Overview of the Future Lifecycle & Common Human Known Uses

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Learning Objectives in this Part of the Lesson

- Understand the need for the *Future* pattern & Java Future interface

- Recognize the lifecycle of a Future & human known uses of the *Future* pattern

: ex66

: Active Object

main()

Active Object(…)

start()

run()

get()
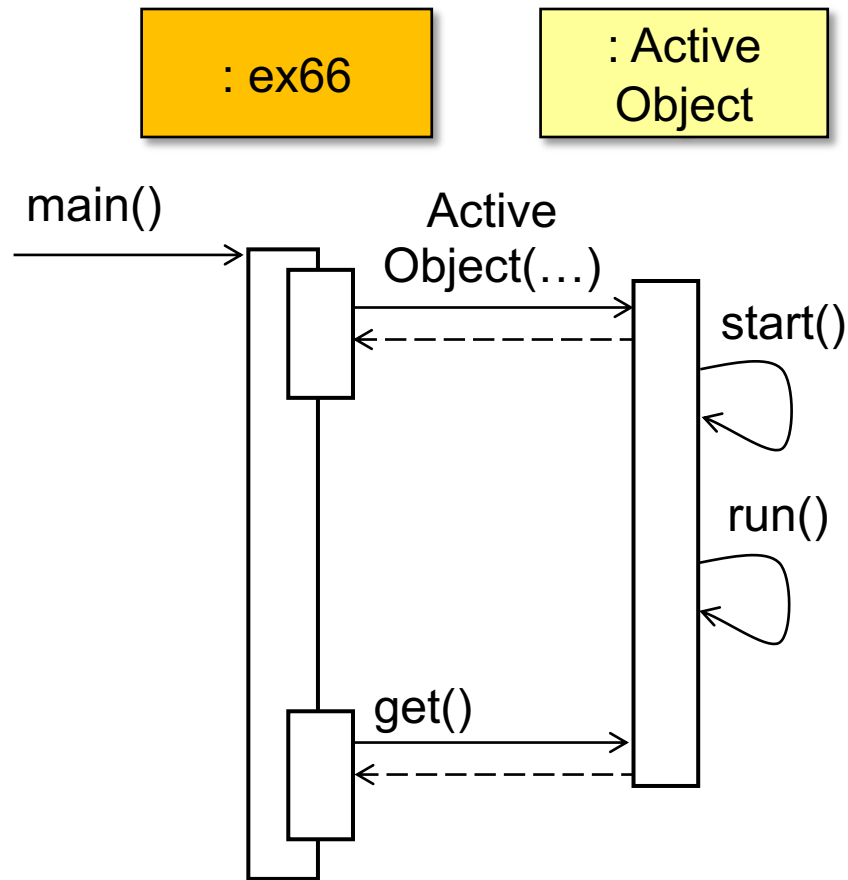
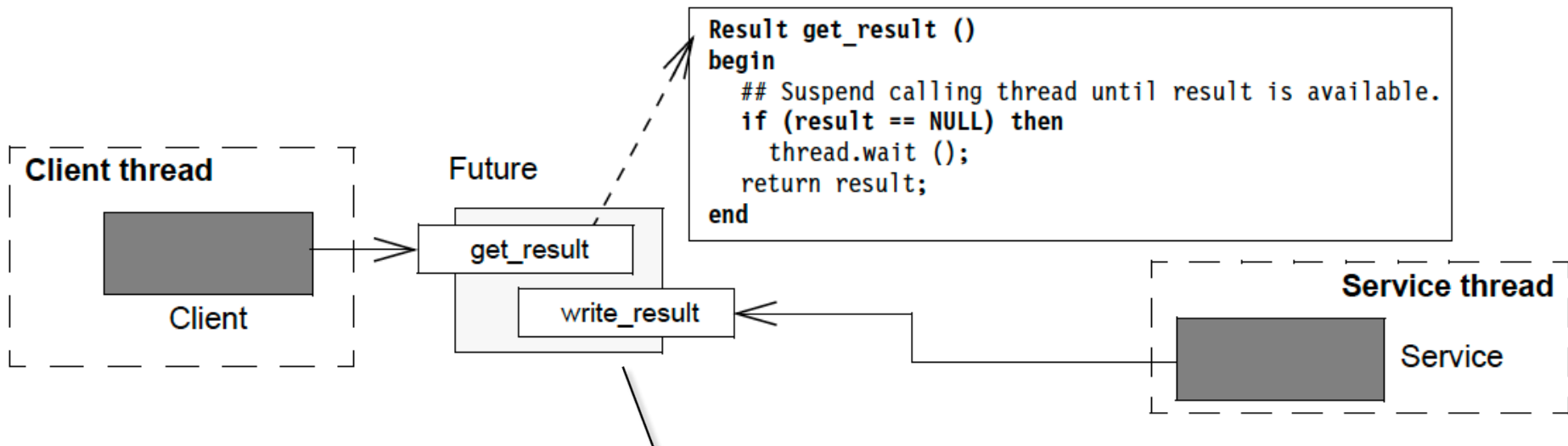# Learning Objectives in this Part of the Lesson

