What is a data frame?

INTRODUCTION TO R FOR FINANCE

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Data frame

	Column 1	Column 2	Column 3
Row 1	data	1	TRUE
Row 2	more data	2	TRUE
Row 3	even more data	3	TRUE
Row 4	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)
```

Let's practice!

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Data frame manipulation

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Data frame subsets

```
debt[3:6,]
```

```
  name payment
3  Dan     150
4  Rob      50
5  Rob      75
6  Rob     100
```

```
debt[1:3, 2]
```

```
100 200 150
```

```
debt[1:3, 2, drop = FALSE]
```

```
  payment
1     100
2     200
3     150
```

```
debt$payment
```

```
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
```

Let's practice!

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Present value

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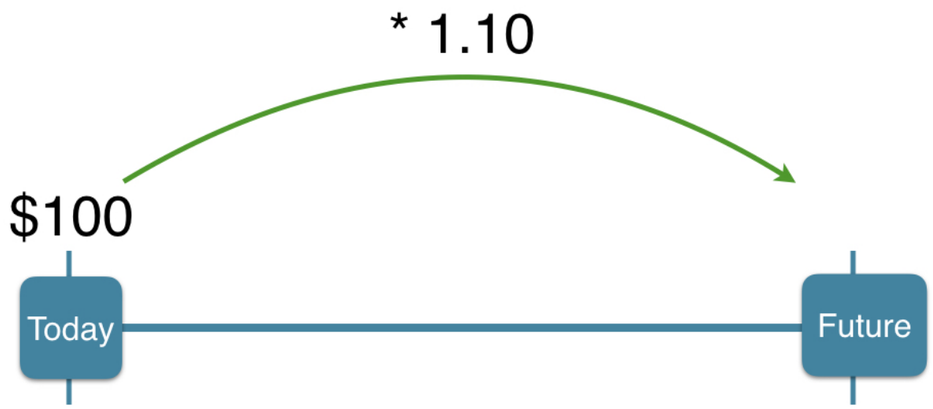
