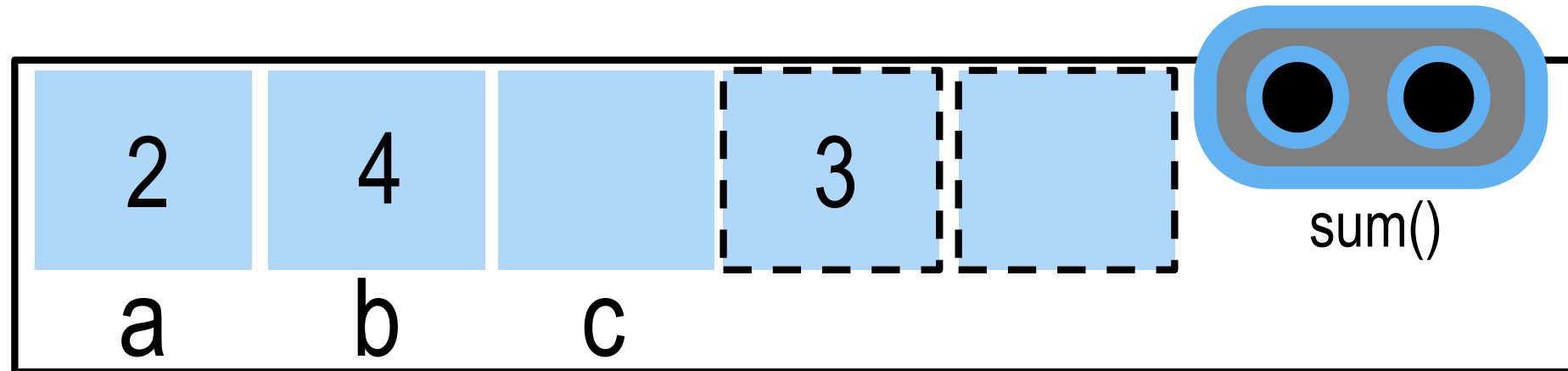


Same function called repeatedly

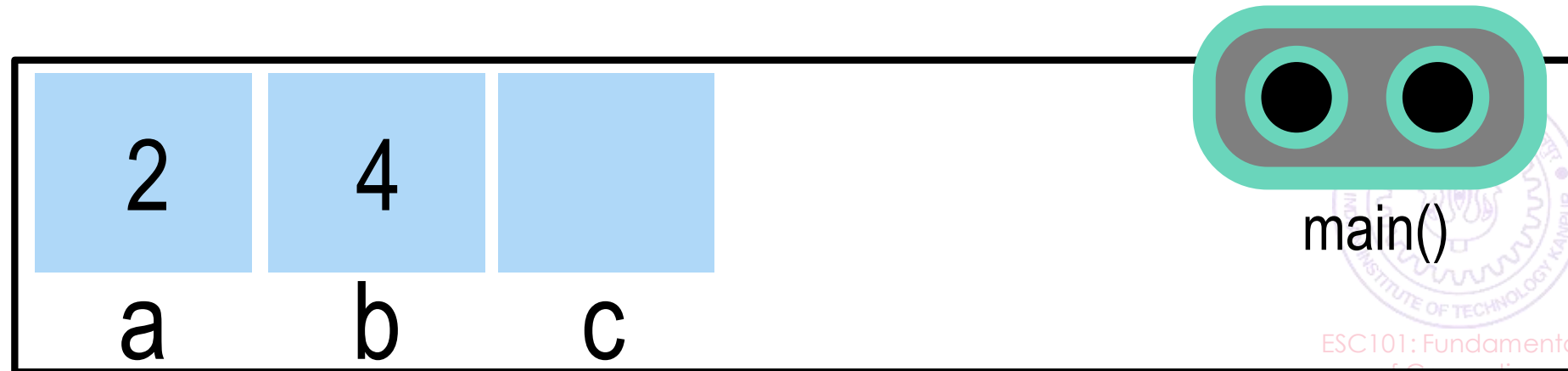
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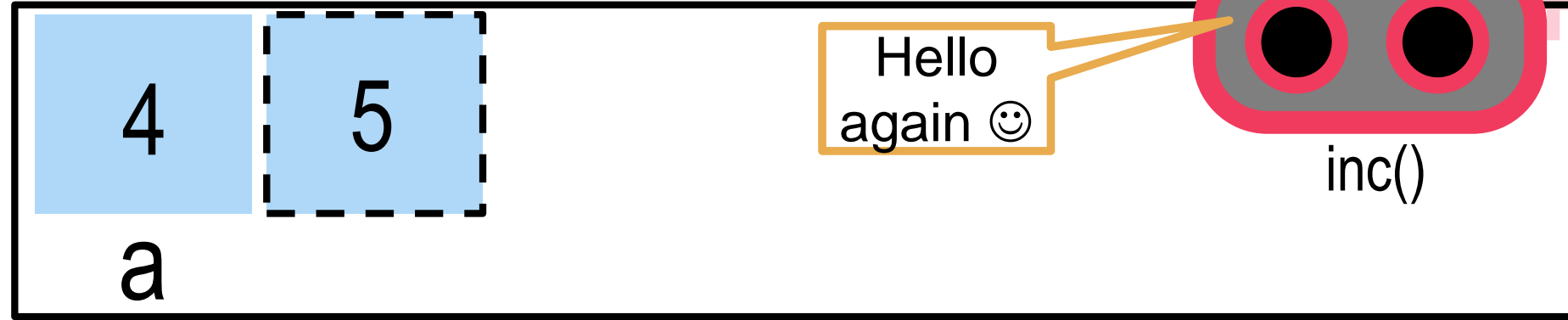


