INSIDE IQUERYABLE

THE POWER ⚡ OF .NET EXPRESSIONS

@JEREMYLIKNESS

@CLEVERSNTGEEK

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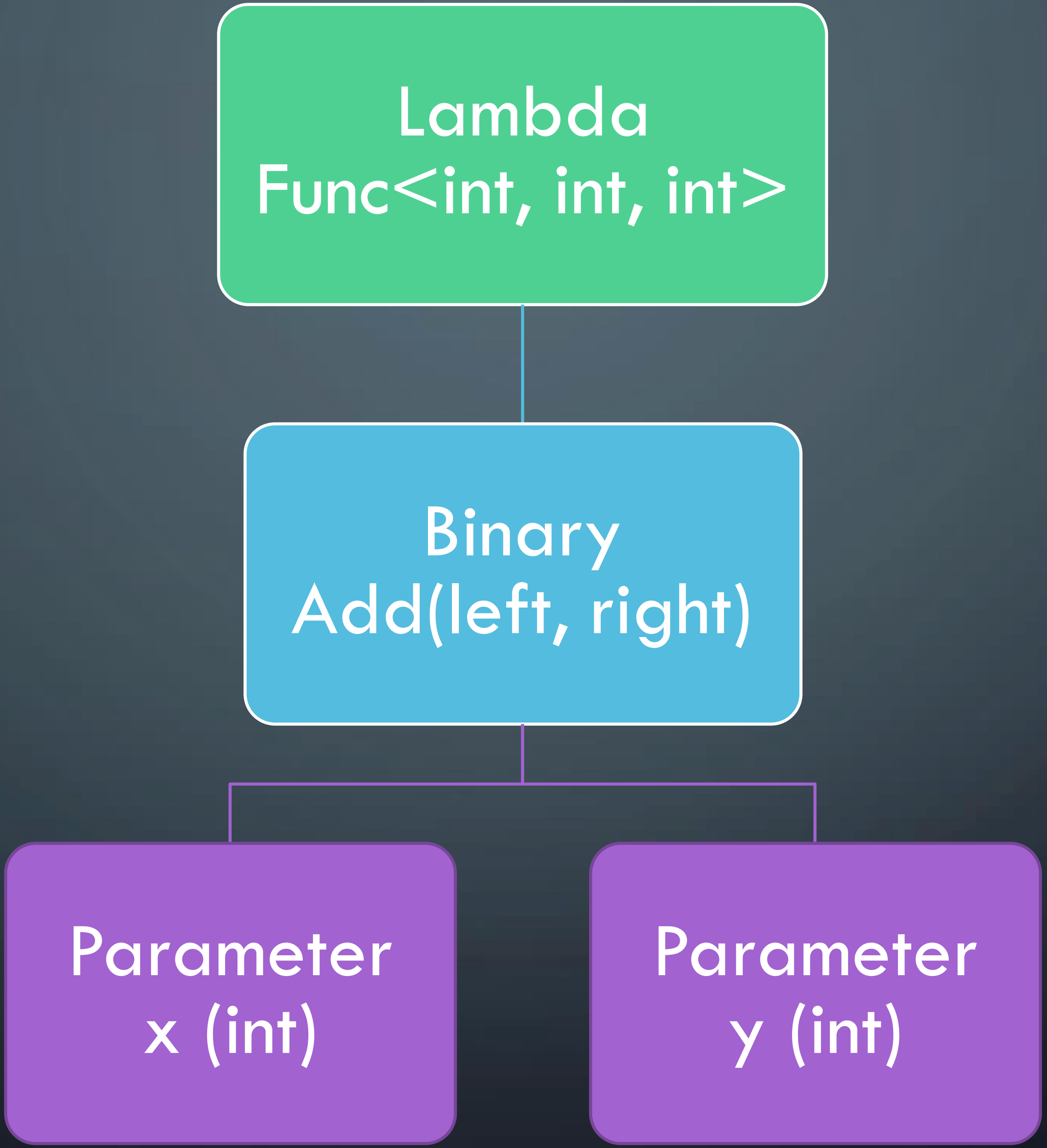
WHY EXPRESSIONS?

DEMO: BLAZOR WEBASSEMBLY

40 + 2

DEMO: INTRO TO EXPRESSIONS

01-INTRO-EXPRESSIONS.IPYNB



Lambda
Func<int, int, int>

Binary
Add(left, right)

