

Module 11

# TABLES

CS 106 Winter 2019



# Discover Weekly

Your weekly mixtape of fresh music. Enjoy new discoveries and deep cuts chosen just for you. Updated every Monday, so save your favourites!

Created by: Spotify • 30 songs, 2 hr 36 min

PAUSE

FOLLOWING



FOLLOWER  
1

Filter

Download

	SONG	ARTIST	ALBUM		
+	Ways To Go - Margot Mix	Weval, Margot	Weval Remix	11 hours ago	7:11
+	Death Is A Girl	Mini Mansions	The Great Preten...	11 hours ago	4:36
+	Jumbo	Underworld	Beaucoup Fish	11 hours ago	6:58
+	Bug Powder Dust	The Mysterons	Meandering	11 hours ago	4:27
+	...To Have No Answer	Flock of Dimes	If You See Me, Sa...	11 hours ago	3:49
+	I'll Cut You Down	Uncle Acid & The...	Blood Lust	11 hours ago	5:02
+	L'enfer ce n'est pas les autres c'est moi	The Eye Of Time	Myth I: A Last Da...	11 hours ago	5:46
+	Terrain	pg.lost	Key	11 hours ago	5:29



2:46

3:54

N7

=

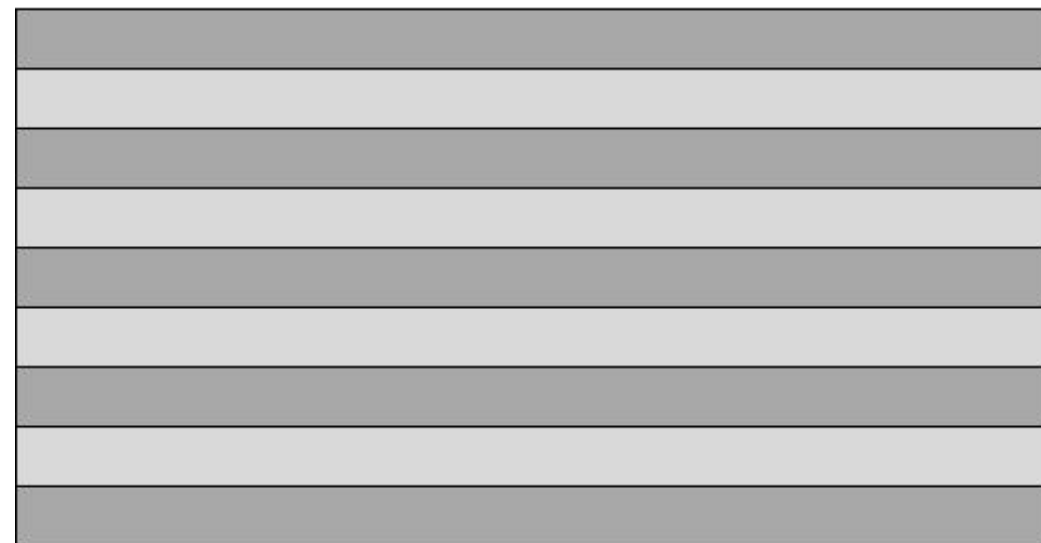
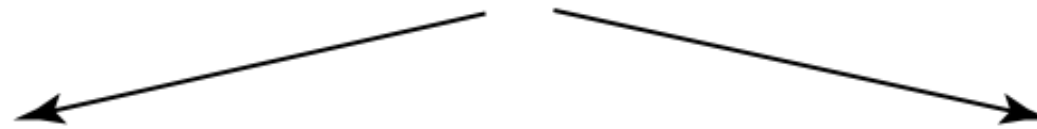
=VLOOKUP(M7,grades,2)

Workbook2

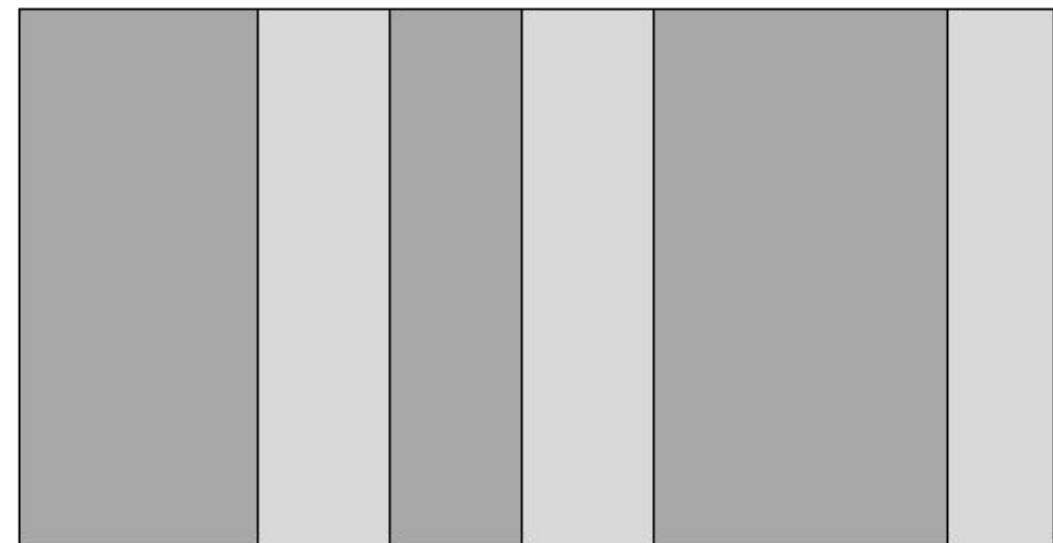
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	0	F												
2	70	D												
3	76	C												
4	86	B												
5	93	A												
6			<b>Name</b>	T1	T2	T3	P1	P2	H1	H2	H3	H4	Avg	Grade
7			Ann	89	78	100	88	92	100	95	78	88	90	B
8			Bill	68	87	72	60	80	65	100	50	42	72	D
9			Carol	98	87	100	78	99	80	100	88	95	91	B
10			Doug	78	68	92	88	76	95	99	88	72	82	C
11			Elaine	89	78	100	88	92	100	95	78	88	90	B
12			Frank	79	69	97	95	82	99	93	75	78	85	C
13			Gloria	98	87	100	78	99	80	100	88	95	91	B
14			Howard	78	68	92	88	76	95	99	88	72	82	C
15			Imogene	89	78	100	88	92	100	95	78	88	90	B
16			John	62	78	76	72	60	70	60	78	88	69	F
17			Kesha	79	69	97	95	83	99	93	75	78	86	C
18														
19			T 1-3 = tests 1-3				Tests = 40%							
20			P 1-2 = projects 1-2				Projects = 50 %							
21			H 1-4 = homework 1-4				Homework = 10 %							
22														

