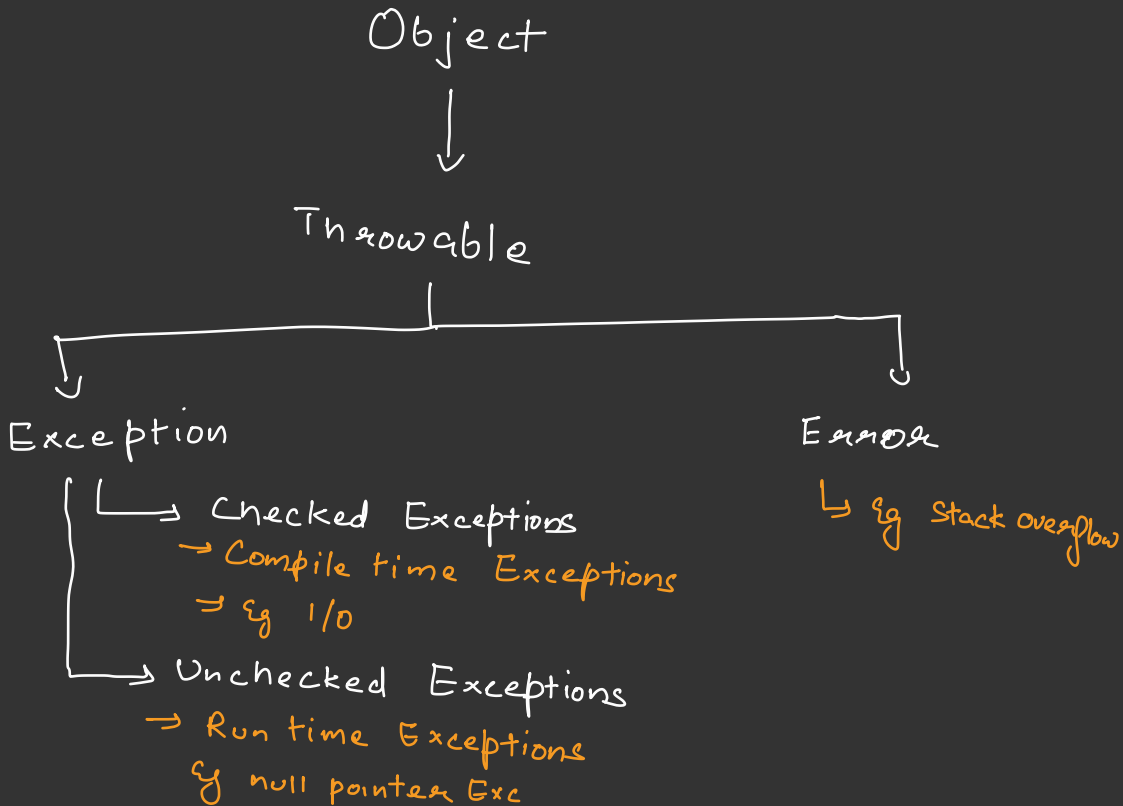# Exception Handling

↳ Unexpected / Unwanted behavior

Errors → Can not be handled by programmer
    ↳ generated by JVM.

Object
↓
Throwable

Exception   Error

↳ Checked Exceptions   ↳ eg Stack overflow
  → Compile time Exceptions
  ⇒ eg I/O
  ↳ Unchecked Exceptions
    ⇒ Run time Exceptions
      & null pointer Exc