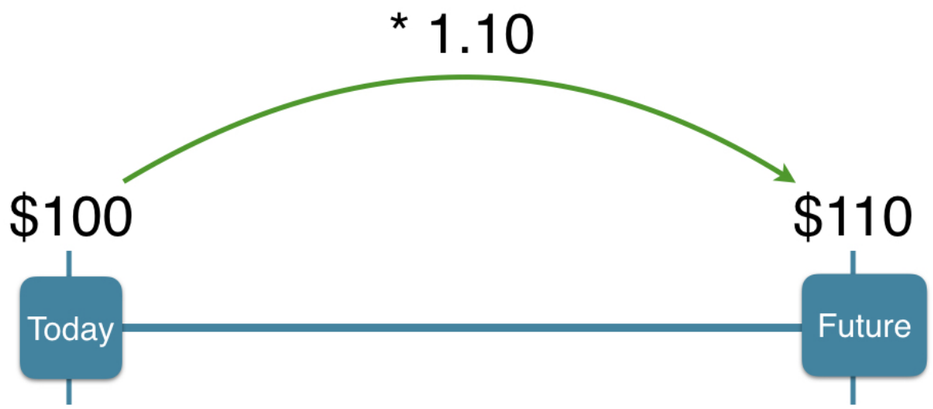
Time value of money

Time value of money

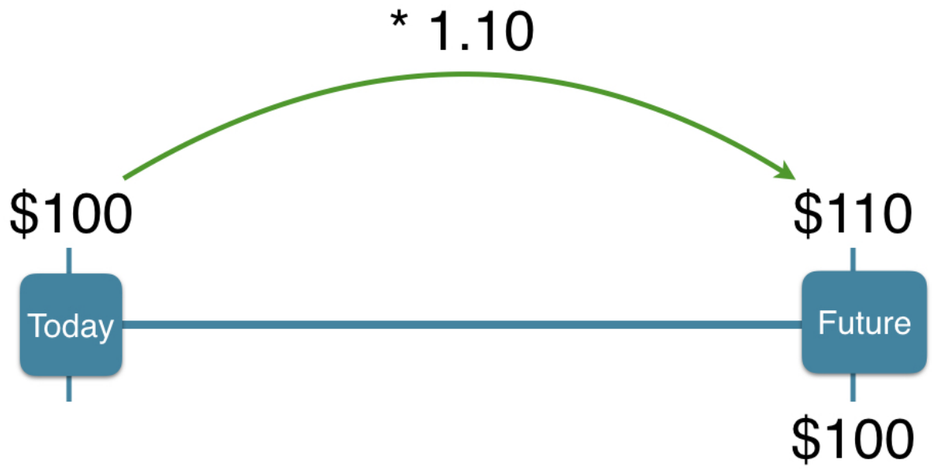
Time value of money



Time value of money



Time value of money



Future value and present value

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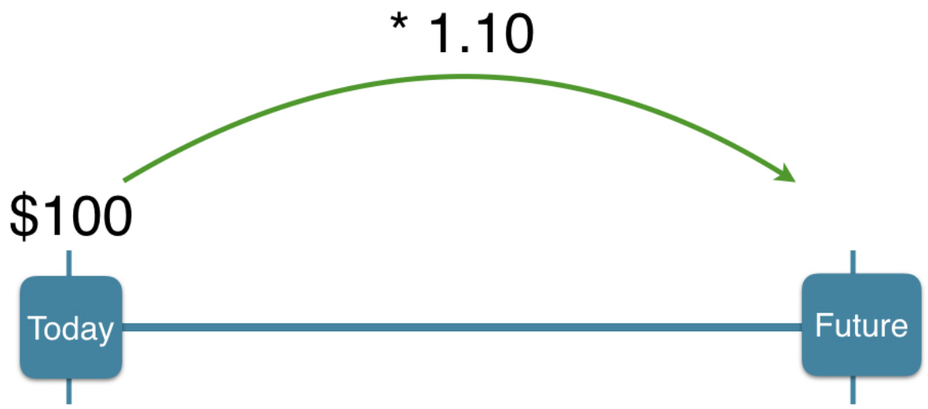