	<b>Hair</b>	<b>Eye</b>	<b>Sex</b>	<b>Freq</b>
1	Black	Brown	Male	32
2	Brown	Brown	Male	53
3	Red	Brown	Male	10
4	Blond	Brown	Male	3
5	Black	Blue	Male	11
6	Brown	Blue	Male	50
7	Red	Blue	Male	10
8	Blond	Blue	Male	30
9	Black	Hazel	Male	10
10	Brown	Hazel	Male	25

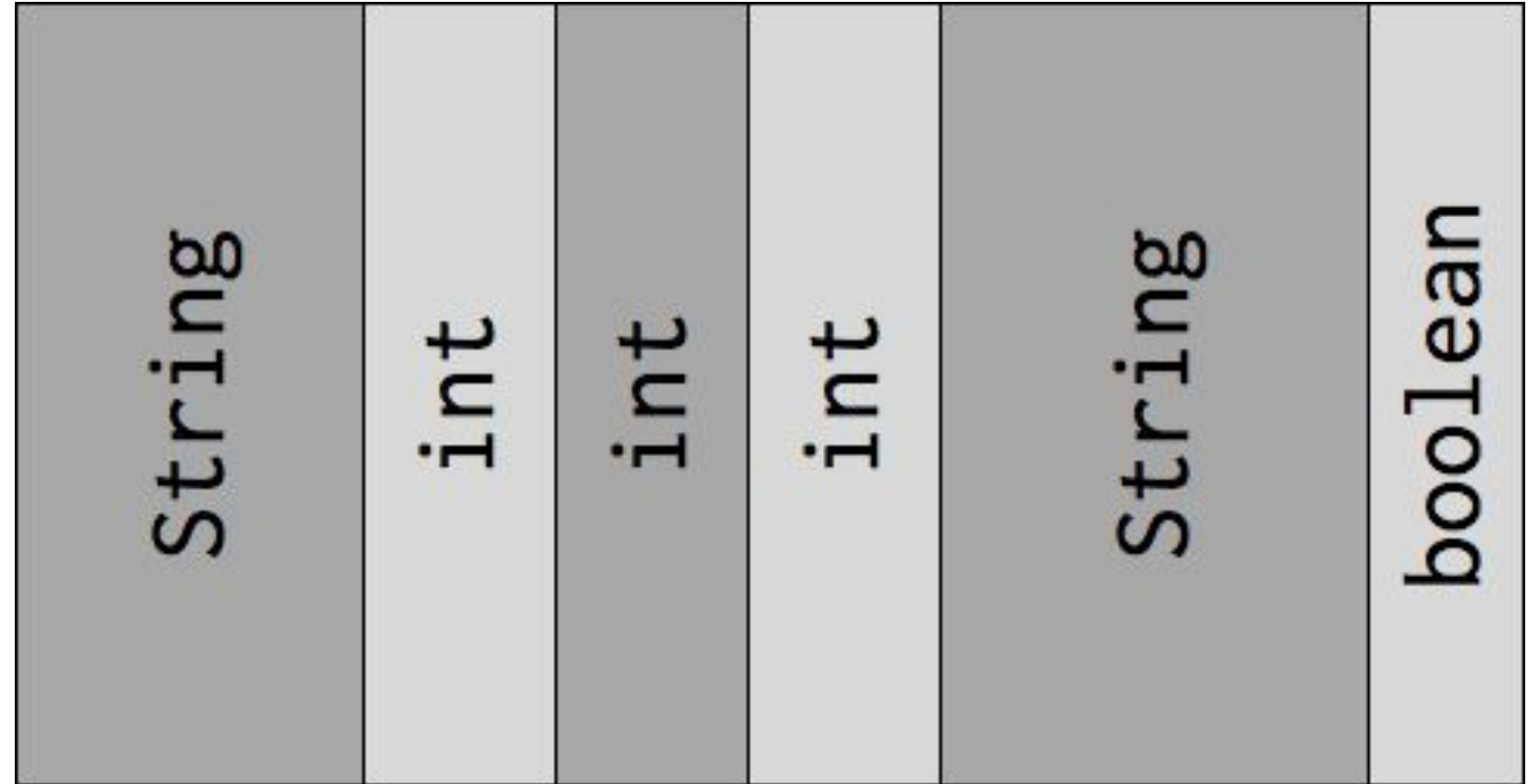
A table is a grid. Each row is a *record*, and each column is a *field*. We can think of the table as a **sequence of records**.