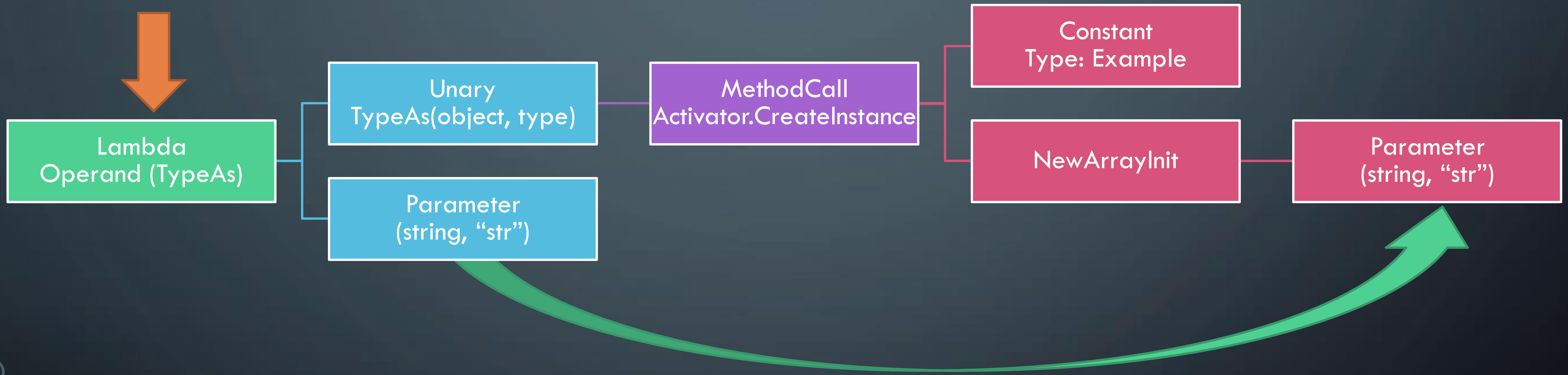
Parameter
x (int)

Parameter
y (int)

DEMO: CONSTRUCTORS

02-CONSTRUCTOR-EXAMPLE.IPYNB

```
Expression<Func<string, Example>> expr4 =
str => Activator.CreateInstance(typeof(Example), str) as Example;
```



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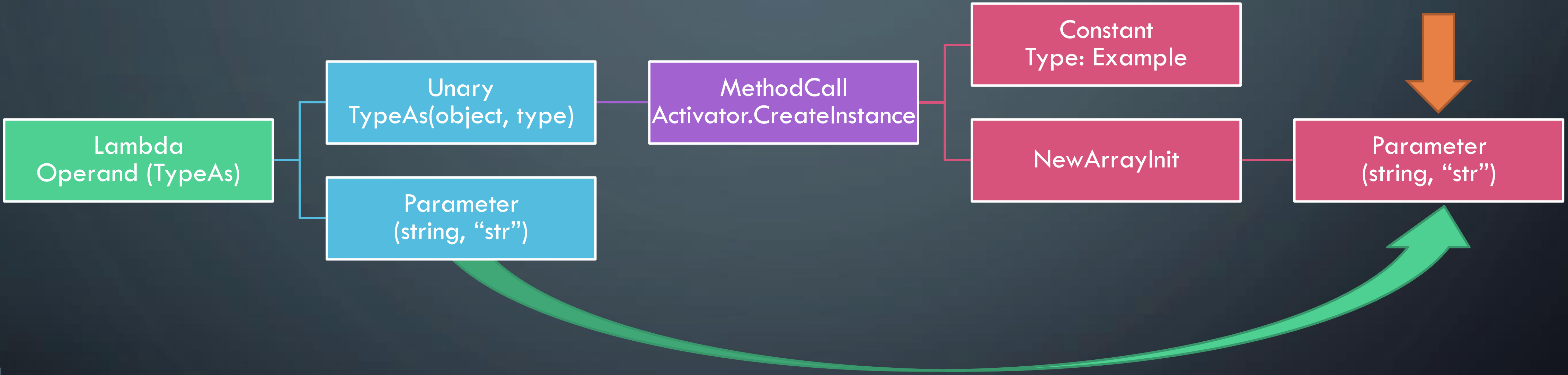

