



INTRODUCTION TO R FOR FINANCE

What is a data frame?

Data frame

	Column 1	Column 2	Column 3
Row 1	data	1	TRUE
Row 2	more data	2	TRUE
Row 3	you really like data	3	TRUE
Row 4	that's enough data	4	FALSE

Data frames and friends

```
> name <- c("Dan", "Dan", "Dan", "Rob", "Rob", "Rob")
> payment <- c(100, 200, 150, 50, 75, 100)

> debt <- data.frame(name, payment)
> debt
  name payment
1  Dan     100
2  Dan     200
3  Dan     150
4  Rob      50
5  Rob      75
6  Rob     100
```

Name that frame!

```
> name <- c("Dan", "Dan", "Dan", "Rob", "Rob", "Rob")
> payment <- c(100, 200, 150, 50, 75, 100)
> debt <- data.frame(name, payment)
```

```
> colnames(debt) <- c("friend", "money")
```

```
> debt
  friend money
1    Dan   100
2    Dan   200
3    Dan   150
4    Rob    50
5    Rob    75
6    Rob   100
```

```
> debt <- data.frame(friend = name, money = payment)
```



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Let's practice!



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Data frame manipulation

Data frame subsets

```
> debt[3:6,]
  name payment
3  Dan     150
4  Rob      50
5  Rob      75
6  Rob     100

> debt[1:3, 2]
[1] 100 200 150

> debt[1:3, 2, drop = FALSE]
  payment
1     100
2     200
3     150

> debt$payment
[1] 100 200 150  50  75 100
```

Subset() for more power

```
> # This works, but is not informative nor robust  
> debt[1:3,]
```

```
> # Much more informative!  
> subset(debt, name == "Dan")
```

	name	payment
1	Dan	100
2	Dan	200
3	Dan	150

```
> subset(debt, payment == 100)
```

	name	payment
1	Dan	100
6	Rob	100



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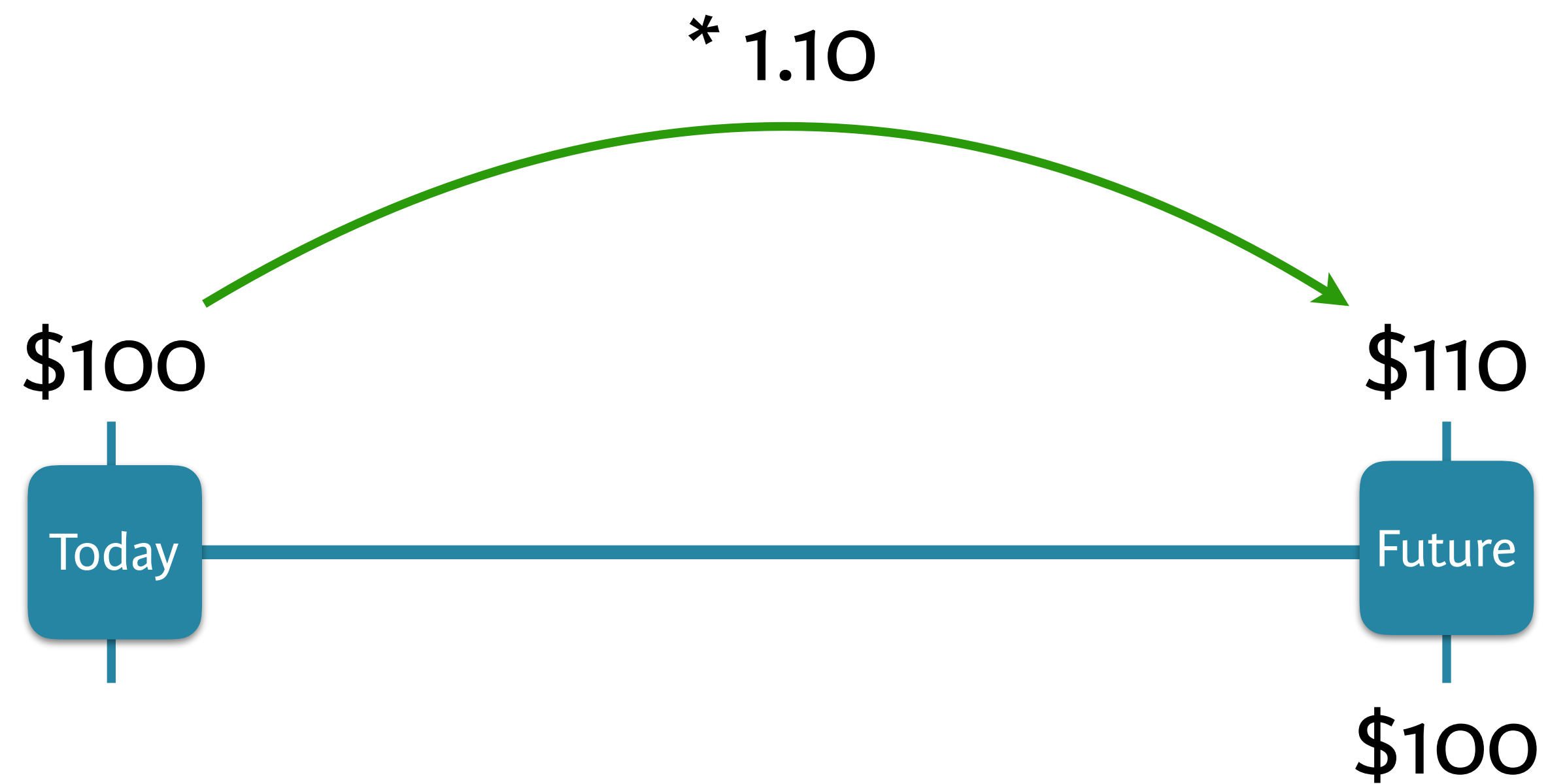
Let's practice!