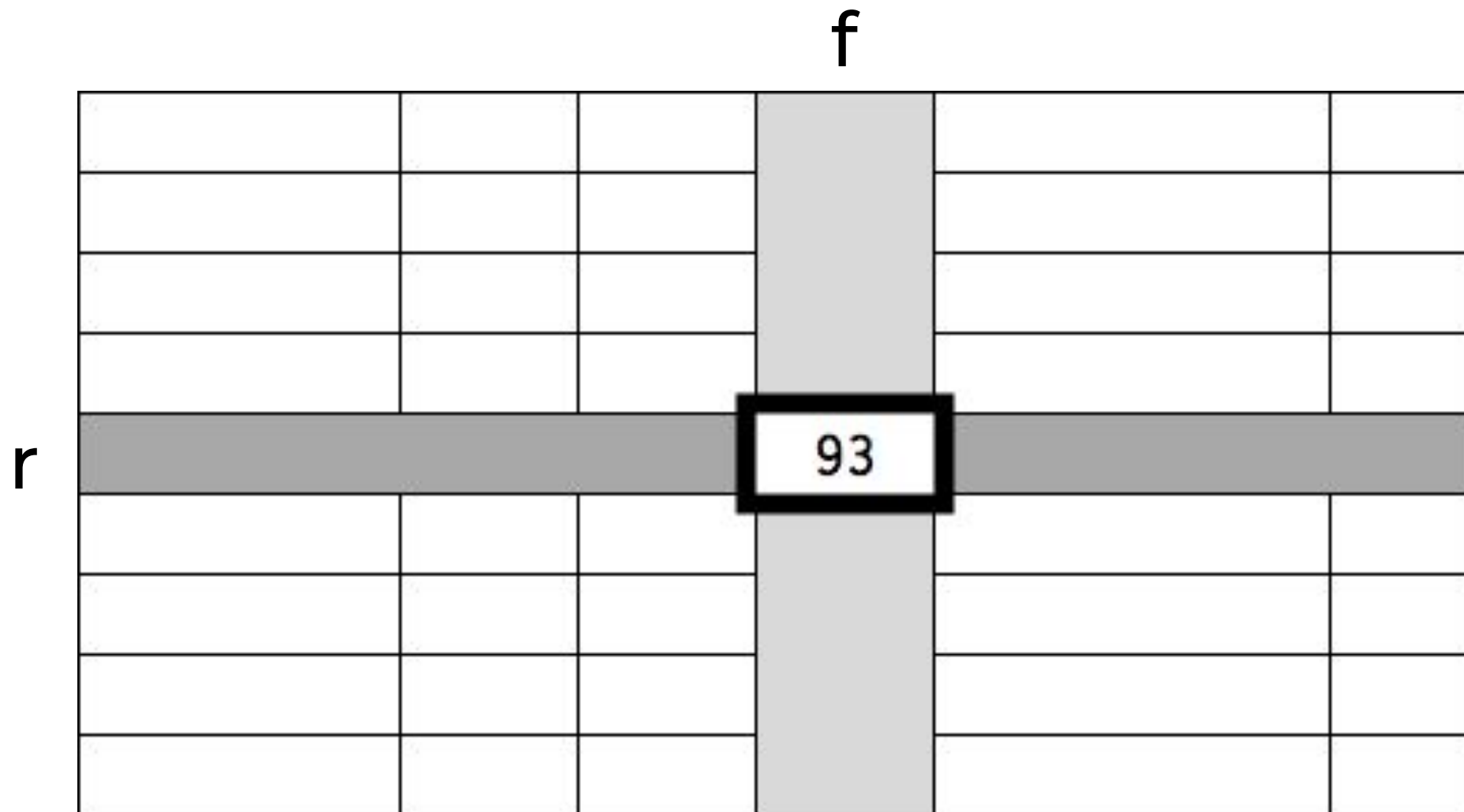
Records



Fields

All values in a given field have the same type, but different fields can have different types.



A *cell* holds one record's value for one field. A cell's location is "two-dimensional"—it takes two values to describe its location.



The image shows a screenshot of an Excel spreadsheet. The active cell is D4, which contains the text 'Male'. The formula bar above the spreadsheet also displays 'Male'. The spreadsheet contains the following data:

	A	B	C	D	E	F
1		1 Black	Brown	Male	32	
2		2 Brown	Brown	Male	53	
3		3 Red	Brown	Male	10	
4		4 Blond	Brown	Male	3	
5		5 Black	Blue	Male	11	
6		6 Brown	Blue	Male	50	
7		7 Red	Blue	Male	10	
8		8 Blond	Blue	Male	30	
9		9 Black	Hazel	Male	10	
10		10 Brown	Hazel	Male	25	
11						



	SONG	ARTIST	ALBUM		
+	Ways To Go - Margot Mix	Weval, Margot	Weval Remix	11 hours ago	7:11
+	Death Is A Girl	Mini Mansions	The Great Preten...	11 hours ago	4:36
+	Jumbo	Underworld	Beaucoup Fish	11 hours ago	6:58
+	Bug Powder Dust	The Mysterons	Meandering	11 hours ago	4:27

Name	T1	T2	T3	P1	P2	H1	H2	H3	H4	Avg	Grade
Ann	89	78	100	88	92	100	95	78	88	90	B
Bill	68	87	72	60	80	65	100	50	42	72	D
Carol	98	87	100	78	99	80	100	88	95	91	B
Doug	78	68	92	88	76	95	99	88	72	82	C

Some tables have “header rows” that give names to the fields.