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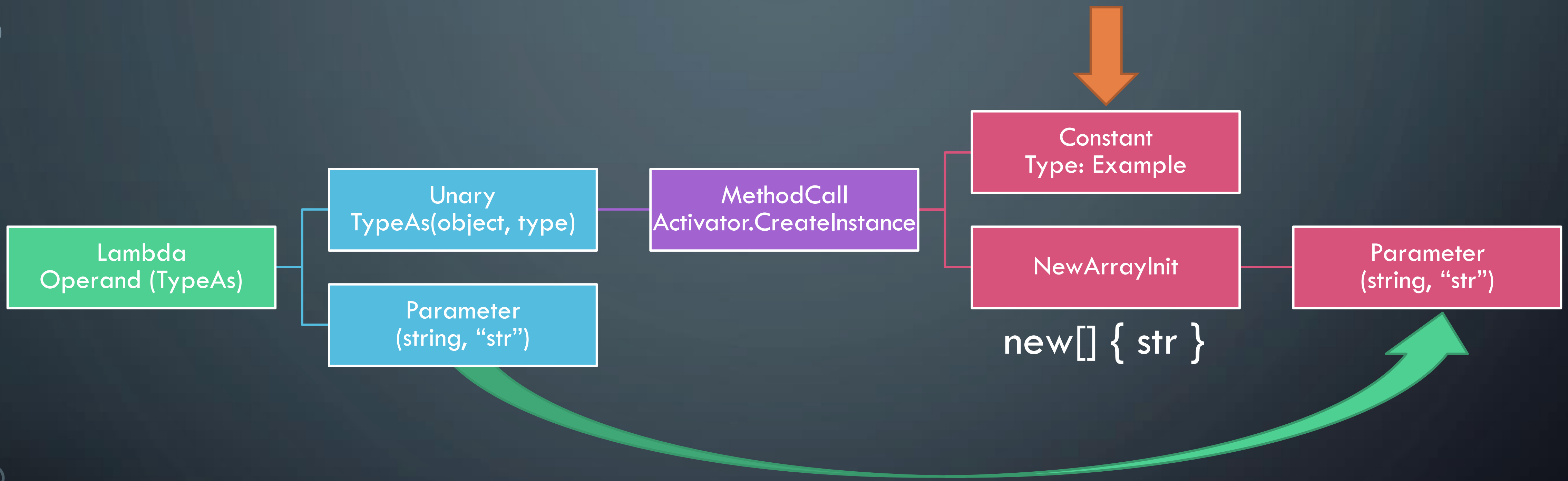


Lambda
Operand (TypeAs)

Unary
TypeAs(object, type)

Parameter
(string, “str”)

MethodCall
Activator.CreateInstance

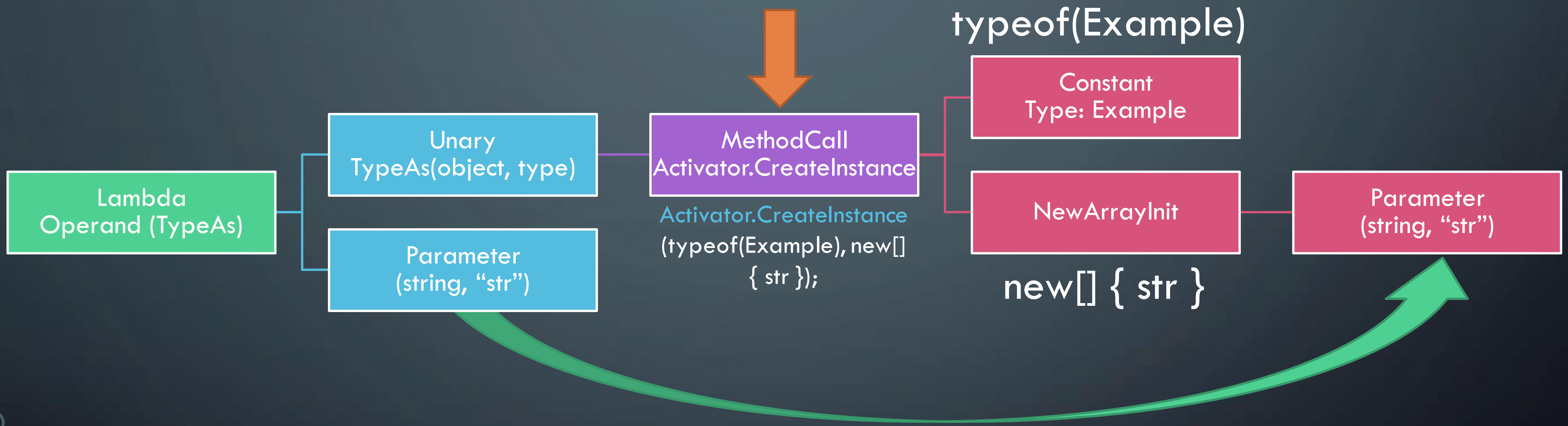
Constant
Type: Example

NewArrayInit

Parameter
(string, “str”)

new[] { str }

```
Expression<Func<string, Example>> expr4 =
str => Activator.CreateInstance(typeof(Example), str) as Example;
```



typeof(Example)

Constant
Type: Example

Lambda
Operand (TypeAs)

Unary
TypeAs(object, type)

Parameter
(string, “str”)

MethodCall
Activator.CreateInstance

Activator.CreateInstance
(typeof(Example), new[]
{ str });