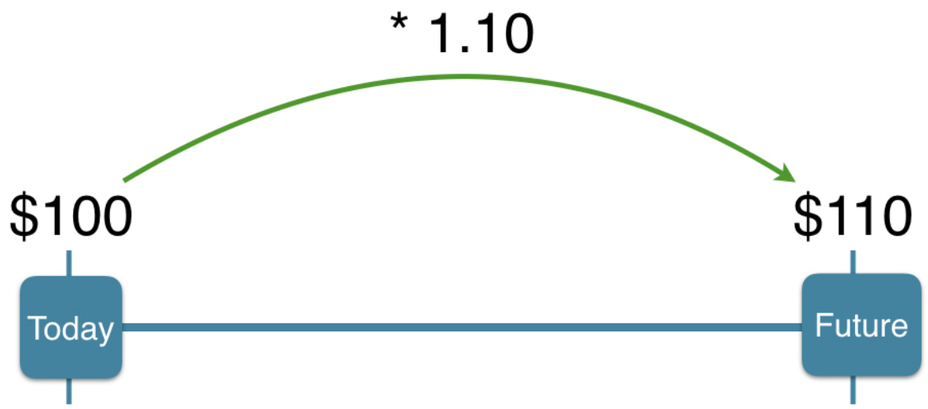
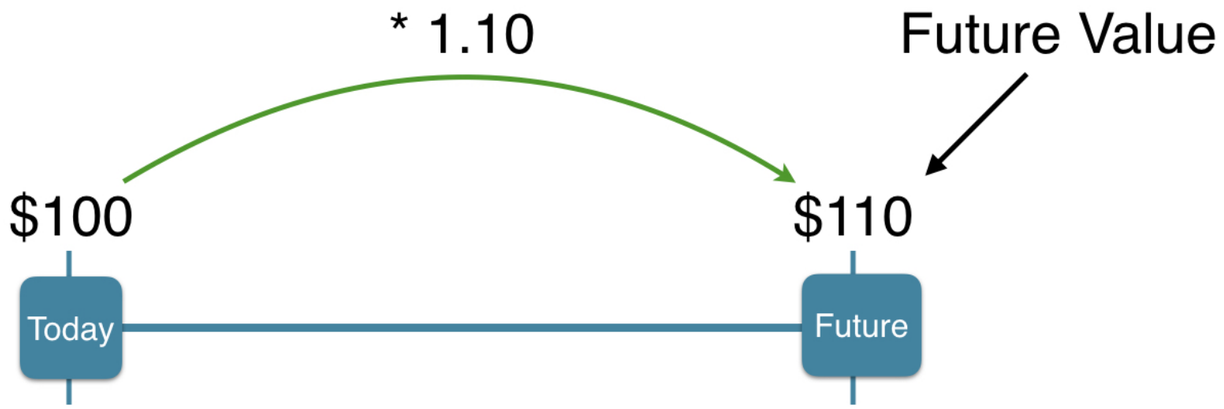


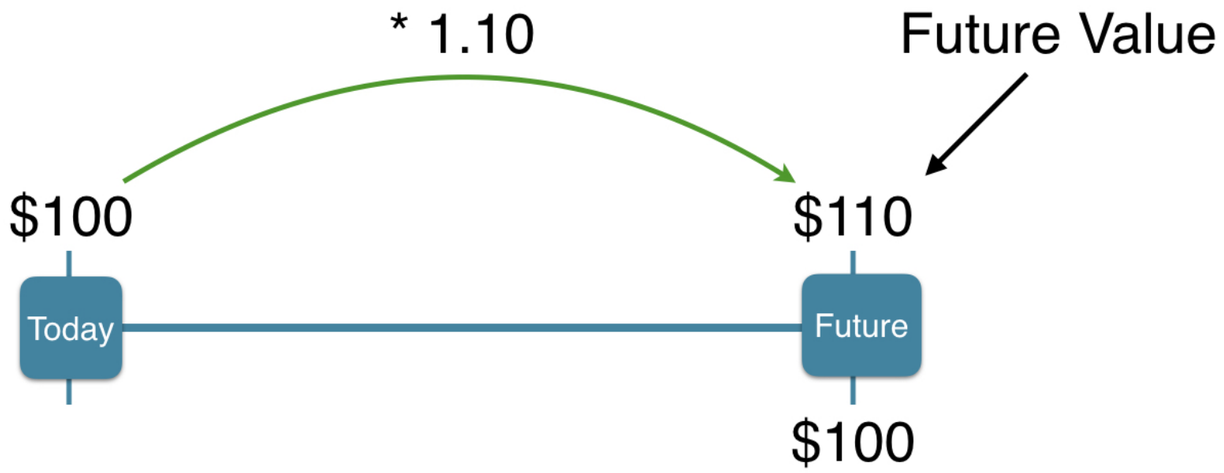
Future value and present value



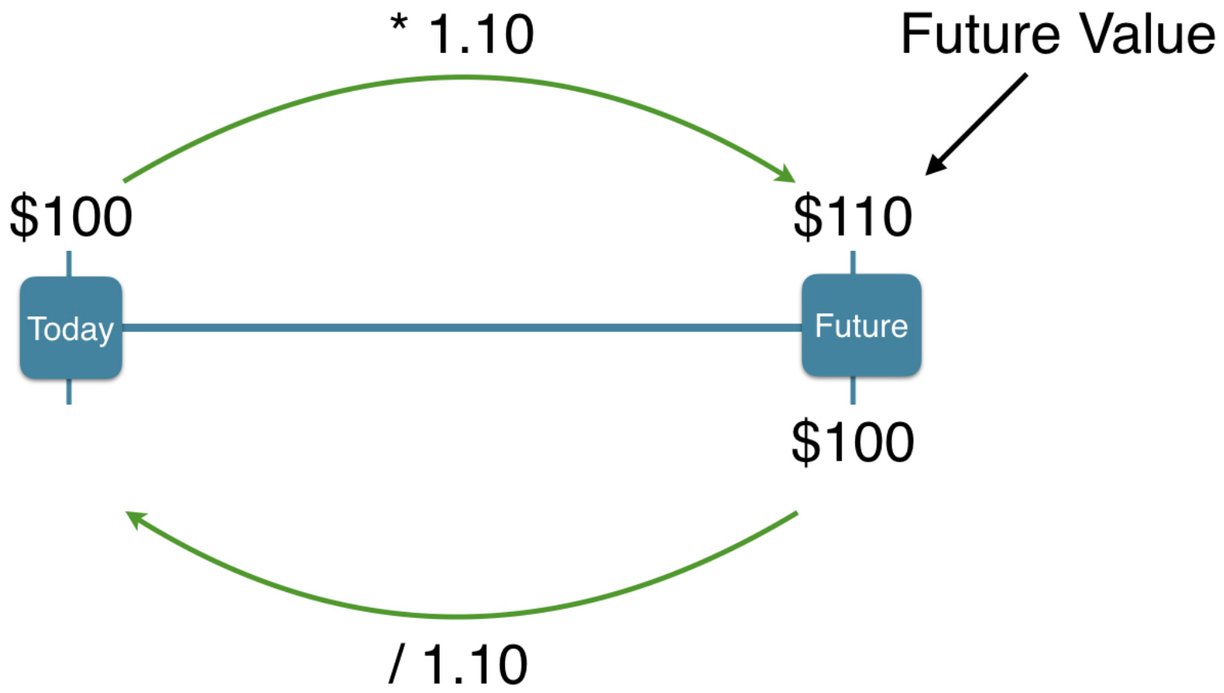
Future value and present value



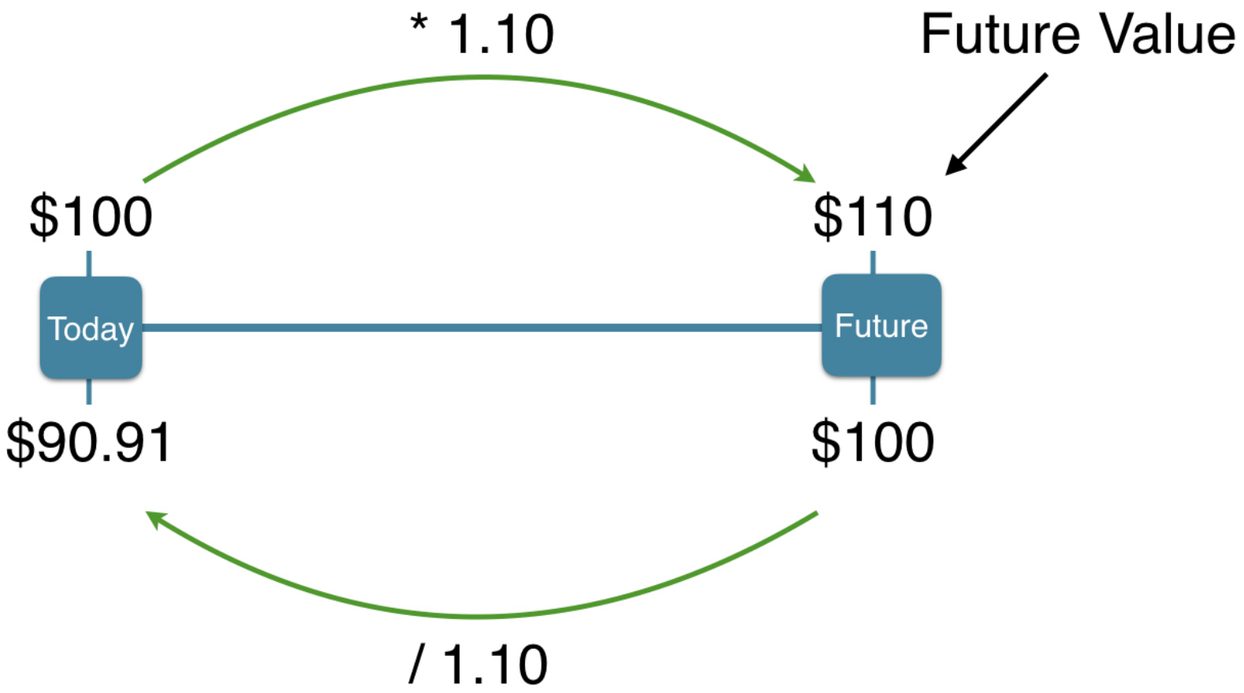
Future value and present value