# Representing Tables

Worst idea: one array per field

Name	T1	T2	T3	P1	P2	H1	H2	H3	H4	Avg	Grade
Ann	89	78	100	88	92	100	95	78	88	90	B
Bill	68	87	72	60	80	65	100	50	42	72	D
Carol	98	87	100	78	99	80	100	88	95	91	B
Doug	78	68	92	88	76	95	99	88	72	82	C
Elaine	89	78	100	88	92	100	95	78	88	90	B
Frank	79	69	97	95	82	99	93	75	78	85	C
Gloria	98	87	100	78	99	80	100	88	95	91	B
Howard	78	68	92	88	76	95	99	88	72	82	C
Imogene	89	78	100	88	92	100	95	78	88	90	B
John	62	78	76	72	60	70	60	78	88	69	F
Kesha	79	69	97	95	83	99	93	75	78	86	C

```
String[] Name_field = { "Ann", "Bill", "Carol", ... };
```

```
int[] T1_field = { 89, 68, 98, 78, ... };
```

```
int[] T2_field = { 78, 87, 87, 68, ... };
```

```
int[] P1_field = { 88, 60, 78, 88, ... };
```

...

# Representing Tables

Slightly better: an array of instances of a Record class.

```
class Record
{
    String name;
    int T1;
    int T2;
    int T3;
    ...
}

Record[] grades;
```

Name	T1	T2	T3	P1	P2	H1
Ann	89	78	100	88	92	100
Bill	68	87	72	60	80	65
Carol	98	87	100	78	99	80
Doug	78	68	92	88	76	95
Elaine	89	78	100	88	92	100
Frank	79	69	97	95	82	99
Gloria	98	87	100	78	99	80
Howard	78	68	92	88	76	95
Imogene	89	78	100	88	92	100
John	62	78	76	72	60	70
Kesha	79	69	97	95	83	99



# Representing Tables

Best: let someone else do it

Composite

Array

ArrayList

FloatDict

FloatList

HashMap

IntDict

IntList

JSONArray

JSONObject

Object

String

StringDict

StringList

Table

TableRow

XML



keyPressed()

keyReleased()

keyTyped()

Files

BufferedReader

createInput()

createReader()

launch()

loadBytes()

loadJSONArray()

loadJSONObject()

loadStrings()

loadTable()

loadXML()

parseJSONArray()

parseJSONObject()

parseXML()

# Comma-separated values

CSV: a standard, simple text-based file format for tabular data.

```
"1", "Black", "Brown", "Male", 32  
"2", "Brown", "Brown", "Male", 53  
"3", "Red", "Brown", "Male", 10  
"4", "Blond", "Brown", "Male", 3  
"5", "Black", "Blue", "Male", 11  
"6", "Brown", "Blue", "Male", 50  
"7", "Red", "Blue", "Male", 10  
"8", "Blond", "Blue", "Male", 30  
"9", "Black", "Hazel", "Male", 10  
"10", "Brown", "Hazel", "Male", 25
```

1	Black	Brown	Male	32
2	Brown	Brown	Male	53
3	Red	Brown	Male	10
4	Blond	Brown	Male	3
5	Black	Blue	Male	11
6	Brown	Blue	Male	50
7	Red	Blue	Male	10
8	Blond	Blue	Male	30
9	Black	Hazel	Male	10
10	Brown	Hazel	Male	25