NewArrayInit

Parameter
(string, “str”)

new[] { str }

```
Expression<Func<string, Example>> expr4 =
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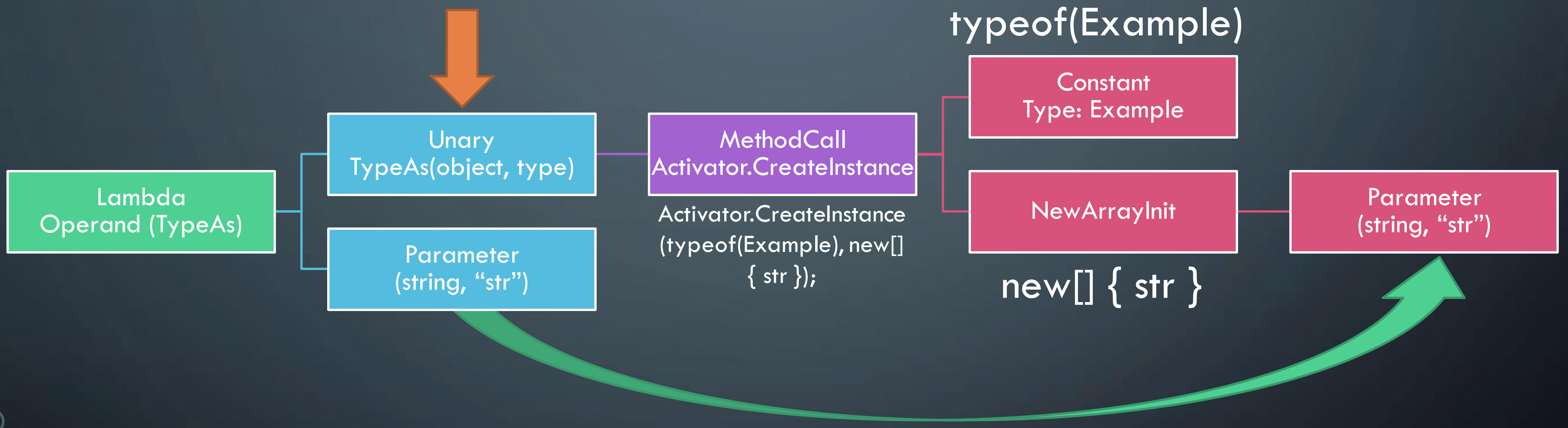

typeof(Example)

Lambda
Operand (TypeAs)

Unary
TypeAs(object, type)

Parameter
(string, “str”)

MethodCall
Activator.CreateInstance

Activator.CreateInstance
(typeof(Example), new[]
{ str });

Constant
Type: Example

NewArrayInit

new[] { str }

Parameter
(string, “str”)

```
Expression<Func<string, Example>> expr4 =
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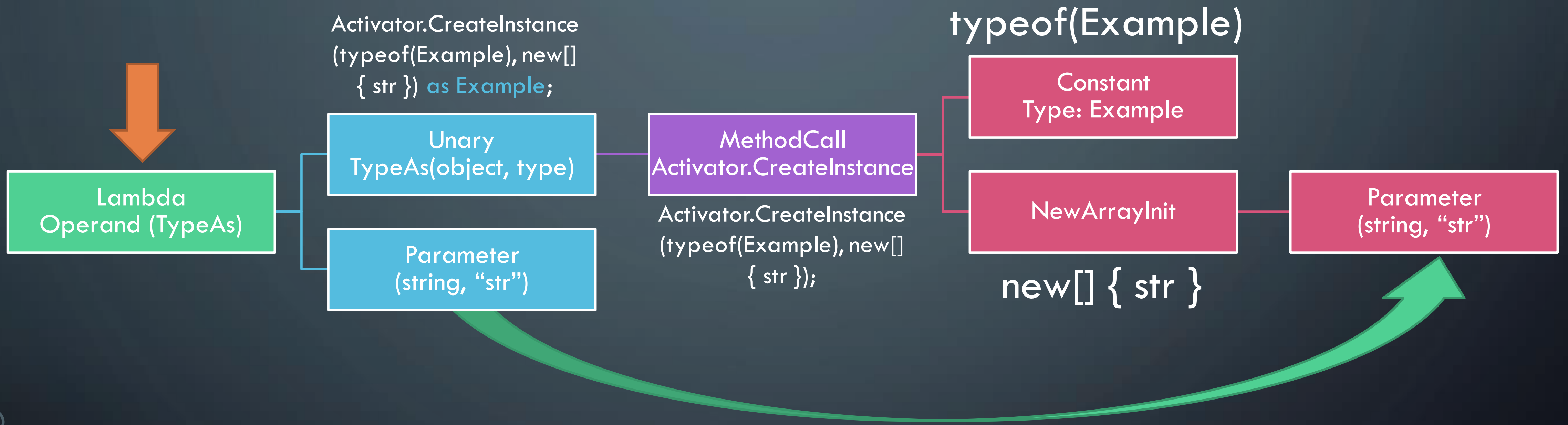


Activator.CreateInstance (typeof(Example), new[] { str }) as Example;

Lambda
Operand (TypeAs)

Unary
TypeAs(object, type)

Parameter
(string, “str”)

MethodCall
Activator.CreateInstance

Activator.CreateInstance (typeof(Example), new[] { str });

typeof(Example)