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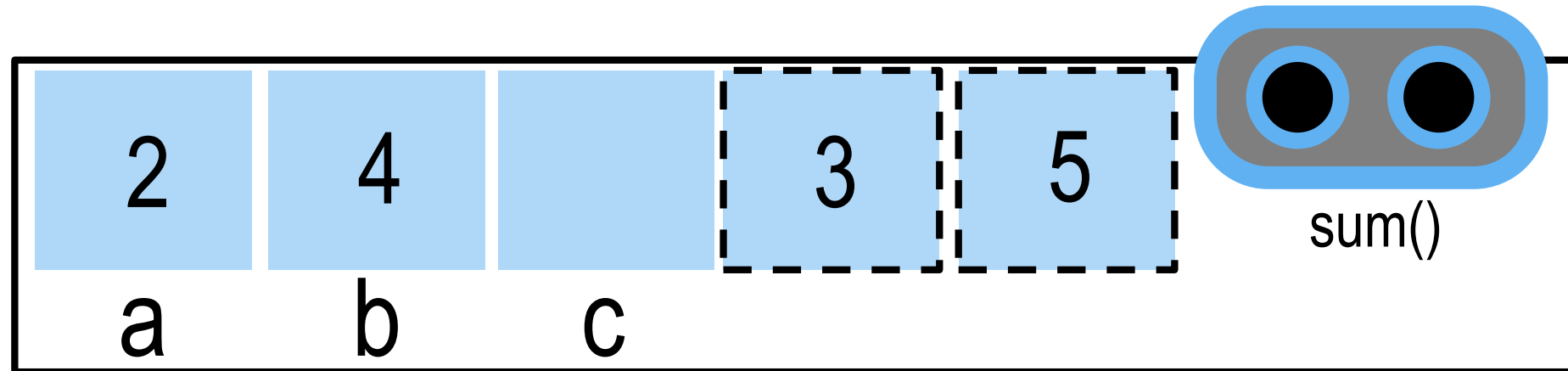


Same function called repeatedly

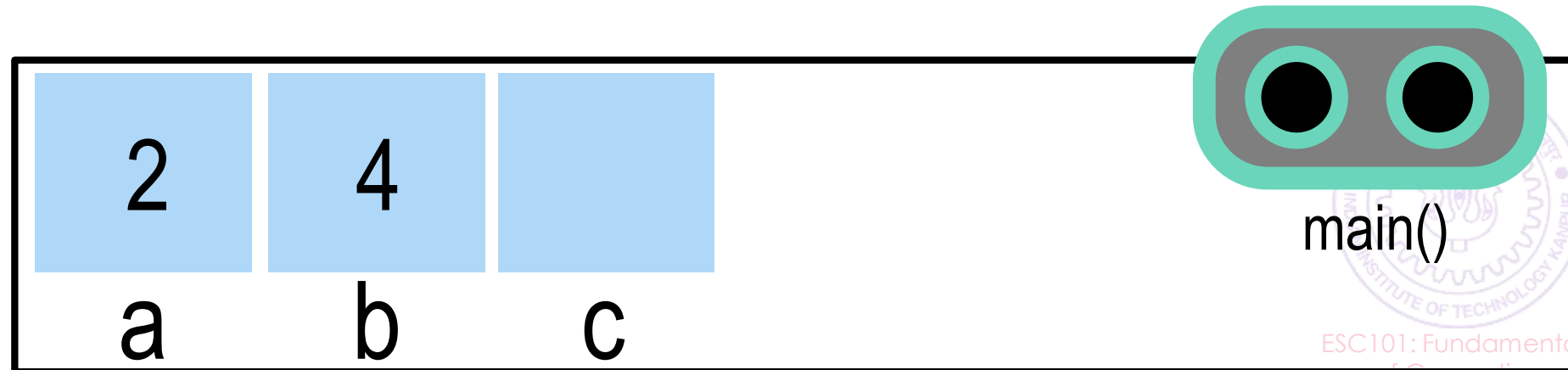
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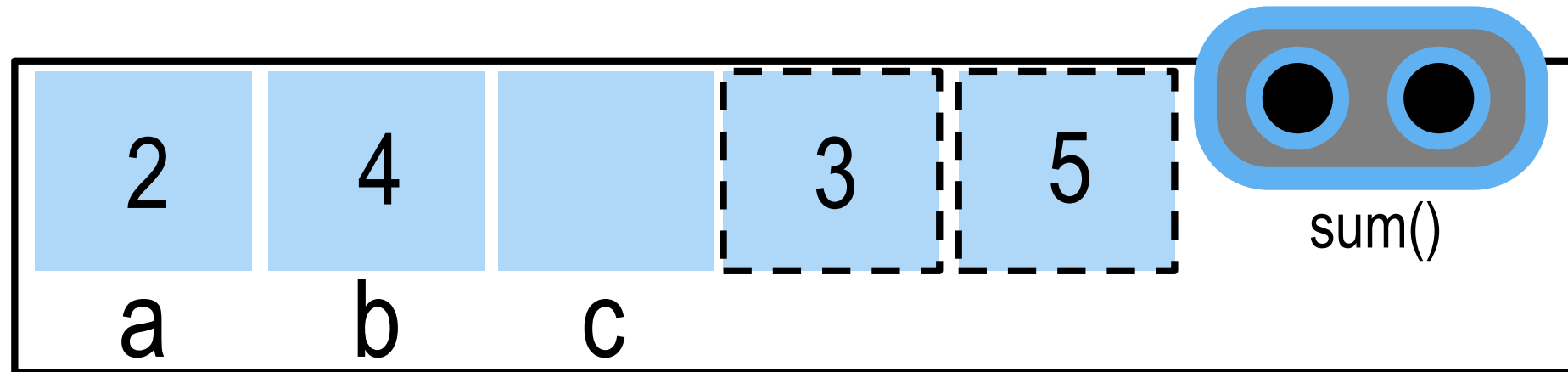