playerID,birthYear,birthMonth,birthDay,birthCountry,birthState,birthCity,deathYe  
aardsda01,1981,12,27,USA,CO,Denver,,,,,David,Aardsma,David Allan,215,75,R,R,20  
aaronha01,1934,2,5,USA,AL,Mobile,,,,,Hank,Aaron,Henry Louis,180,72,R,R,1954-04  
aaronto01,1939,8,5,USA,AL,Mobile,1984,8,16,USA,GA,Atlanta,Tommie,Aaron,Tommie Le  
aasedo01,1954,9,8,USA,CA,Orange,,,,,Don,Aase,Donald William,190,75,R,R,1977-07  
abadan01,1972,8,25,USA,FL,Palm Beach,,,,,Andy,Abad,Fausto Andres,184,73,L,L,20  
abadfe01,1985,12,17,D.R.,La Romana,La Romana,,,,,Fernando,Abad,Fernando Antoni  
abadijo01,1850,11,4,USA,PA,Philadelphia,1905,5,17,USA,NJ,Pemberton,John,Abadie,J  
abbated01,1877,4,15,USA,PA,Latrobe,1957,1,6,USA,FL,Fort Lauderdale,Ed,Abbatich  
abbeybe01,1869,11,11,USA,VT,Essex,1962,6,11,USA,VT,Colchester,Bert,Abbey,Bert Wo  
abbeych01,1866,10,14,USA,NE,Falls City,1926,4,27,USA,CA,San Francisco,Charlie,Ab  
abbotda01,1862,3,16,USA,OH,Portage,1930,2,13,USA,MI,Ottawa Lake,Dan,Abbott,Leand  
abbotfr01,1874,10,22,USA,OH,Versailles,1935,6,11,USA,CA,Los Angeles,Fred,Abbott,  
abbotgl01,1951,2,16,USA,AR,Little Rock,,,,,Glenn,Abbott,William Glenn,200,78,R  
abbotje01,1972,8,17,USA,GA,Atlanta,,,,,Jeff,Abbott,Jeffrey William,190,74,R,L,  
abbotji01,1967,9,19,USA,MI,Flint,,,,,Jim,Abbott,James Anthony,200,75,L,L,1989-  
abbotku01,1969,6,2,USA,OH,Zanesville,,,,,Kurt,Abbott,Kurt Thomas,180,71,R,R,19  
abbotky01,1968,2,18,USA,MA,Newburyport,,,,,Kyle,Abbott,Lawrence Kyle,200,76,L,  
abbotod01,1888,9,5,USA,PA,New Eagle,1933,4,13,USA,DC,Washington,Ody,Abbott,Ody C  
abbotpa01,1967,9,15,USA,CA,Van Nuys,,,,,Paul,Abbott,Paul David,185,75,R,R,1990  
aberal01,1927,7,31,USA,OH,Cleveland,1993,5,20,USA,OH,Garfield Heights,Al,Aber,Al

```
Table my_table = loadTable( "filename.csv" );
```

Read CSV data from a file, create a new Table instance to store it.

```
Table my_table = loadTable(  
    "filename.csv", "tsv" );
```

Same, but use tab-separated values.

```
Table my_table = loadTable(  
    "filename.csv", "header" );
```

Treat the first line as a header row.

```
Table my_table = loadTable(  
    "filename.csv", "header, tsv" );
```

Both options.

```
Table my_table = loadTable( "filename.csv" );
```

Read CSV data from a file, create a new Table instance to store it.

```
Table my_table = loadTable(  
    "filename.csv", "tsv" );
```

Same, but use tab-separated values.

```
Table my_table = loadTable(  
    "filename.csv", "header" );
```

Treat the first line as a header row.

```
Table my_table = loadTable(  
    "filename.csv", "header, tsv" );
```

Both options.



# Reading cells

To read a cell value, you need to know **three** things about it:

1. The record: what **row** is the cell in?
2. The field: what **column** is the cell in?
3. What **type** of data do you expect to find there?

1	Black	Brown	Male	32
2	Brown	Brown	Male	53
3	Red	Brown	Male	10
4	Blond	Brown	Male	3
5	Black	Blue	Male	11
6	Brown	Blue	Male	50
7	Red	Blue	Male	10
8	Blond	Blue	Male	30
9	Black	Hazel	Male	10
10	Brown	Hazel	Male	25

# Column

# Row

	0	1	2	3	4
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

```
String eyes = table.getString( 4, 2 );
```



# Column

	0	1	2	3	4
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

```
String eyes = table.getString( 4, 2 );
```

# Column

Row

	0	1	2	3	4
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

```
int freq = table.getInt( 6, 4 );
```

"", "Hair", "Eye", "Sex", "Freq"

"1", "Black", "Brown", "Male", 32

"2", "Brown", "Brown", "Male", 53

"3", "Red", "Brown", "Male", 10

"4", "Blond", "Brown", "Male", 3

"5", "Black", "Blue", "Male", 11

"6", "Brown", "Blue", "Male", 50

"7", "Red", "Blue", "Male", 10

"8", "Blond", "Blue", "Male", 30

"9", "Black", "Hazel", "Male", 10

"10", "Brown", "Hazel", "Male", 25

# Column

# Row

	0	1	2	3	4
		Hair	Eye	Sex	Freq
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

# Column

# Row

	0	1	2	3	4
		Hair	Eye	Sex	Freq
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

```
String eyes = table.getString( 4, 2 );
```



# Column

**Row**

	0	1	2	3	4
		Hair	Eye	Sex	Freq
0	1	Black	Brown	Male	32
1	2	Brown	Brown	Male	53
2	3	Red	Brown	Male	10
3	4	Blond	Brown	Male	3
4	5	Black	Blue	Male	11
5	6	Brown	Blue	Male	50
6	7	Red	Blue	Male	10
7	8	Blond	Blue	Male	30
8	9	Black	Hazel	Male	10
9	10	Brown	Hazel	Male	25

```
String eyes = table.getString( 4, "Eye" );
```

```
int some_int = table.getInt( 5, 3 );
```

```
int some_int = table.getInt( 5, "field name" );
```

```
float some_float = table.getFloat( 5, 3 );
```

```
float some_float = table.getFloat( 5, "field name" );
```

```
String some_string = table.getString( 5, 3 );
```

```
String some_string = table.getString( 5, "field name" );
```

# Modifying cells

```
table.setInt( 5, 3, 8735 );
```

```
table.setInt( 5, "field name", 8735 );
```

```
table.setFloat( 5, 3, 3.1415 );
```

```
table.setFloat( 5, "field name", 3.1415 );
```

```
table.setString( 5, 3, "Hallux" );
```

```
table.setString( 5, "field name", "Hallux" );
```