Constant
Type: Example

NewArrayInit

new[] { str }

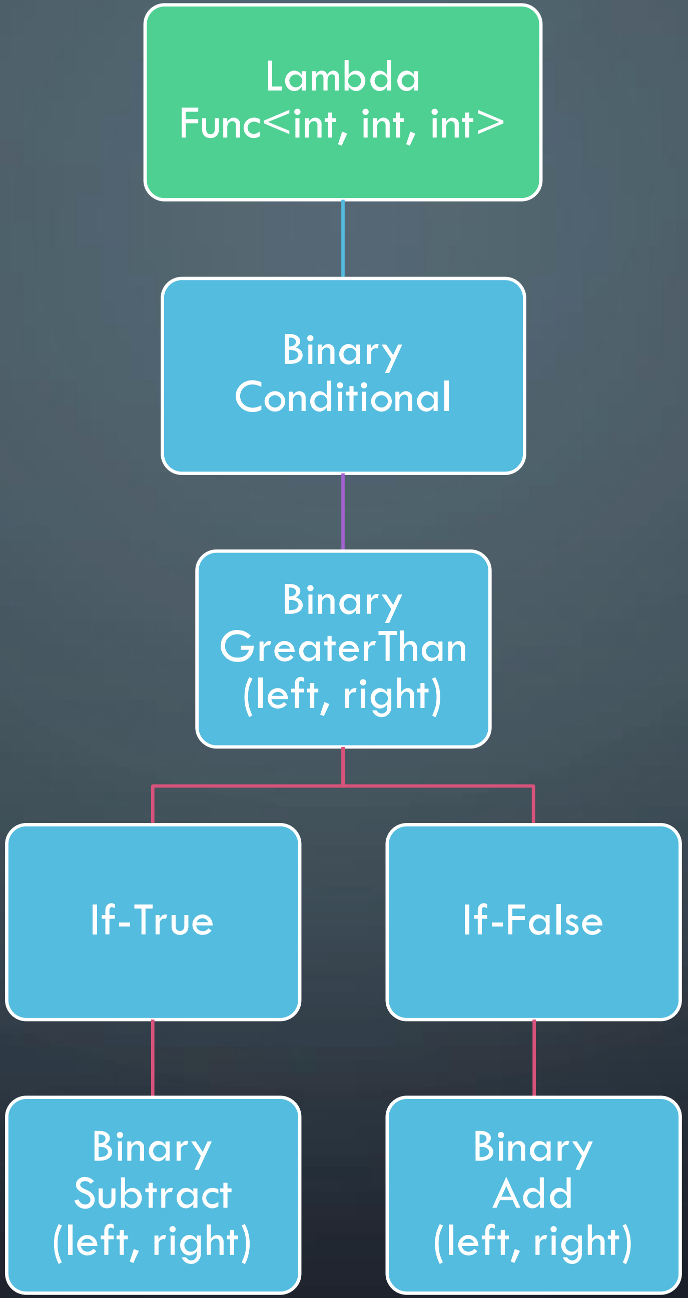
Parameter
(string, “str”)

BUT WHAT ABOUT PERFORMANCE?

BENCHMARKING NEW() VS. ACTIVATOR.CREATEINSTANCE() VS. EXPRESSION.NEW()

ADVANCED EXPRESSIONS

03-ADVANCED-EXPRESSION.IPYNB



Lambda
Func<int, int, int>
Binary
Conditional
Binary
GreaterThan
(left, right)
If-True
If-False
Binary
Subtract
(left, right)
Binary
Add
(left, right)

EXPRESSION RECAP

01

Expressions are building blocks for declarative code

EXPRESSION RECAP

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Expressions are building blocks for declarative code

02

Expressions perform at speeds close to native code

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Expressions are building blocks for declarative code

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03

Expression trees are immutable and represent the *definition* of code to run

EXPRESSION RECAP

01

Expressions are building blocks for declarative code

02

Expressions perform at speeds close to native code

03

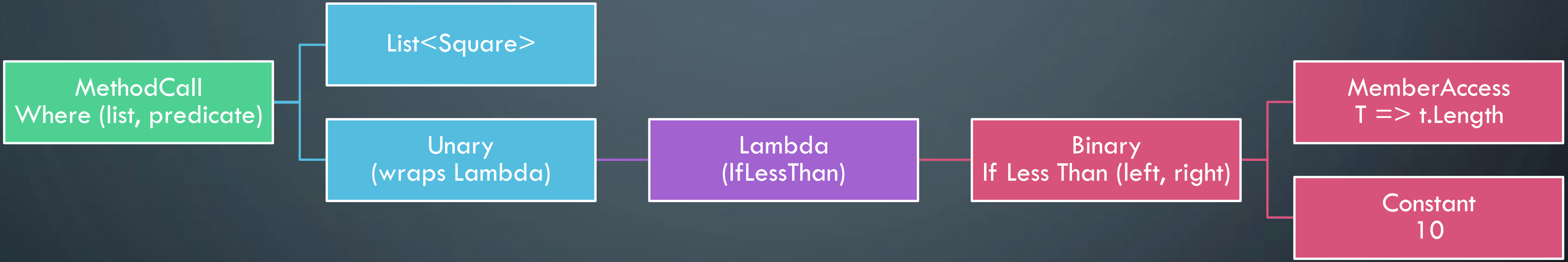
Expression trees are immutable and represent the *definition* of code to run