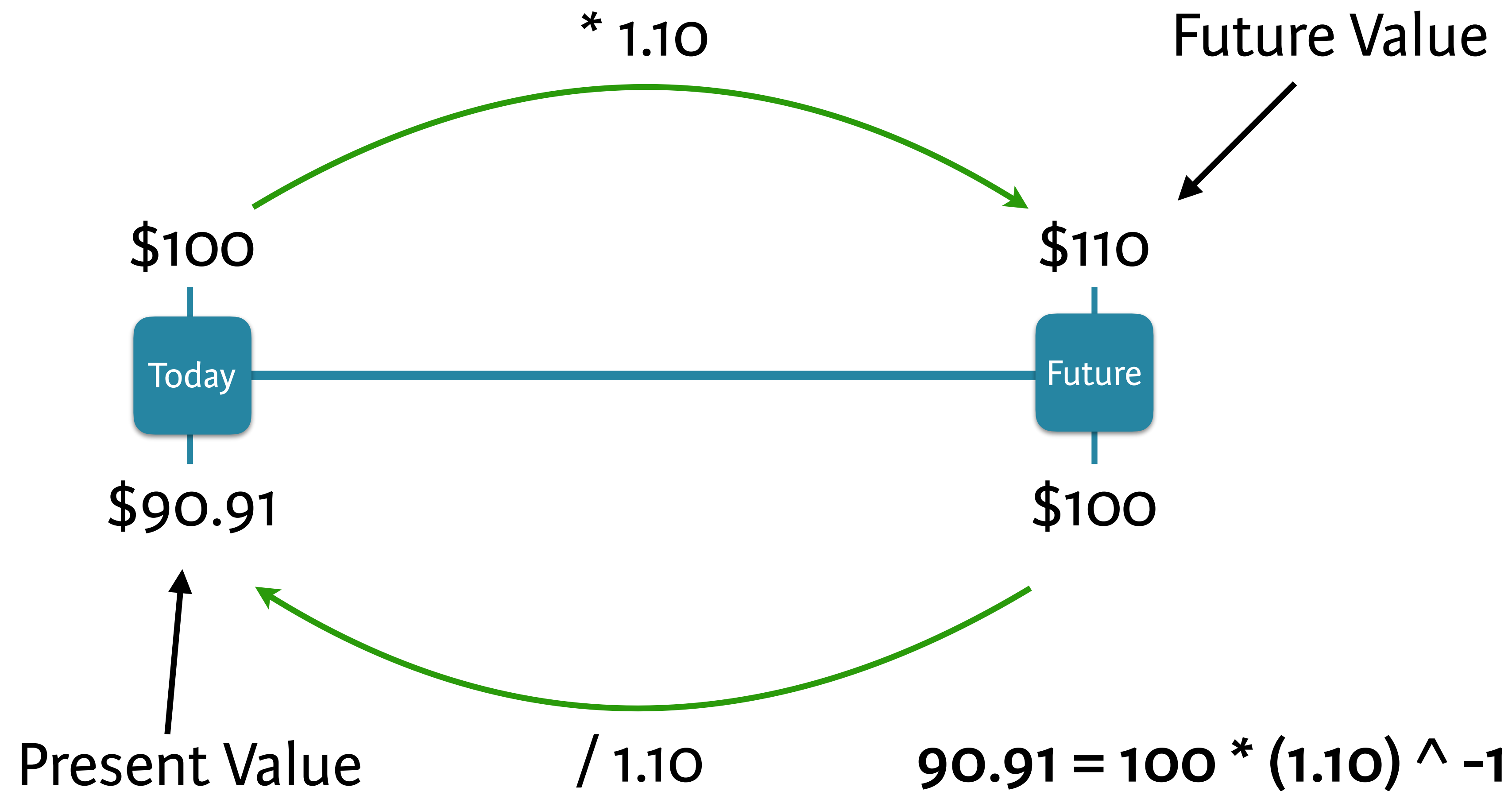
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Present value