# Table characteristics

```
int num_rows = table.getRowCount();
```

```
int num_cols = table.getColumnCount();
```

# Table characteristics

```
int num_rows = table.getRowCount();
```

```
int num_cols = table.getColumnCount();
```

<b>Name</b>	T1	T2	T3	P1	P2	H1	H2	H3	H4	Avg	Grade
Ann	89	78	100	88	92	100	95	78	88	90	B
Bill	68	87	72	60	80	65	100	50	42	72	D
Carol	98	87	100	78	99	80	100	88	95	91	B
Doug	78	68	92	88	76	95	99	88	72	82	C
Elaine	89	78	100	88	92	100	95	78	88	90	B
Frank	79	69	97	95	82	99	93	75	78	85	C
Gloria	98	87	100	78	99	80	100	88	95	91	B
Howard	78	68	92	88	76	95	99	88	72	82	C
Imogene	89	78	100	88	92	100	95	78	88	90	B
John	62	78	76	72	60	70	60	78	88	69	F
Kesha	79	69	97	95	83	99	93	75	78	86	C



# Table characteristics

```
int num_rows = table.getRowCount();
```

```
int num_cols = table.getColumnCount();
```

```
float total = 0;
```

```
for( int idx = 0; idx < table.getRowCount(); ++idx ) {
```

```
    total += table.getInt( idx, "P1" );
```

```
}
```

```
float p1_average = total / table.getRowCount();
```

- Library
  - Recently Added
  - Artists
  - Albums
  - Songs
  - Genres
  - Videos
- Music Playlists
  - Purchased on Hogwall...
  - Genius
  - Movie Trailers
  - Purchased
  - 90's Music
  - Classical Music
  - Music Videos
  - My Top Rated
  - Recently Added
  - Recently Played
  - Top 25 Most Played
  - Alarm
  - Awesome
  - cc
  - Good KEXP songs
  - Internet Songs
  - master
  - OMOM
  - pflh

<input checked="" type="checkbox"/>	Name		Time	Artist	Album	Genre	Plays	Last Played	Date Added
<input checked="" type="checkbox"/>	Reflektor		7:34	Arcade Fire	Reflektor	Alternative	4	2016-06-18, 5:1...	2014-04
<input checked="" type="checkbox"/>	We Exist		5:44	Arcade Fire	Reflektor	Alternative	2	2014-04-24, 5:5...	2014-04
<input checked="" type="checkbox"/>	Flashbulb Eyes		2:42	Arcade Fire	Reflektor	Alternative	2	2014-04-24, 6:0...	2014-04
<input checked="" type="checkbox"/>	Here Comes The Night Time		6:31	Arcade Fire	Reflektor	Alternative	2	2014-04-24, 6:0...	2014-04
<input checked="" type="checkbox"/>	Normal Person		4:22	Arcade Fire	Reflektor	Alternative	20	2015-12-16, 2:3...	2014-04
<input checked="" type="checkbox"/>	You Already Know		3:59	Arcade Fire	Reflektor	Alternative	7	2015-06-11, 11:...	2014-04
<input checked="" type="checkbox"/>	Joan Of Arc		5:24	Arcade Fire	Reflektor	Alternative	7	2015-06-11, 11:...	2014-04
<input checked="" type="checkbox"/>	Digital Booklet - 2013			Arcade Fire	Reflektor	Alternative			2014-04
<input checked="" type="checkbox"/>	Here Comes The Night Time II		2:52	Arcade Fire	Reflektor	Alternative	5	2015-06-11, 11:...	2014-04
<input checked="" type="checkbox"/>	Awful Sound (Oh Eurydice)		6:14	Arcade Fire	Reflektor	Alternative	3	2015-06-11, 11:...	2014-04
<input checked="" type="checkbox"/>	It's Never Over (Oh Orpheus)		6:43	Arcade Fire	Reflektor	Alternative	4	2016-03-31, 6:4...	2014-04
<input checked="" type="checkbox"/>	Porno		6:03	Arcade Fire	Reflektor	Alternative	4	2016-03-31, 6:3...	2014-04
<input checked="" type="checkbox"/>	Afterlife		5:53	Arcade Fire	Reflektor	Alternative	2	2015-06-12, 12:...	2014-04
<input checked="" type="checkbox"/>	Supersymmetry		11:17	Arcade Fire	Reflektor	Alternative	2	2015-06-12, 12:...	2014-04
<input checked="" type="checkbox"/>	Election Day		5:28	Arcadia	So Red the Rose	Rock	5	2016-05-12, 10:...	2005-10
<input checked="" type="checkbox"/>	O'reilly On Advertising Theme		3:02	Ari Posner & Ian L...	The Age of Persua...	Jazz	4	2014-04-27, 9:3...	2009-12
<input checked="" type="checkbox"/>	The Age of Persuasion Theme - ...		3:17	Ari Posner & Ian L...	The Age of Persua...	Jazz	2	2013-08-26, 10:...	2009-12
<input checked="" type="checkbox"/>	The Age of Persuasion Theme - ...		3:13	Ari Posner & Ian L...	The Age of Persua...	Jazz	1	2013-08-26, 10:...	2009-12
<input checked="" type="checkbox"/>	The Age of Persuasion Theme - ...		3:19	Ari Posner & Ian L...	The Age of Persua...	Jazz	1	2013-08-26, 10:...	2009-12
<input checked="" type="checkbox"/>	Before Your Very Eyes...		5:48	Atoms for Peace	Amok	Electronic	7	2013-08-26, 10:...	2013-03
<input checked="" type="checkbox"/>	Default		5:16	Atoms for Peace	Amok	Electronic	31	2014-08-16, 3:4...	2013-03
<input checked="" type="checkbox"/>	Ingenu		4:30	Atoms for Peace	Amok	Electronic	6	2013-08-29, 8:5...	2013-03
<input checked="" type="checkbox"/>	Dropped		4:57	Atoms for Peace	Amok	Electronic	5	2013-07-08, 2:4...	2013-03
<input checked="" type="checkbox"/>	Unless		4:40	Atoms for Peace	Amok	Electronic	5	2013-07-08, 2:4...	2013-03
<input checked="" type="checkbox"/>	Stuck Together Pieces		5:28	Atoms for Peace	Amok	Electronic	6	2014-01-31, 8:0...	2013-03
<input checked="" type="checkbox"/>	Judge Jury and Executioner		3:28	Atoms for Peace	Amok	Electronic	5	2013-07-08, 2:5...	2013-03
<input checked="" type="checkbox"/>	Reverse Running		5:06	Atoms for Peace	Amok	Electronic	5	2013-08-28, 2:1...	2013-03
<input checked="" type="checkbox"/>	Amok		5:25	Atoms for Peace	Amok	Electronic	5	2013-07-08. 3:0...	2013-03
<input checked="" type="checkbox"/>	Orphans								
<input checked="" type="checkbox"/>	Gamma Ray								
<input checked="" type="checkbox"/>	Chemtrails								
<input checked="" type="checkbox"/>	Modern Guilt								
<input checked="" type="checkbox"/>	Youthless								