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Overview of the Future Lifecycle
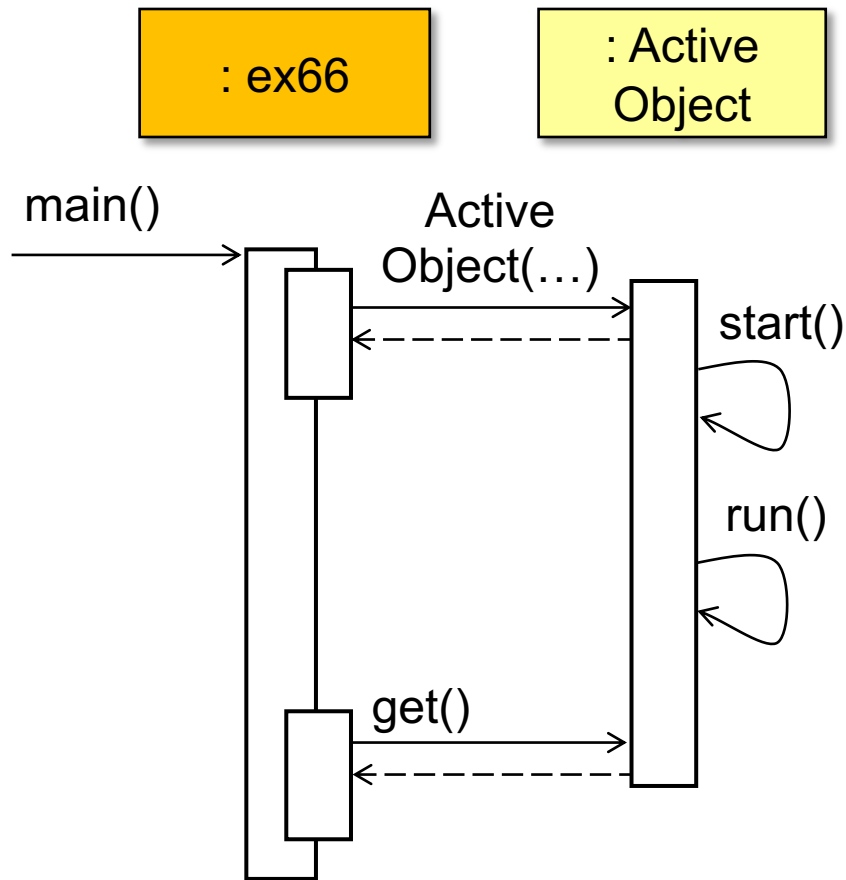
Overview of the Future Lifecycle

- A Future is a proxy that represents the result of an asynchronous call


```
Result get_result ()
begin
    ## Suspend calling thread until result is available.
    if (result == NULL) then
        thread.wait ();
    return result;
end
```

Provides a 'virtual' data object that blocks (or do not block) clients when they try to get its contents before its concurrent computation completes