Same function called repeatedly

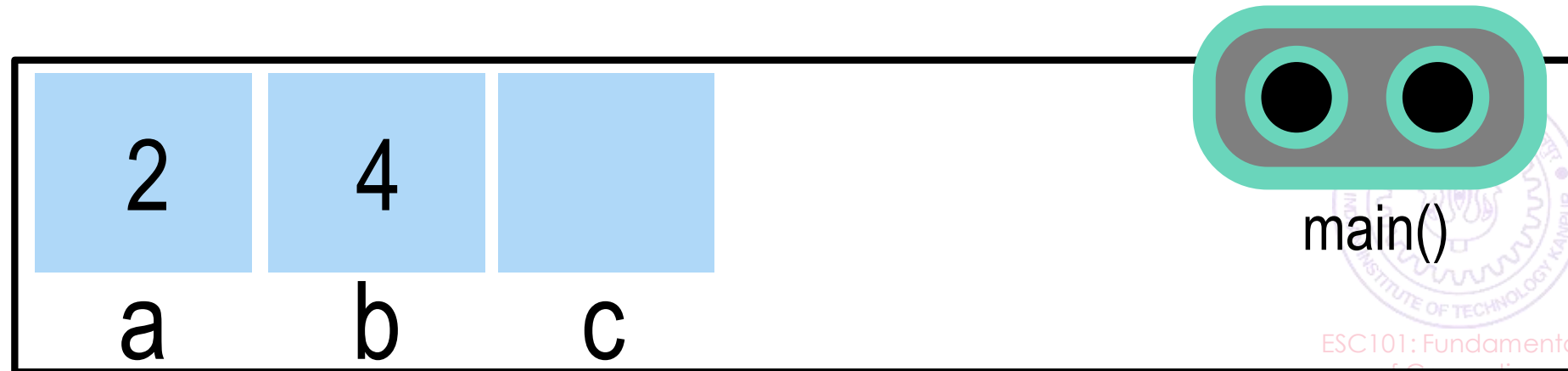
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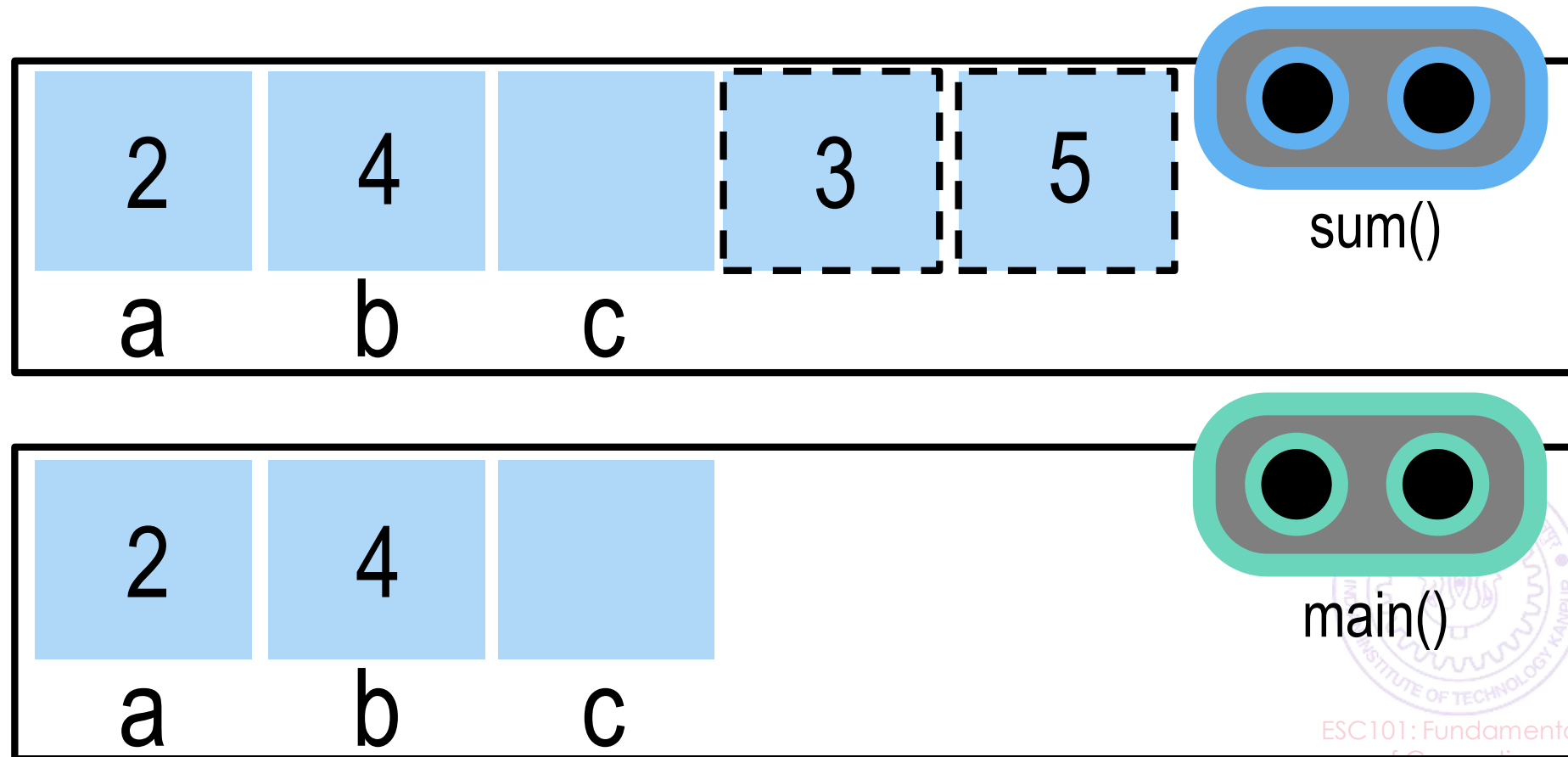
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4

