

30. Promise Combinators & their Polyfills

Agenda:

- What are promise combinators
- Promise.all
- Promise.allSettled
- Promise.race
- Promise.any
- Polyfills for them

Promise Combinators

Handle

Multiple promises together -

Promise.all

• race

• allSettled

• any

• Promise.all :

- Run all promises in **parallel** & wait for all of them to complete before proceeding.

• `Promise.all [p1, p2, p3] . then() . ---`

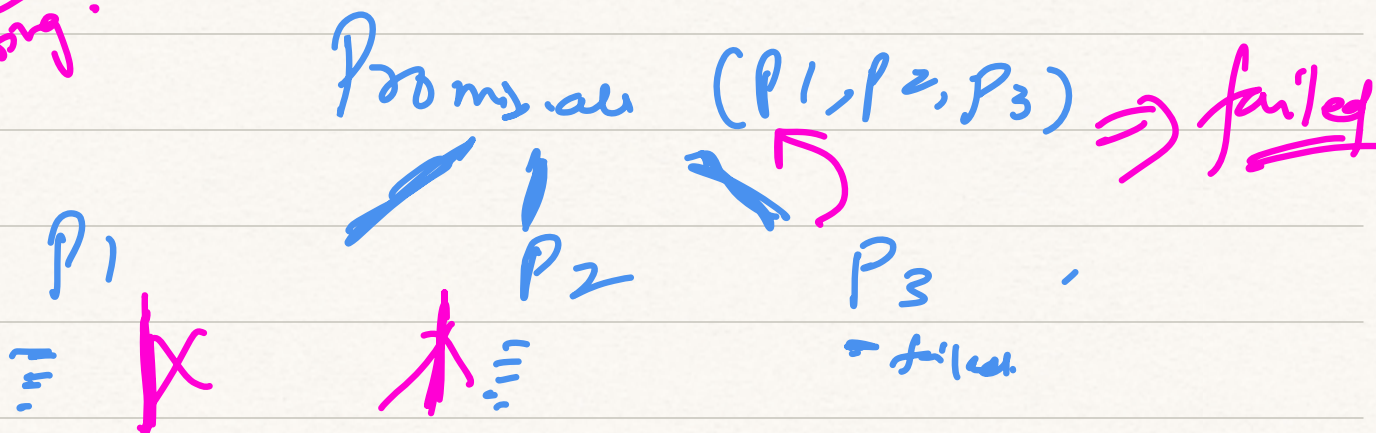
returns a single promise when all of them resolves, or it rejects if any of them fails (rejects)

- Returns result in array in "SAME ORDER".

`Promise.all` → returns/resolves only when 'all' promises ~~return~~ resolves successfully.

Immediately rejects upon any of input promise rejecting.

rejects → If even one fails.



* Promise.allSettled

Waits for all promises to either resolve or reject. $\&$ then resolves with array of objects representing outcome of each promise. (maintain order).

```
[ {status: fulfilled, value: ...},  
  {status: rejected, reason: '^'} ]
```

Completion of all is critical irrespective of the results

Promise.race !

Promise.race [p1, p2, p3] • then
• catch

p1 →
p2 →
p3 →

Whichever promise settles first,
(whether resolve or reject),
that will be returned by
Promise.race.

Promise.any :

Promise.any [p1, p2, p3, ...] . then(c)
. catch(c)

Returns 1st Successful promise (that resolves),
ignoring any promise that rejects unless
all promises are rejected.

p1	p2	p3
↓	↓	↓
500	1000	200
Success	Success	fail

⇓
p1. (Focus on 1st
Successful
promise)

p1	p2
Fail	Fail

returns both in an array of
AggregateError instance
[can use catch(err)
to use them]

• all

Returns all promises in an array if all are resolved.
If any one fails, promise rejects.
• Order maintained

• AllSettled

Returns all promises in ^{objects} array, both resolved & rejected in a given order.
[{ status: fulfilled, value: room }
{ status: rejected, value: room }]

• race

return first promise that 'settles'.
No matter Success or fail.
Let first one to complete.
'Winner'.

• any

Returns 1st 'Success' resolved promise.
If, all promises are rejected, then it returns all promises in an array & rejected.
[use indicate()]

Promise.all

Promise.all [p1, p2, p3]



return a promise []



[res1, res2, ...and p3]

all successful

Order maintained.



rejects ^{with the} promise,

as soon as

even 1 promise fails.

Promise.all

$[P_1, P_2, P_3, P_4]$

✓ | | |

S F F S
1000 20 50 5000

$[P_1, P_2, P_3]$

* all fails

$\Rightarrow [err1, err2, err3]$

Still returns P.1

[race but with
~~the~~ 1st successful
output]

• Catch

Gives all
error.