Working With Matrices: Takeaways

Syntax

NAMING MATRIX ROWS AND COLUMNS

- Assign name attributes to rows of a matrix:

```
rownames(matrix)
```

- Assign name attributes to columns of a matrix:

```
colnames(matrix)
```

MATRIX OPERATIONS

- Finding Matrix Dimensions

```
dim(math_chemistry)
```

- Combining Vectors or Matrices by Row

```
rbind(matrix_1, matrix_2)

rbind(vector_1, vector_2)

rbind(vector_1, matrix_1)
```

- Combining Vectors or Matrices by Column

```
cbind(matrix_1, matrix_2)

cbind(vector_1, vector_2)

cbind(vector_1, matrix_1)
```

INDEXING MATRICES BY ELEMENT

- Extract a single element:

```
matrix[2,5]

 matrix["Stanford","patents"]
```

- Extract multiple elements:

```
matrix[c(1,2),c(1,3)]

matrix[c("Harvard","Stanford"),c("world_rank","influence")]
```

INDEXING MATRICES BY ROWS AND COLUMNS

- Extract a single row:

```
matrix[1,]

matrix["Harvard",]
```

- Extract a single column:

```
matrix[,2]

matrix[,"quality_of_education"]
```

- Extract multiple rows or columns:

```
matrix[,c("quality_of_education","influence","broad_impact")]

matrix[,c("2,3,4")]
```

RANK VALUES OF A VECTOR OR SUBSET OF A MATRIX

- Rank values of a vector:

```
rank(vector)
```

- Rank values of a matrix:

```
rank(matrix[,"column"])

rank(matrix["row",])
```

CALCULATE THE SUM OF VALUES IN A VECTOR OR MATRIX

- Sum of values in a vector:

```
sum(vector)
```

- Sum of values in a matrix:

```
sum(matrix[,"column"])

 sum(matrix["row",])
```

Concepts

- Like vectors, matrices only contain one data type. Unlike vectors, they are two-dimensional.
- When adding a vector to a matrix, it's good practice to make sure the new vector is the same length as the number of rows or columns in the matrix.

Resources

- Documentation on indexing matrices in R