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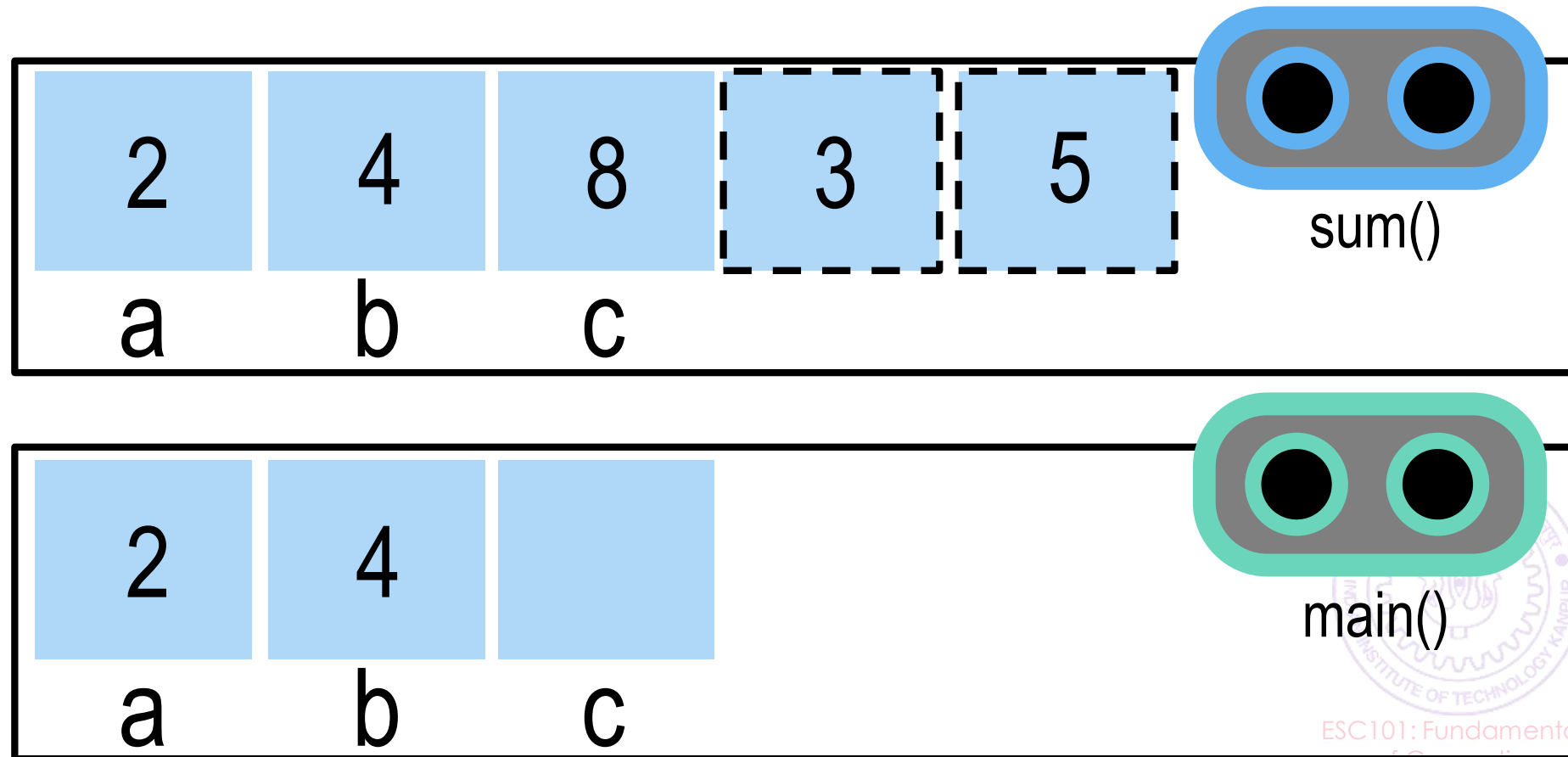
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