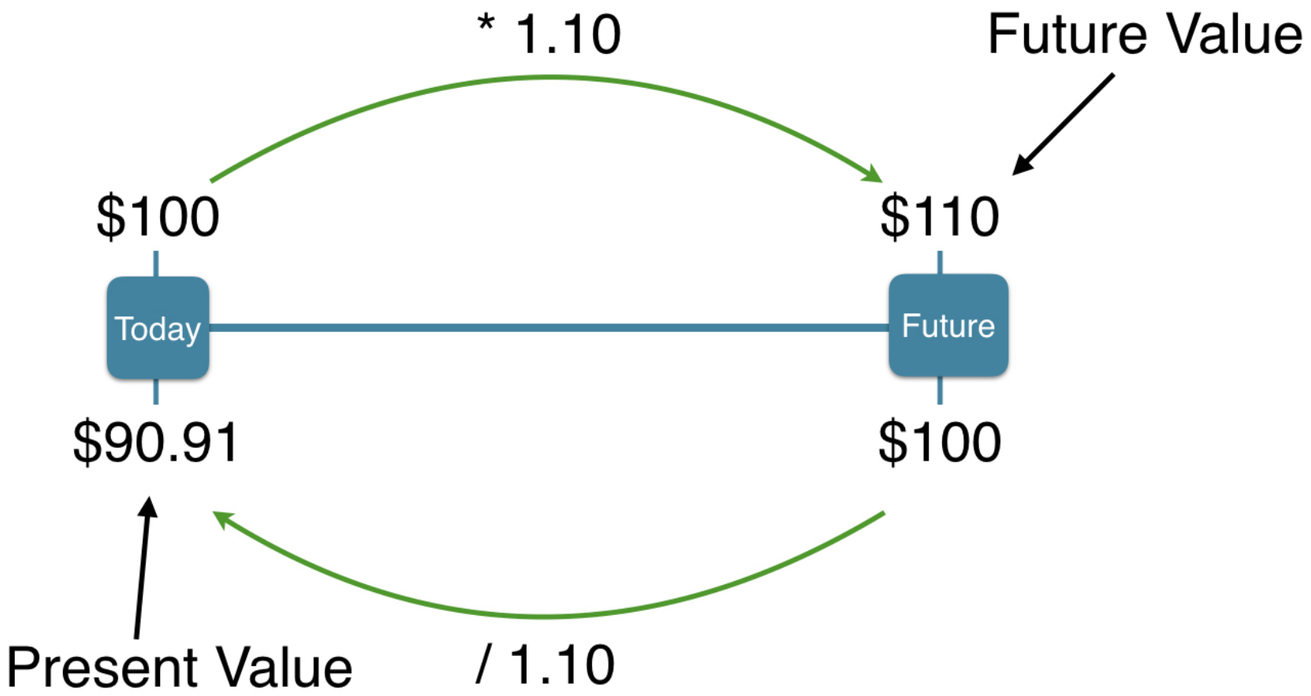
Future value and present value



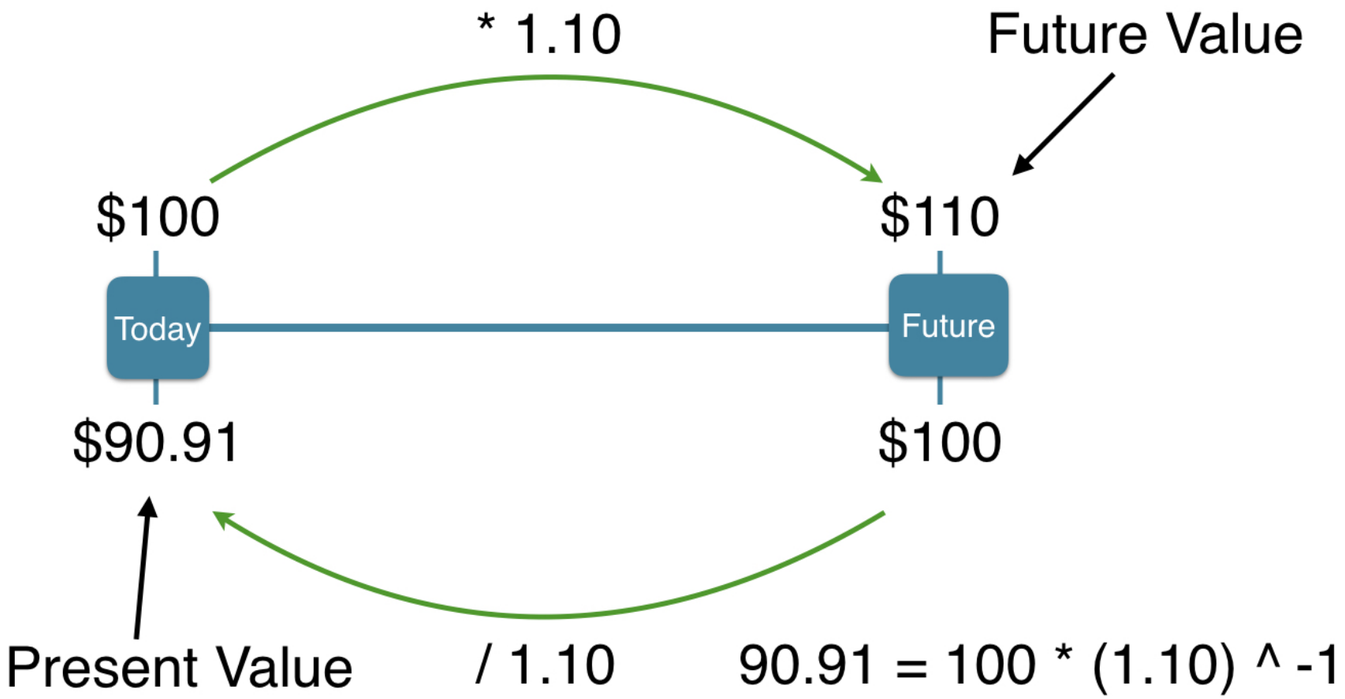
Future value and present value



Future value and present value



Future value and present value



Present value - multiple periods

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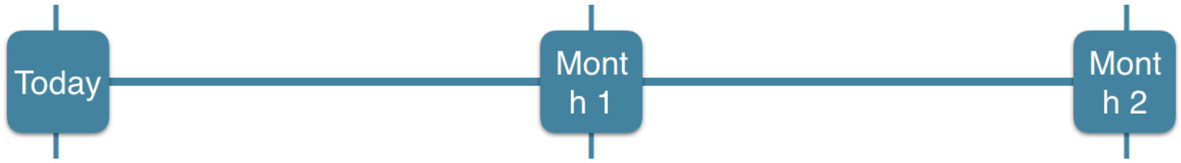