Time value of money

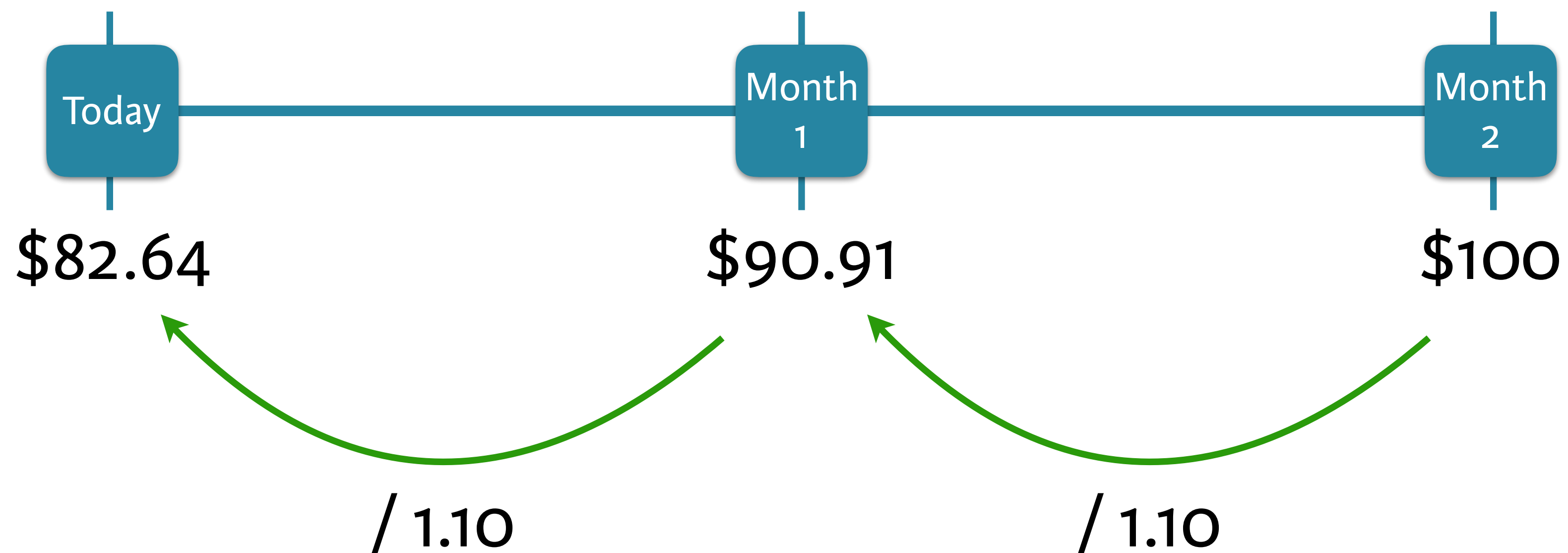


Future value and present value



Present value - multiple periods

$$82.64 = 100 * (1.10)^{-2}$$



Present value - general formula

$$82.64 = 100 * (1.10)^{-2}$$

```
> present_value <- cash_flow * (1 + interest / 100) ^ -periods
```

```
> cash_flow <- 100
```

```
> interest <- 10
```

```
> periods <- 2
```

```
> present_value <- cash_flow * (1 + interest / 100) ^ -periods
```

```
> present_value
```

```
[1] 82.64463
```



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Let's practice!