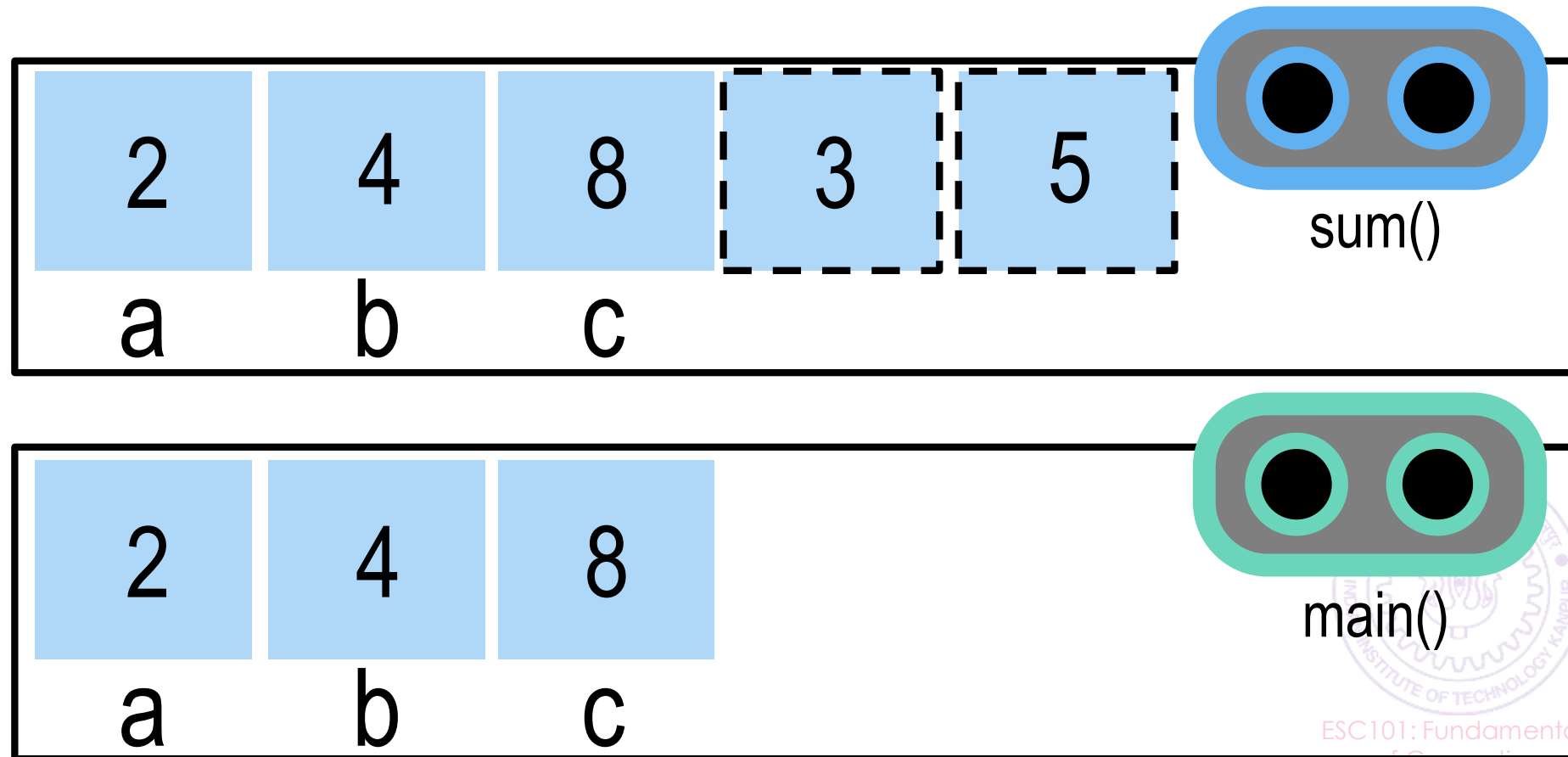
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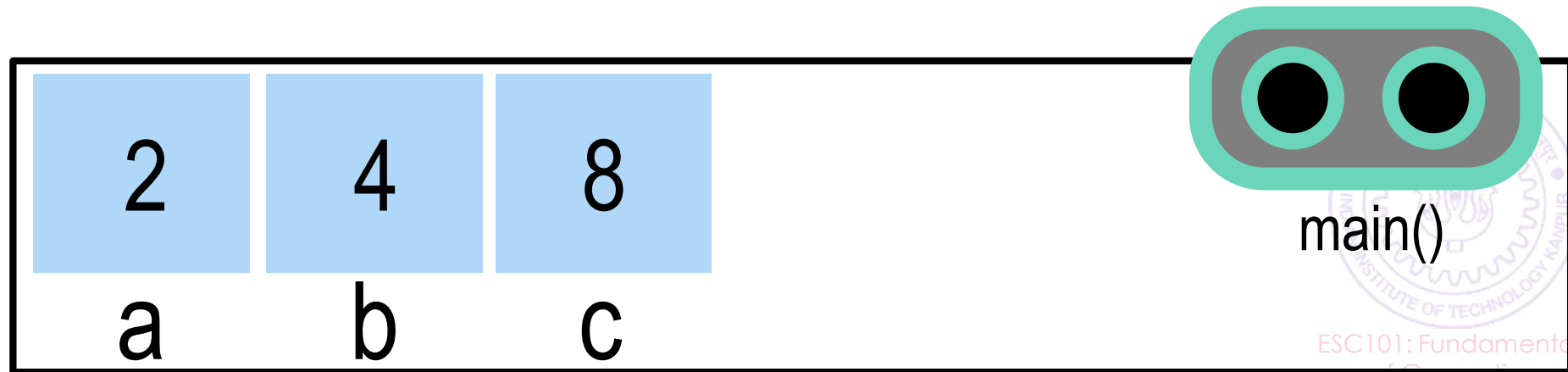