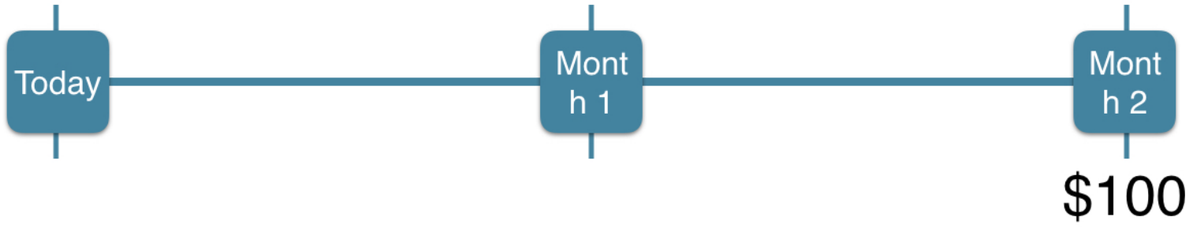
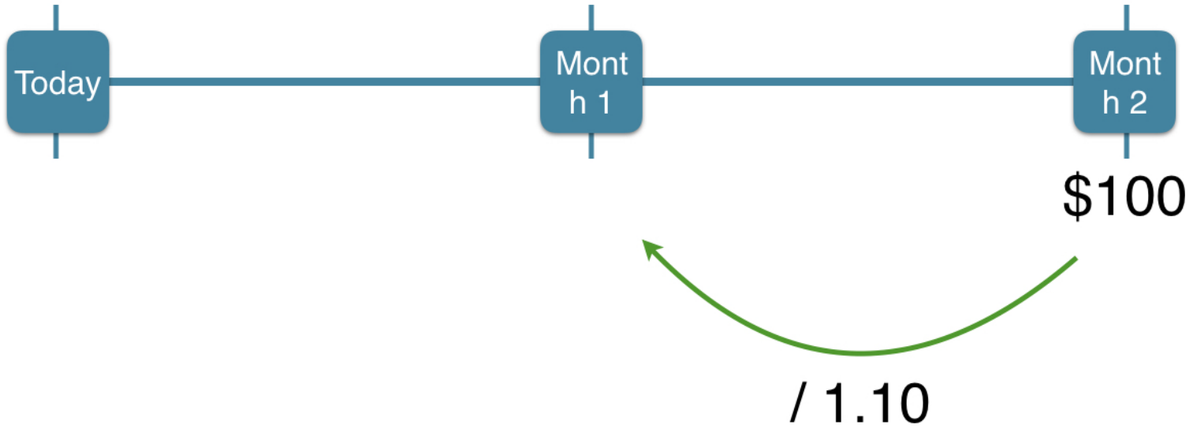


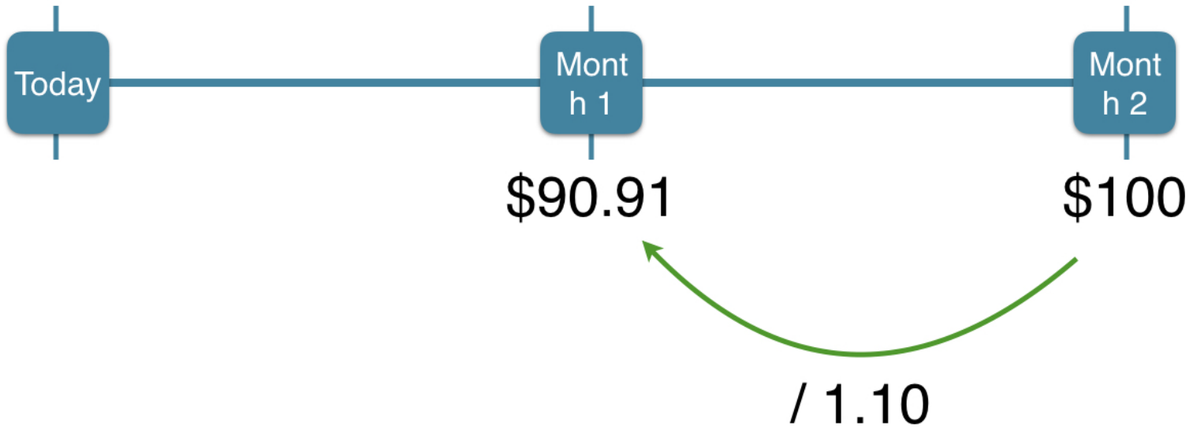
Present value - multiple periods



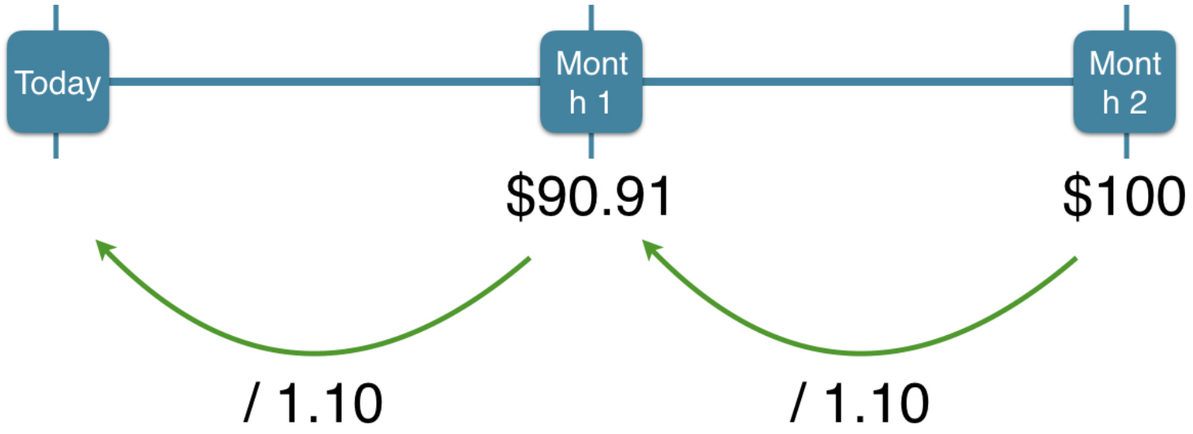
Present value - multiple periods



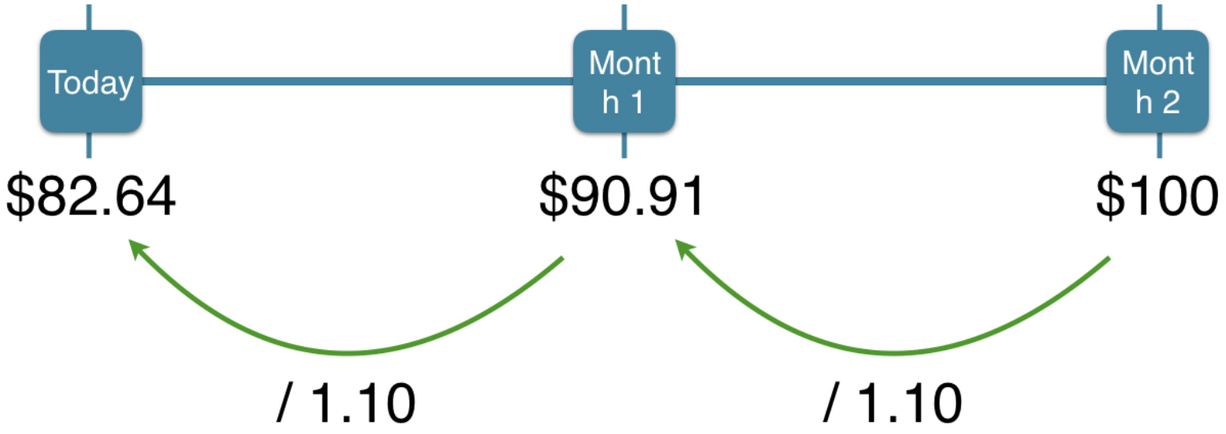