# Sorting by column



- Library
- Recently Added
- Artists
- Albums
- Songs
- Genres
- Videos
- Music Playlists
- Purchased on Hogwall...
- Genius
- Movie Trailers
- Purchased
- 90's Music
- Classical Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played
- Alarm
- Awesome
- cc
- Good KEXP songs
- Internet Songs
- master
- OMOM
- pflh

<input checked="" type="checkbox"/>	Name		Time	Artist	Album	Genre	Plays	Last Played	Date Added
<input checked="" type="checkbox"/>	One Minute of Music -- April 20...		1:06	Doctor Thingo	One Minute of Mu...		120	2013-11-08, 3:1...	2008-05
<input checked="" type="checkbox"/>	DVNO		3:56	Justice	Justice	Electronic	81	2014-08-16, 4:1...	2008-07
<input checked="" type="checkbox"/>	A New Town		4:01	Field Music	Plumb	Alternative	63	2014-08-16, 3:3...	2012-03
<input checked="" type="checkbox"/>	Everything Up (Zizou)		5:19	Zero 7	Everything Up (Ziz...	Electronic	59	2014-08-16, 4:3...	2009-09
<input checked="" type="checkbox"/>	One Minute of Music -- June 20...		1:51	Doctor Thingo	One Minute of Mu...	Experimen...	55	2013-11-08, 3:1...	2008-07
<input checked="" type="checkbox"/>	One Minute of Music -- May 20...		1:42	Doctor Thingo	One Minute of Mu...	Blues	52	2013-11-08, 3:1...	2008-06
<input checked="" type="checkbox"/>	Dig Gravedigger Dig		4:12	Corb Lund	Cabin Fever (Delu...	Country	48	2015-12-16, 2:4...	2012-10
<input checked="" type="checkbox"/>	D.A.N.C.E. ...		4:02	Justice	Justice	Electronic	48	2013-08-29, 8:0...	2008-07
<input checked="" type="checkbox"/>	The Safety Dance		2:45	Men Without Hats	The Silver Collecti...	Pop	47	2014-08-17, 6:2...	2010-04
<input checked="" type="checkbox"/>	A Christmas Carol (Part 1)		48:10	Patrick Stewart	A Christmas Carol...	Other	47	2013-09-26, 4:3...	2009-12
<input checked="" type="checkbox"/>	Default		3:07	Django Django	Django Django	Electronic	46	2014-08-16, 3:5...	2013-03
<input checked="" type="checkbox"/>	The Way We Get By		2:40	Spoon	Kill the Moonlight	Alternative	46	2016-04-02, 7:4...	2012-05
<input checked="" type="checkbox"/>	Burning Down the House		3:39	The Cardigans & T...	Best of the Cardig...	Pop	44	2014-08-16, 4:4...	2010-05
<input checked="" type="checkbox"/>	Over and Over		5:48	Hot Chip	The Warning	Electronic	44	2014-08-16, 4:0...	2012-05
<input checked="" type="checkbox"/>	The Bones of You		4:49	Elbow	The Seldom Seen...	Alternative	41	2013-11-08, 3:5...	2011-05
<input checked="" type="checkbox"/>	Grounds for Divorce		3:39	Elbow	The Seldom Seen...	Alternative	41	2013-11-08, 4:0...	2011-05
<input checked="" type="checkbox"/>	Retrograde		3:44	James Blake	Overgrown (Delux...	Electronic	41	2014-08-16, 4:2...	2013-11
<input checked="" type="checkbox"/>	Three Ways to Vacuum Your Ho...		3:25	Madrigaia	Pleiades	World Fusi...	41	2013-11-08, 4:1...	2008-08
<input checked="" type="checkbox"/>	The Birds		8:03	Elbow	Build a Rocket Boys!	Alternative	39	2013-11-08, 3:3...	2011-05
<input checked="" type="checkbox"/>	How Low		2:40	José González	In Our Nature	Pop	38	2016-03-31, 6:2...	2011-02
<input checked="" type="checkbox"/>	Eight Pieces for the Left Hand		38:53	J. Robert Lennon	Selected Shorts		37	2013-06-26, 5:4...	2008-06
<input checked="" type="checkbox"/>	Killing for Love		3:03	José González	In Our Nature	Pop	37	2014-02-03, 10:...	2011-02
<input checked="" type="checkbox"/>	Where Have All the Good Peopl...		4:22	Sam Roberts		Rock	37	2014-08-16, 3:3...	2013-01
<input checked="" type="checkbox"/>	Mirrorball		5:50	Elbow	The Seldom Seen...	Alternative	36	2013-11-08, 4:0...	2011-05
<input checked="" type="checkbox"/>	Hands		5:41	Four Tet	Rounds	Electronic	36	2014-03-15, 11:...	2011-05
<input checked="" type="checkbox"/>	Things Can Only Get Better		3:56	Howard Jones	Best of Howard Jo...	Pop	36	2014-08-16, 3:3...	2005-10
<input checked="" type="checkbox"/>	Down the Line (Vocal)		3:11	José González	In Our Nature	Pop	36	2014-02-03, 9:1...	2011-02
<input checked="" type="checkbox"/>	Lippy Kids		6:06	Elbow	Build a Rocket Bovs!	Alternative	35	2013-11-08, 3:4...	2011-05
<input checked="" type="checkbox"/>	Storm Before the Calm								
<input checked="" type="checkbox"/>	Harder Better Faster Stronger								
<input checked="" type="checkbox"/>	In Our Nature								
<input checked="" type="checkbox"/>	Get Lucky (feat. Pharrell Willi...								
<input checked="" type="checkbox"/>	Offspring Are Blank		4:00	Dirty Projectors	Swing Lo Magellan	Alternative	35	2014-08-01, 9:2...	2012-12