See en.wikipedia.org/wiki/Futures_and_promises
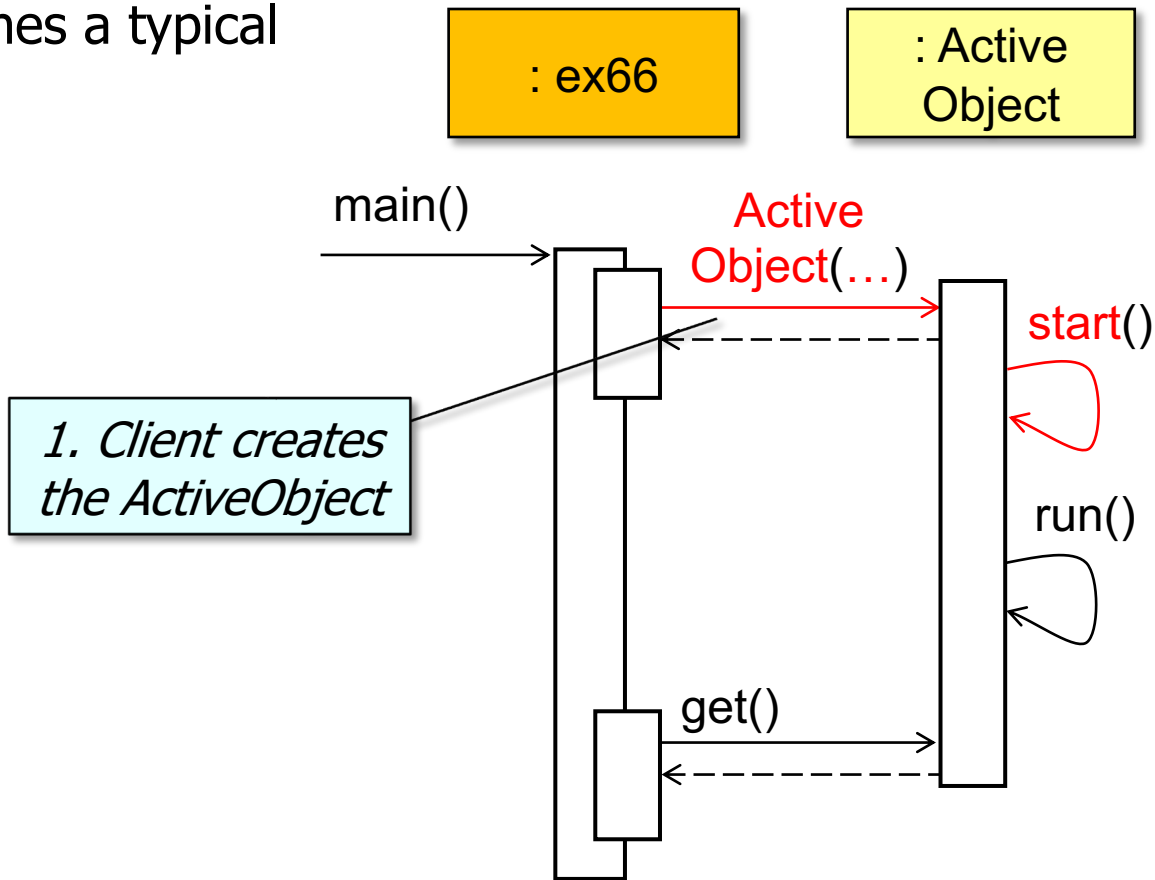
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1. Client creates the ActiveObject

get()

See ModernJava/blob/main/FP/ex16/src/main/java/utils/ActiveObject.java

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2. Return a Future back to the client

get()

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3. Run the computation asynchronously in a background Thread

get()