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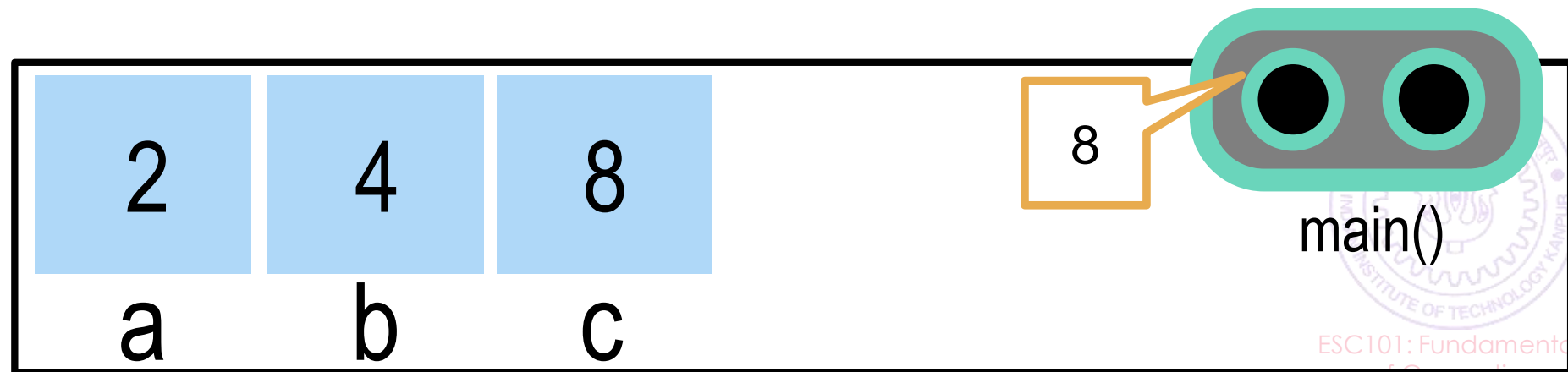
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The 4 Golden Rules of Functions