04

Lambda expressions help turn expression trees into the *implementation* of code to run via "Compile"

INTRODUCING IQUERYABLE

04-INTRODUCING-IQUERYABLE.IPYNB



MethodCall
Where (list, predicate)

List<Square>

Unary
(wraps Lambda)

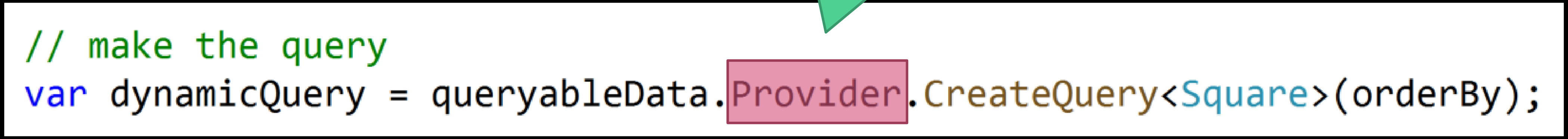
Lambda
(IfLessThan)

Binary
If Less Than (left, right)

MemberAccess
T => t.Length

Constant
10

Here Be Dragons



```
// make the query
var dynamicQuery = queryableData.Provider.CreateQuery<Square>(orderBy);
```

WHY IQUERYABLE?

The provider is magic

Add metadata and state

Dynamic expressions

Snapshots before/after the tree is implemented

Inspect the tree and do something different… like generate SQL (EF Core)

Mutate the tree (wait, isn't it immutable?)

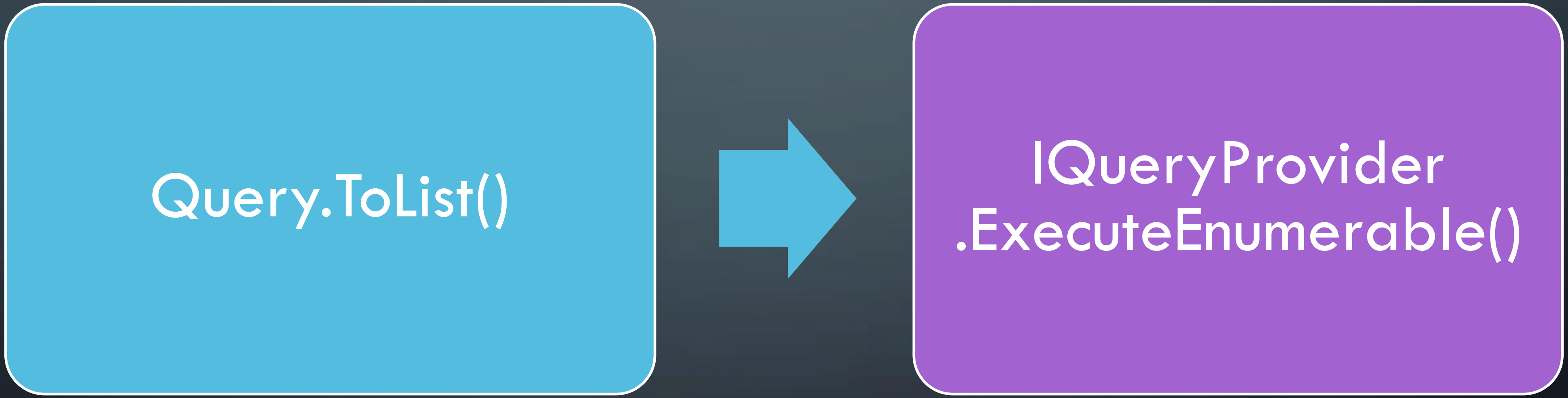
PROVIDER AND SNAPSHOT

05-PROVIDER-AND-SNAPSHOTS.IPYNB

IQUERYPROVIDER

Query.ToList()

