Lecture 3, Module 5: Vectors

Exercises

```
load( "Module 5 R Objects.Rdata" )
```

Exercises

Exercise 5.1: Creating a named vector

A grocery store sells three brands of breakfast cereal:

- Sugar Bomz (SBZ), which sells for $2.99 per box.
- Krispee Yummm (KYM), which sells for $3.49 per box.
- Healthy Kale and Tofu (HKT), which sells for $7.99 per box.

Let's make a table of these brands and their price:

Brand	Price
SBZ	2.99
KYM	3.49
HKT	7.99

Create a named vector that associates brand names with prices.

Solution

```
# Type your answer here
```

Exercise 5.2: Character Indexing

Suppose the grocery store sells this sequence of breakfast cereals:

- One box of Sugar Bomz (SBZ).
- One box of Krispee Yummm (KYM).
- One box of Sugar Bomz (SBZ).
- One box of Healthy Kale and Tofu (HKT).
- One box of Sugar Bomz (SBZ).

Create a vector of character strings to represent this sequence of sales, and then convert it to a numeric vector of the price per box of the brand by constructing a lookup vector.

Solution

Exercise 5.3: Grocery Store

Let's return to our grocery store example.

Recall that these were the prices per box for each brand of breakfast cereal:

Brand	Price
SBZ	2.99
KYM	3.49
HKT	7.99

Also, recall that we had this sequence of sales:

- One box of Sugar Bomz (SBZ).
- One box of Krispee Yummm (KYM).
- One box of Sugar Bomz (SBZ).
- One box of Healthy Kale and Tofu (HKT).
- One box of Sugar Bomz (SBZ).

Calculate the total sales amount for the day by looking up the price for each box and then adding up the values in the vector using the `sum()` function.

Solution

Exercise 5.4: Grocery Store

The R object `cereal.sales.vector` contains data on cereal sales.

As with the previous exercise, your goal is to calculate the total sales amount for this data.

First, determine the number of entries in this vector, and convince yourself that it would be a lot of work to examine each entry individually.

Then use the `unique()` function to see all the different labels in this data.

Construct a lookup vector to repair any incorrect entries, and then use the vector of repaired values to calculate the total sales amount.

Solution

Solutions to the Exercises

Exercise 5.1: Creating a named vector

A grocery store sells three brands of breakfast cereal:

- Sugar Bomz (SBZ), which sells for $2.99 per box.
- Krispee Yummm (KYM), which sells for $3.49 per box.
- Healthy Kale and Tofu (HKT), which sells for $7.99 per box.

Let's make a table of these brands and their price:

Brand	Price
SBZ	2.99
KYM	3.49
HKT	7.99

Create a named vector that associates brand names with prices.

Solution

```
breakfast.cereal.price.lookup.vector <-
    c(
        "SBZ" = 2.99,
        "KYM" = 3.49,
        "HKT" = 7.99
    )
```

Now let's display this vector:

```
breakfast.cereal.price.lookup.vector
```

```
##  SBZ  KYM  HKT
## 2.99 3.49 7.99
```

Exercise 5.2: Character Indexing

Suppose the grocery store sells this sequence of breakfast cereals:

- One box of Sugar Bomz (SBZ).
- One box of Krispee Yummm (KYM).
- One box of Sugar Bomz (SBZ).
- One box of Healthy Kale and Tofu (HKT).
- One box of Sugar Bomz (SBZ).

Create a vector of character strings to represent this sequence of sales, and then convert to a numeric vector of the price per box of the brand.

Solution

Let's start by creating the vector representing the sales, using a character string format:

```
breakfast.cereal.sales.vector <-
    c(
        "SBZ", "KYM", "SBZ", "HKT", "SBZ"
    )
```

Now let's convert that to a vector of prices per box:

```
breakfast.cereal.prices.vector <-
    breakfast.cereal.price.lookup.vector[
        breakfast.cereal.sales.vector
    ]

breakfast.cereal.prices.vector
```

```
##  SBZ  KYM  SBZ  HKT  SBZ
## 2.99 3.49 2.99 7.99 2.99
```

Exercise 5.3: Grocery Store

Let's return to our grocery store example.

Recall that these were the prices per box for each brand of breakfast cereal:

Brand	Price
SBZ	2.99
KYM	3.49
HKT	7.99

Also, recall that we had this sequence of sales:

- One box of Sugar Bomz (SBZ).
- One box of Krispee Yummm (KYM).
- One box of Sugar Bomz (SBZ).
- One box of Healthy Kale and Tofu (HKT).
- One box of Sugar Bomz (SBZ).

Calculate the total sales amount for the day by looking up the price for each box and then adding up the values in the vector using the `sum()` function.

Solution

First, we'll lookup the prices (we did this in the previous problem) and then we'll add these using the `sum()` function to obtain the total sales amount:

```
breakfast.cereal.prices.vector <-
    breakfast.cereal.price.lookup.vector[
        breakfast.cereal.sales.vector
    ]

total.breakfast.cereal.sales <-
    sum( breakfast.cereal.prices.vector )

cat(
    "Total sales:",
    formatC(
        total.breakfast.cereal.sales,
```

```
        format = "f",
        digits = 2
    )
)
```

```
## Total sales: 20.45
```

Exercise 5.4: Grocery Store

The R object `incorrect.values.cereal.sales.vector` contains data on cereal sales, but it has some incorrect values.

As with the previous exercise, your goal is to calculate the total sales amount for this data.

First, determine the number of entries in this vector, and convince yourself that it would be a lot of work to examine each entry individually.

Then use the `unique()` function to see all the different labels in this data.

Construct a lookup vector to repair any incorrect entries, and then use the vector of repaired values to calculate the total sales amount.

Solution

Let's see how many items are in this vector:

```
length( incorrect.values.cereal.sales.vector )
```

```
## [1] 10000
```

How many unique values are there in this vector?

```
unique( incorrect.values.cereal.sales.vector )
```

```
## [1] "SBZ" "KYM" "hkt" "HKT" "sbz" "kym"
```

Now we'll create the lookup vector to repair the incorrect values:

```
repair.cereal.sales.lookup.vector <-
  c(
    "SBZ" = "SBZ",
    "KYM" = "KYM",
    "HKT" = "HKT",
    "sbz" = "SBZ",
    "kym" = "KYM",
    "hkt" = "HKT"
  )
```

Now we can repair the values in this vector:

```
repaired.cereal.sales.vector <-
  repair.cereal.sales.lookup.vector[
    incorrect.values.cereal.sales.vector
  ]
```

We can convert the repaired values to numeric values:

```
cereal.sales.numeric.vector <-
  breakfast.cereal.price.lookup.vector[
    repaired.cereal.sales.vector
  ]
```

Finally, we can add everything up to obtain the total sales amount:

```
total.cereal.sales.amount <-
  sum( cereal.sales.numeric.vector )

cat(
  "Total cereal sales:",
  formatC(
    total.cereal.sales.amount,
    format = "f",
    digits = 2,
    big.mark = ","
  )
)
```

```
## Total cereal sales: 36,360.00
```