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```
: ex66        : Active
              Object
```

main()

Active
Object(…)

start()

run()

4. Client can perform other processing
(i.e., there's no need for it to block)
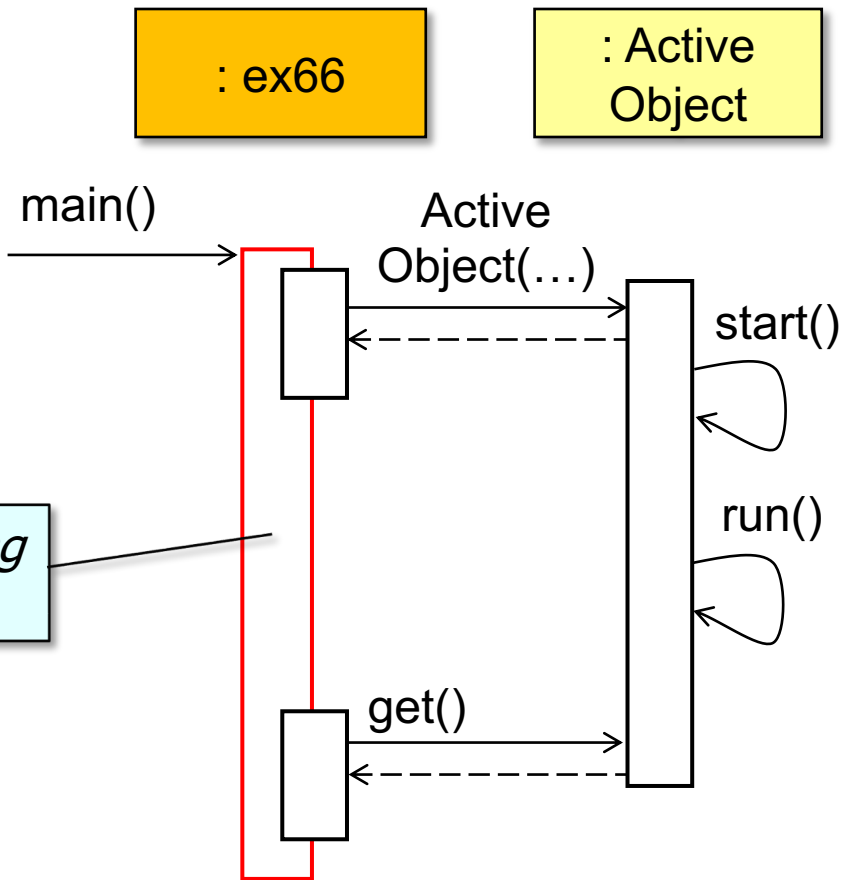
get()

Overview of the Future Lifecycle

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main()

Active Object(...)

start()

run()

5. Client obtains the result from the Future only after the async computation completes

get()
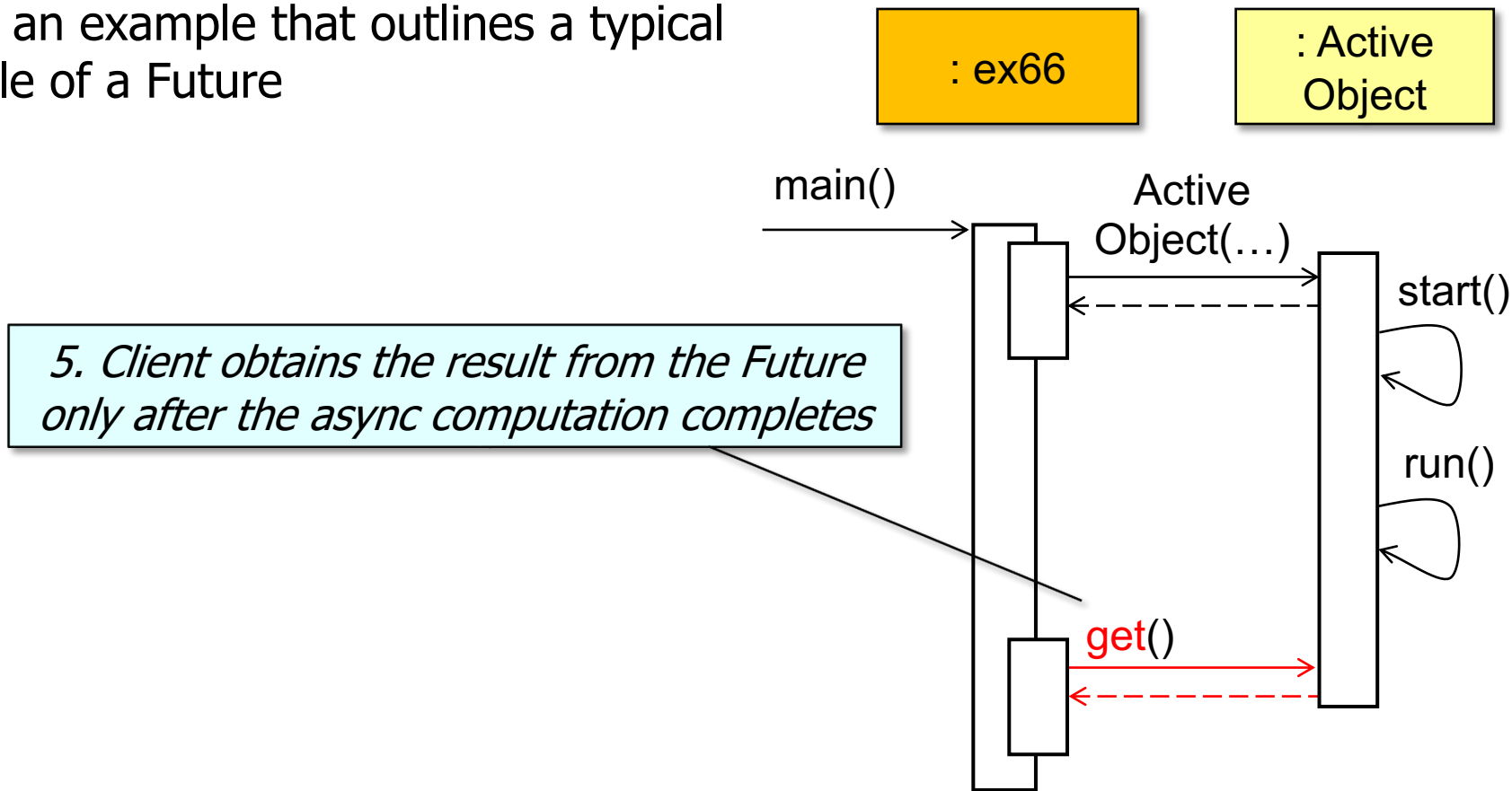
Human Known Uses of the *Future* Pattern

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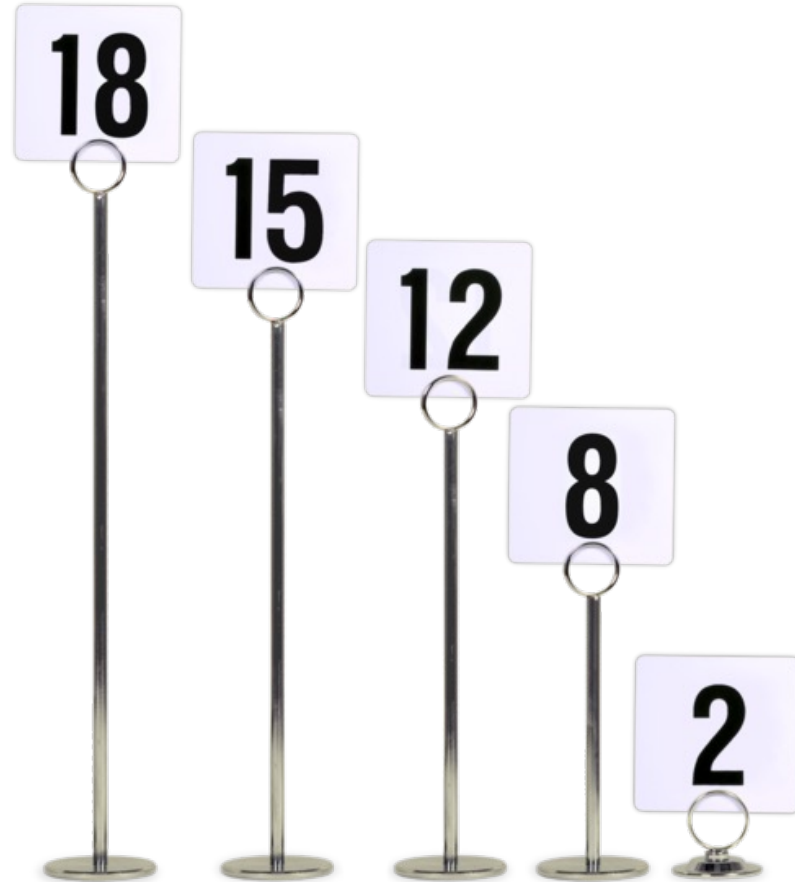
- Restaurant table tent #'s, order # receipts, & table # stands are human known uses of futures!

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McDonald's historically performed "synchronous" transactions (i.e., the client blocks) & 'cached' food items in heat lamps to keep warm

See www.latimes.com/archives/la-xpm-1998-mar-27-fi-33150-story.html

Human Known Uses of the *Future* Pattern

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Wendy's receipt:
```
Wendy's
Welcome to Wendy's #00011357
5596 Hixson Pike TN  37343
423-521-7687

Check 125
James R.                    8/8/201
EatIn                       12:48 P

Double Baconator             5.99
Large Fries                  2.19
MD Chocolate Frosty          1.79
Homestyle Chicken Sandw      4.39
Small Water                  0.00 *

ubtotal                     14.36
ax                           1.33
OTAL                        15.69

ish                        -20.00 *
HANGE DUE                    4.31

THANK YOU FOR YOUR PATRONAGE!
```

QUALITY IS OUR RECIPE
WENDY'S
OLD FASHIONED
HAMBURGERS

Wendy's historically performed "asynchronous" transactions via "futures" (i.e., the client doesn't block) & cooked food to order

See www.wendys.com/csr-what-we-value/food/quality/fresh

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End of Overview of the Future Lifecycle & Common Human Known Uses