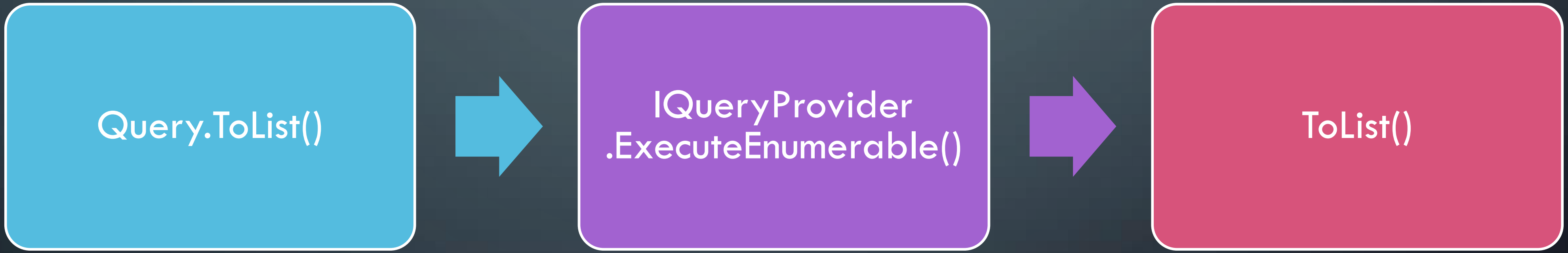
IQUERYPROVIDER



Query.ToList()

IQueryProvider
.ExecuteEnumerable()

IQUERYPROVIDER



Query.ToList()

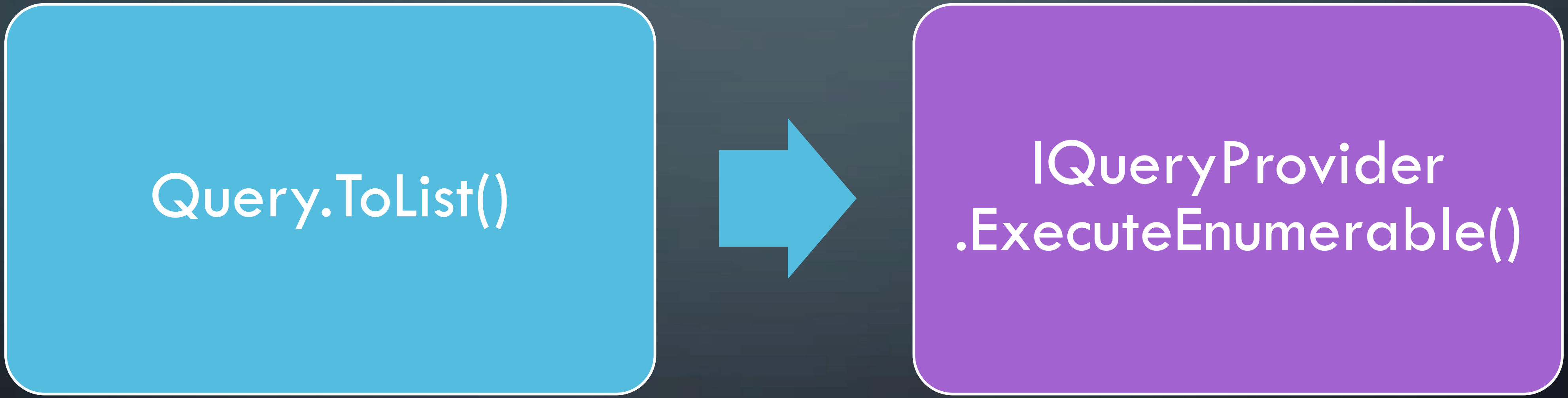
IQueryProvider
.ExecuteEnumerable()

ToList()

ISNAPSHOTQUERYPROVIDER

Query.ToList()