5



The 4 Golden Rules of Functions

5

RULE 1: When we give a variable as input, the value stored inside that variable gets passed as an argument



The 4 Golden Rules of Functions

5

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Does not matter whether that variable is char, long, double or pointer



The 4 Golden Rules of Functions

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RULE 1: When we give a variable as input, the value stored inside that variable gets passed as an argument

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If that variable is a pointer, address stored inside that pointer passed



The 4 Golden Rules of Functions

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Nothing new here – simply apply rule 1 of pointers



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RULE 2: When we give an expression as input, the value generated by that expression gets passed as argument



The 4 Golden Rules of Functions

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The 4 Golden Rules of Functions

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The 4 Golden Rules of Functions

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The 4 Golden Rules of Functions

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RULE 2: When we give an expression as input, the value generated by that expression gets passed as argument

Does not matter whether the value is a char, long, double or an address

If we pass &a as input where a is a variable, address of a is passed

Nothing new here – simply apply rule 2 of pointers

Rule 2 of pointers: the expression &a generates the address of a as a value



The 4 Golden Rules of Functions

6



The 4 Golden Rules of Functions

6

RULE 3: If there is a mismatch between the type of input passed the type you promised when defining the function



The 4 Golden Rules of Functions

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Mr C will try typecasting – may lose info e.g. float passed when int expected



The 4 Golden Rules of Functions

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Mr C will try typecasting – may lose info e.g. float passed when int expected

We have seen Mr C do this several times in this course



The 4 Golden Rules of Functions

6

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This rule may seem confusing when we are passing pointers to functions but make no mistake – rule 4 ALWAYS applies unless global variables involved



More on Return

7



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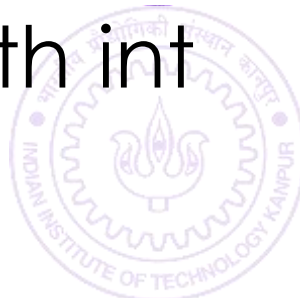
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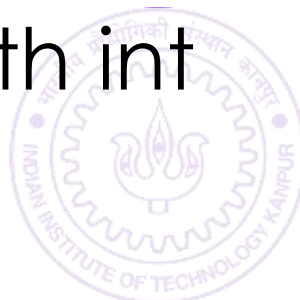
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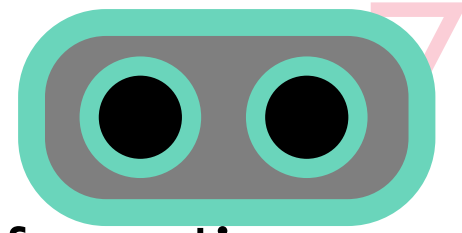
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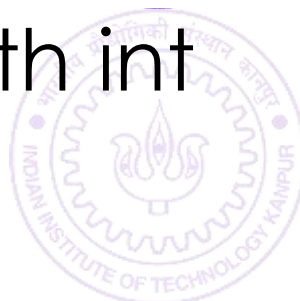
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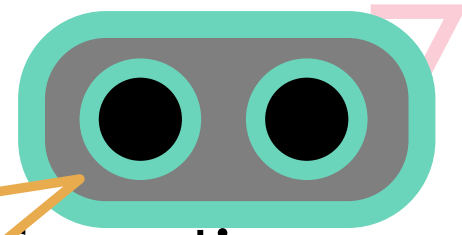
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More on

For functions that do not need to return anything i.e. void return type, you can either say return; or else not write return at all inside the function body in which case the entire body will get executed



May write return; at the end of the function

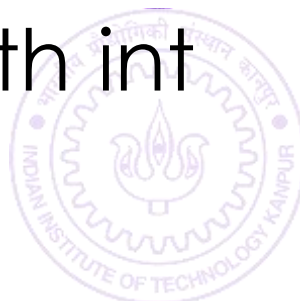
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More on Return

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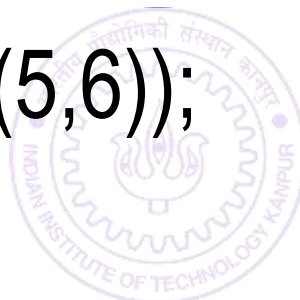
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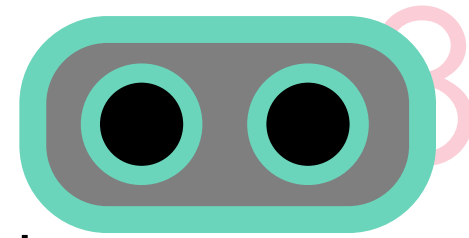
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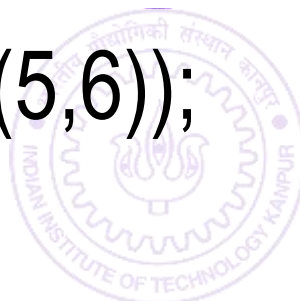
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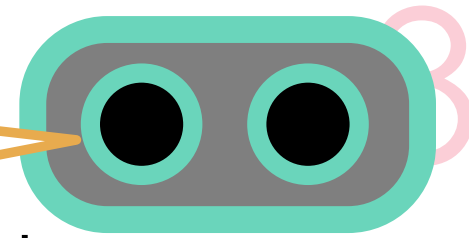
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More on Return