Present value - multiple periods



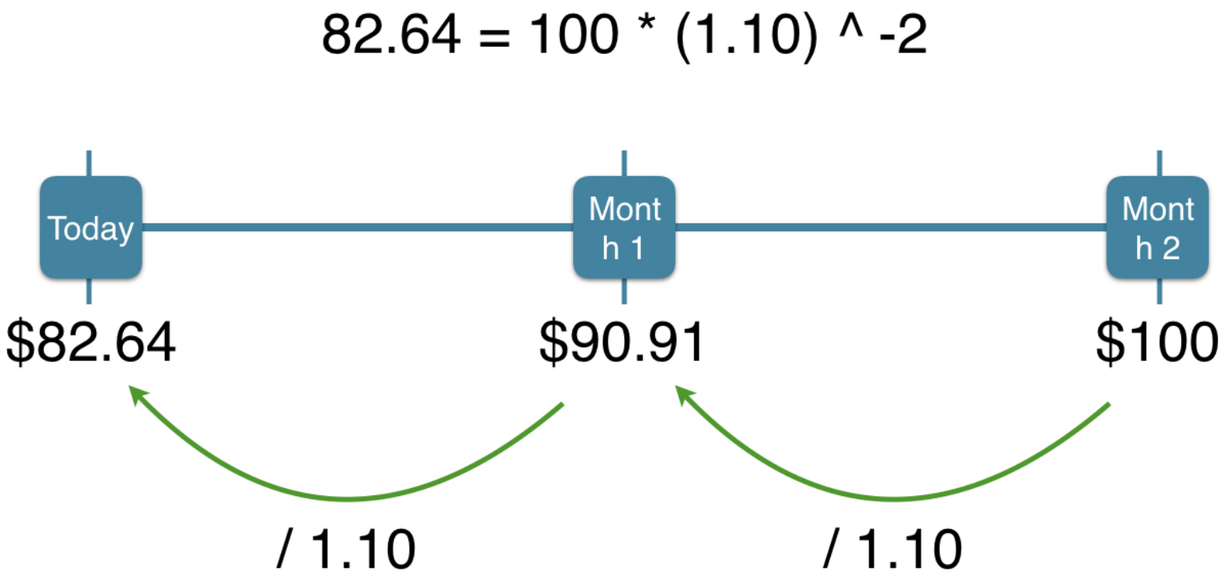
Present value - multiple periods



Present value - multiple periods



Present value - multiple periods



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
```

```
82.64463
```

Let's practice!

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