name of thread ↲, Name of Exception   Description

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at OOPS.ExceptionHandling.divide(ExceptionHandling.java:6)
        at OOPS.ExceptionHandling.fun(ExceptionHandling.java:11)
        at OOPS.ExceptionHandling.main(ExceptionHandling.java:16)
```

↳ Call Stack

Default Behavior

  ↳ print name and description

  ↳ print call stack

  ↳ Terminate the program

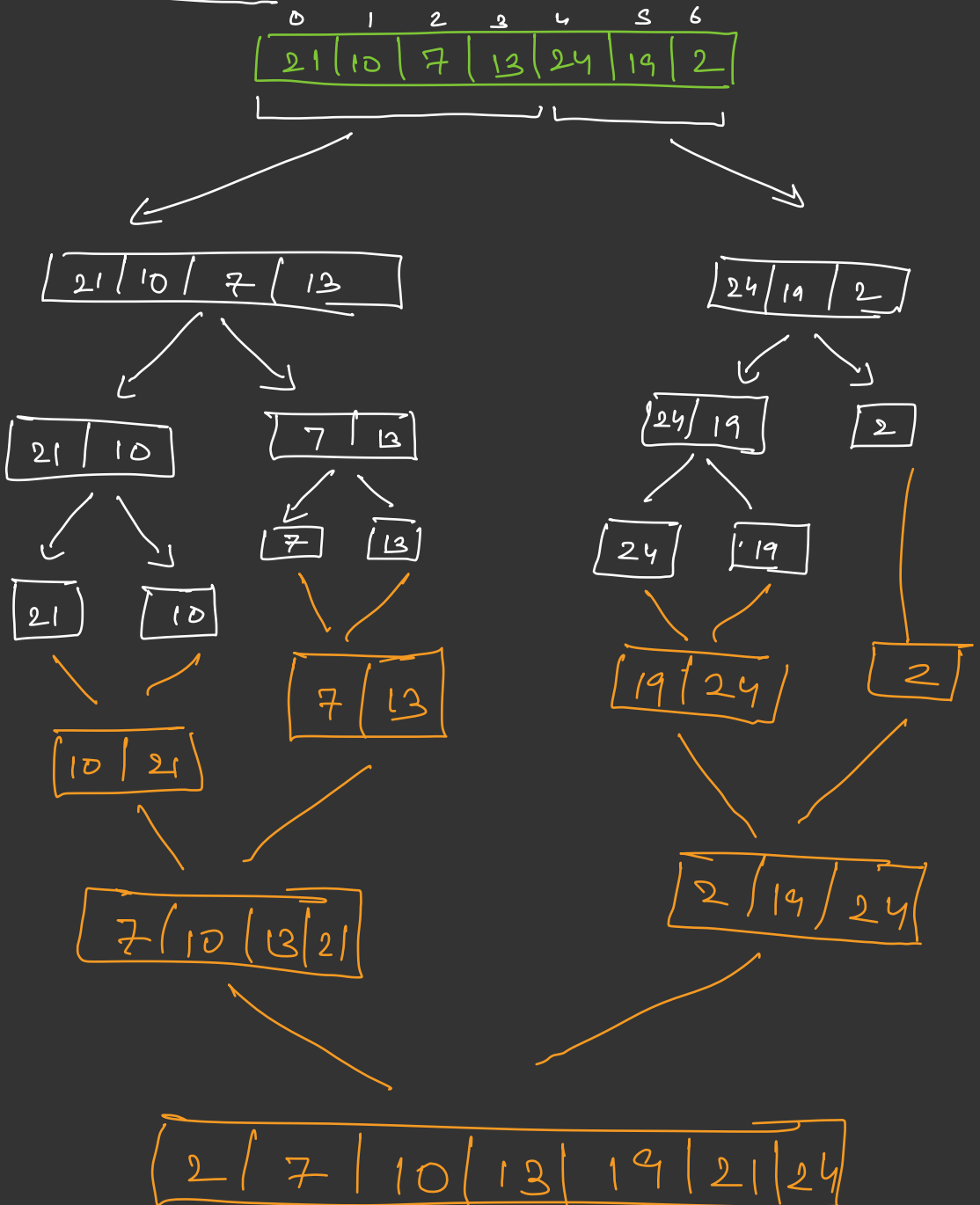Exception Handling by Programmer

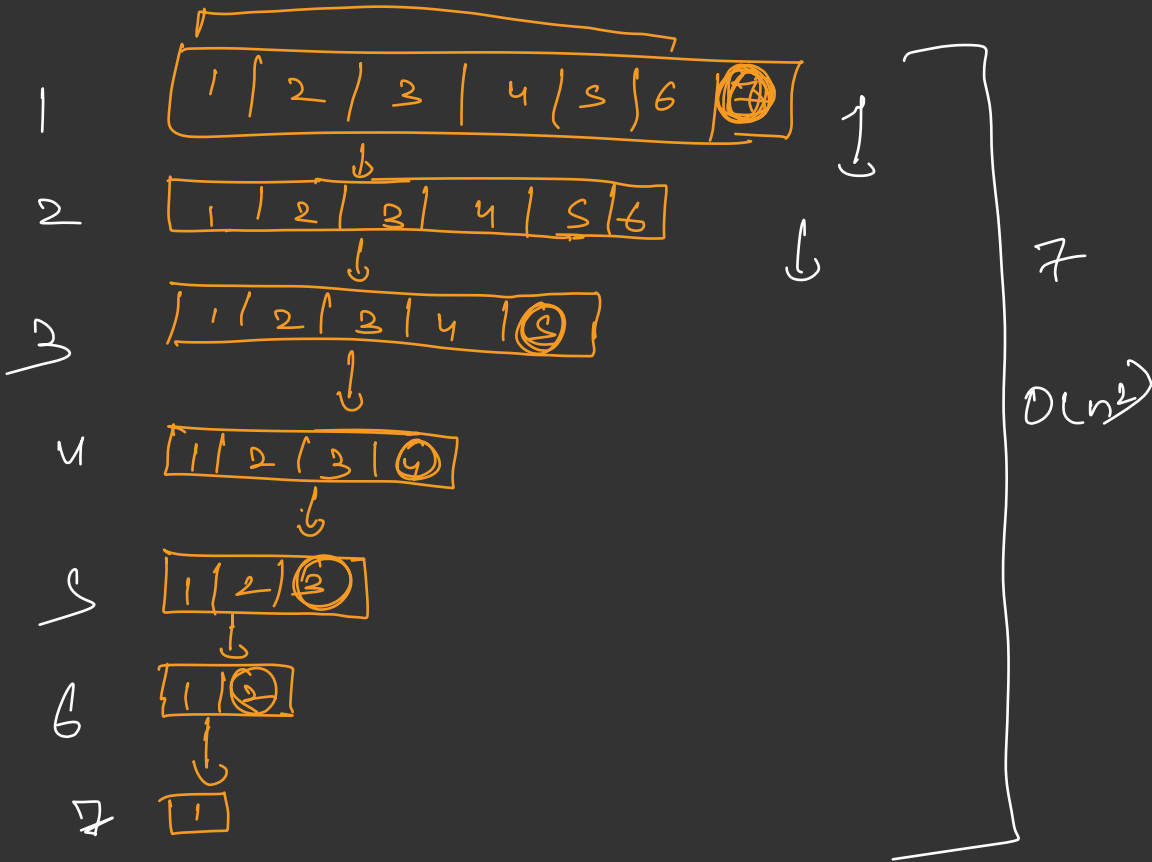 ① try   ② Catch   ③ Finally

  ④ throw   ⑤ throws

  ① try block

      ↳ used for identification

Merge Sort

	0	1	2	3	4	5	6
	21	10	7	13	24	19	2

21	10	7	13

24	19	2

21	10

7	13

24	19

2

21

10

7

13

24

19

7	13

19	24

2

10	21

7	10	13	21

2	19	24

2	7	10	13	19	21	24

Quick Sort

1 | 1 | 2 | 3 | 4 | 5 | 6 | (7) | 1

2 | 1 | 2 | 3 | 4 | 5 | 6 |

3 | 1 | 2 | 3 | 4 | (5) |

4 | 1 | 2 | 3 | (4) |

5 | 1 | 2 | (3) |

6 | 1 | (2) |

7 | 1 |

7

$O(n^2)$

l   h

| 20 | 2 | 18 | 7 | 14 | (10) |

partition → area, l, hi, pi →

QS | 2 | 7 | 10 | 20 | 18 | 14 |

QS (int a, l, h) {

int pi   = partion(a, l, h, a[h]);
   QS (a, l, pi -1);
   QS (a, pi +1, hi);

Ques

| 1 | 2 | 4 | 6 | 3 |

0 | 1 / 3 |
↑

l | 2 | 4 | 6 |
↑