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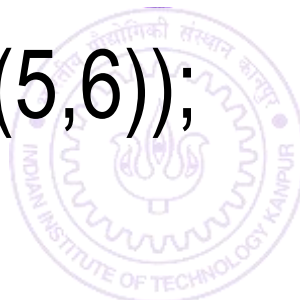
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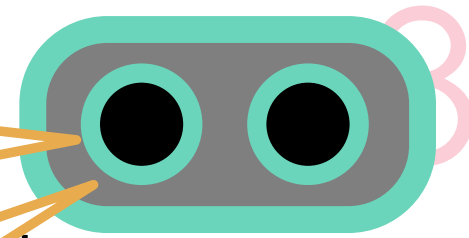
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The value that is returned by main() is like a reserved function name. Just as a normal variable of any type cannot be named main, a function cannot be named main.

You can freely use returned values in expressions

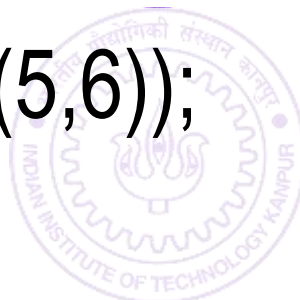
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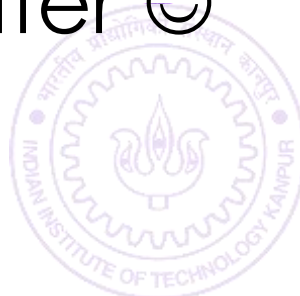
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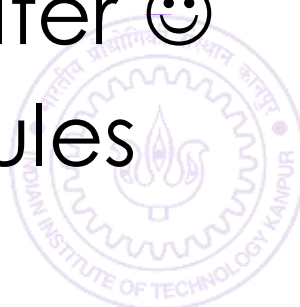
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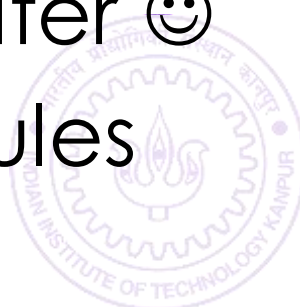
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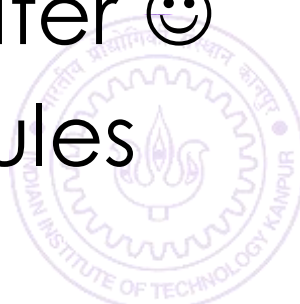
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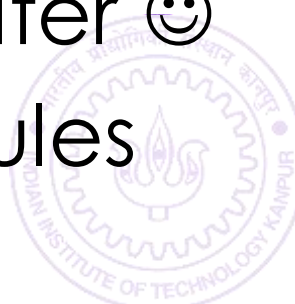
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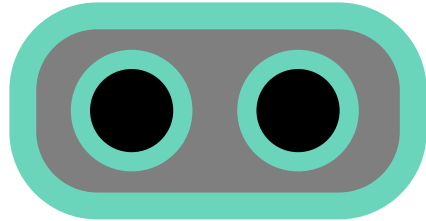
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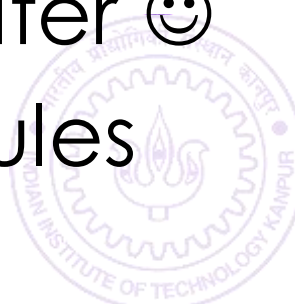
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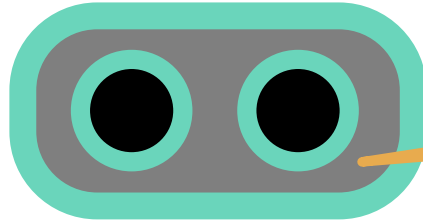
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Writing code that has modules is a type of *modular programming* – it is the the industry standard!

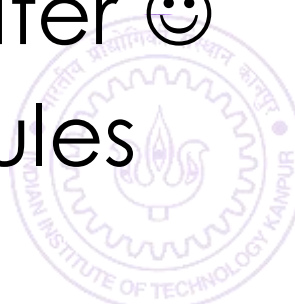
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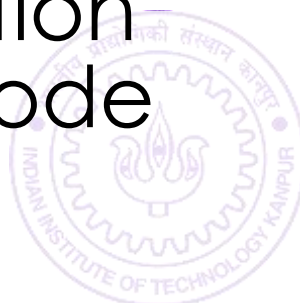
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Rest of code need not be touched, only faulty function needs to be fixed – again the industry standard of code maintenance.



Benefits of writing functions

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Benefits of writing functions

Functions allow you to reuse code



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We reused code in today's codes – didn't have to rewrite code – may make mistakes if you write same code again