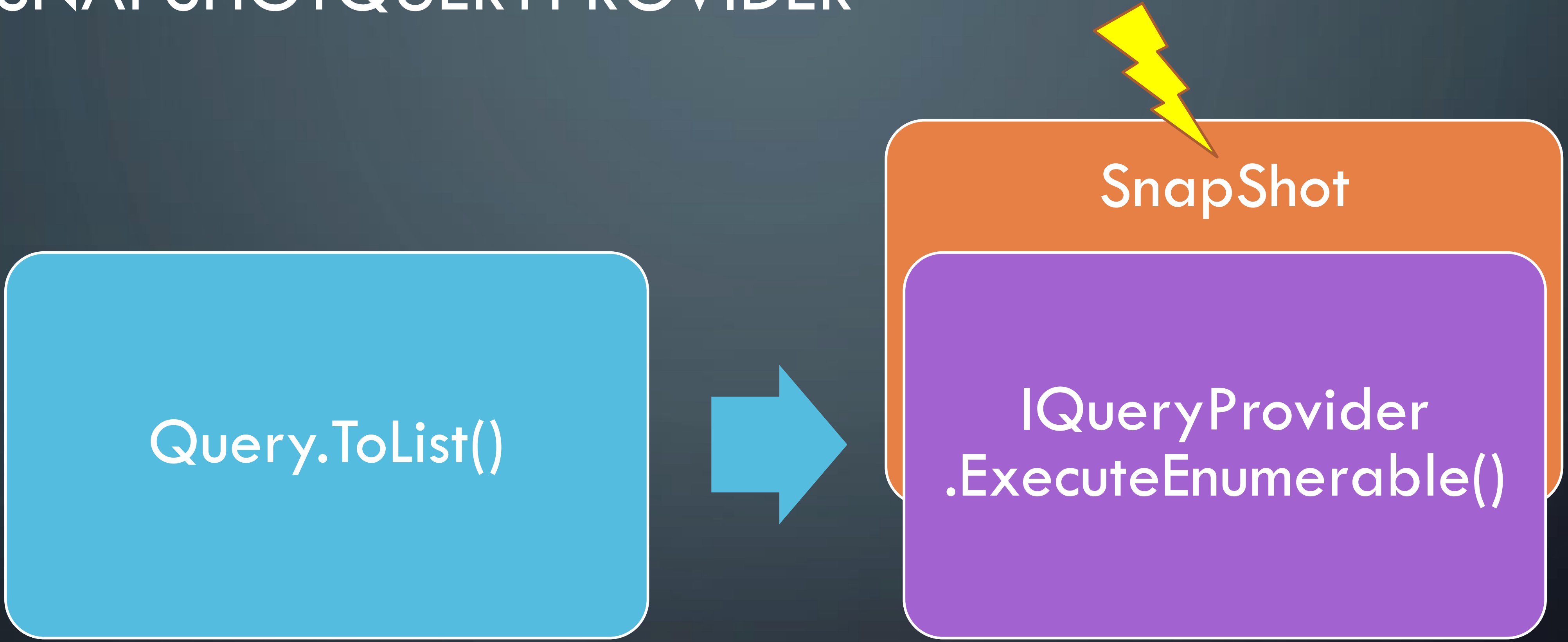
ISNAPSHOTQUERYPROVIDER



Query.ToList()

IQueryProvider
.ExecuteEnumerable()

ISNAPSHOTQUERYPROVIDER

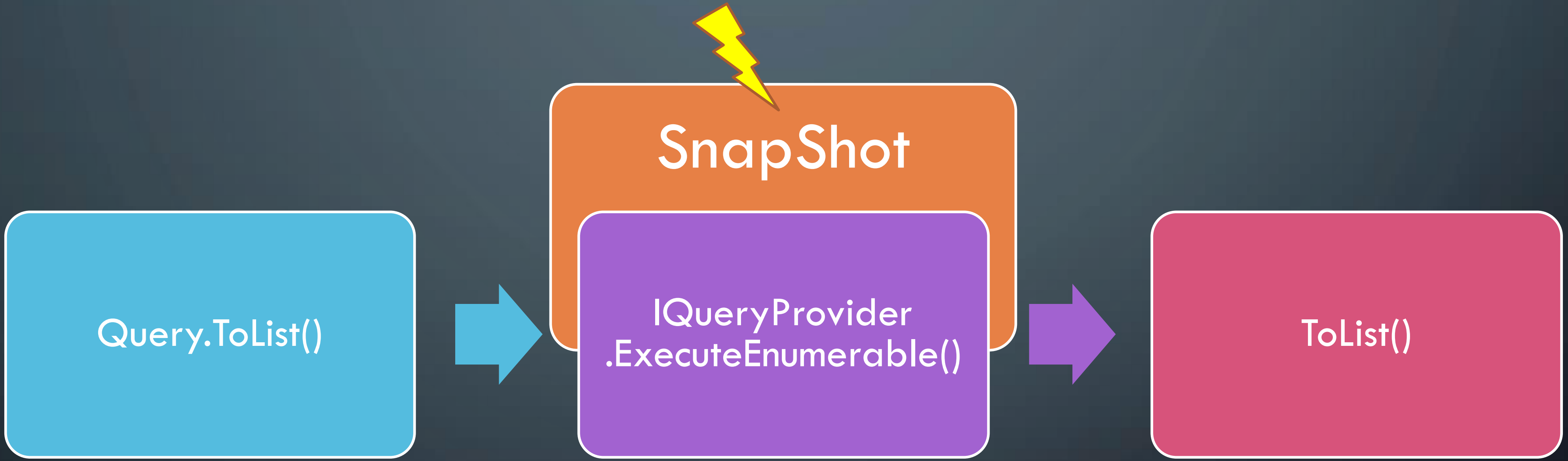


Query.ToList()

SnapShot

IQueryProvider
.ExecuteEnumerable()

ISNAPSHOTQUERYPROVIDER



https://github.com/JeremyLikness/ExpressionPowerTools/blob/master/src/ExpressionPowerTools.Core/Providers/QuerySnapshotProvider.cs

MUTATION

THE QUERY TRANSFORMER (QUERYMUTATORS)

THANK YOU!

@JEREMYLIKNESS

HTTPS://GITHUB.COM/JEREMYLIKNESS/IQUERYABLEEXPRESSIONEXAMPLES

HTTPS://GITHUB.COM/JEREMYLIKNESS/EXPRESSIONPOWERTOOLS