# Sorting by column

# Sorting by column

```
table.sort( 4 );  
table.sort( "Eyes" );
```

```
table.sortReverse( 4 );  
table.sortReverse( "Eyes" );
```

Make sure to tell the table that the column contains numbers!

```
table.setColumnType( "SomeColumn", Table.INT );  
table.setColumnType( "Other", Table.FLOAT );
```

# Baseball salaries

## Salaries.csv

```
yearID,teamID,lgID,playerID,salary
```

```
1985,ATL,NL,barkele01,870000
```

```
1985,ATL,NL,bedrost01,550000
```

```
1985,ATL,NL,benedbr01,545000
```

```
1985,ATL,NL,campri01,633333
```

```
1985,ATL,NL,ceronri01,625000
```

```
1985,ATL,NL,chambch01,800000
```

```
1985,ATL,NL,dedmoje01,150000
```

```
1985,ATL,NL,forstte01,483333
```

```
...
```



# Baseball salaries

## Salaries.csv

```
yearID,teamID,lgID,playerID,salary
1985,ATL,NL,barkele01,870000
1985,ATL,NL,bedrost01,550000
1985,ATL,NL,benedbr01,545000
1985,ATL,NL,campri01,633333
1985,ATL,NL,ceronri01,625000
1985,ATL,NL,chambch01,800000
1985,ATL,NL,dedmoje01,150000
1985,ATL,NL,forstte01,483333
```

...

## Master.csv

```
playerID,birthYear,birthMonth,birthDay,birthCountry,birthState,birthCity,deathYear
aardsda01,1981,12,27,USA,CO,Denver,,,,,David,Aardsma,David Allan,215,75,R,R,2004-
benedbr01,1955,8,18,USA,AL,Birmingham,,,,,Bruce,Benedict,Bruce Edwin,175,73,R,R,
```

...

# Regional food inspections

## Facilities\_OpenData.csv

```
"FACILITYID", "BUSINESS_NAME", "TELEPHONE", "ADDR", "CITY", "EATSMART", "OPEN_DATE", "DESCR  
"B5AB474B-2CBC-4D61-B100-670BB6EE6AD7", "YE'S SUSHI", "519-888-6066", "B8 - 583 KING S  
"CCA5C401-01EF-42AE-832C-7AB24C201263", "KISMET RESTAURANT", "(519) 746-8788", "20 - 1  
...
```

## Inspections\_OpenData.csv

```
"INSPECTION_ID", "FACILITYID", "INSPECTION_DATE", "REQUIRE_REINSPECTION", "CERTIFIED_FO  
"{56D1AB86-5392-452E-8336-000964689795}", "081F0F8A-892E-41F7-811C-9CEE8D690A14", "20  
"{67DF7158-C081-412B-B6DC-000C251E98F6}", "23AA5EBA-35C8-47FB-8C95-198C50C72B92", "20  
"{C449B882-89A0-4F47-B05A-000C326432A1}", "F1CFD836-8A73-4A03-85E0-1EE669470E26", "20  
...
```

## Infractions\_OpenData.csv

```
"INFRACTION_ID", "INSPECTION_ID", "INFRACTION_TYPE", "Infraction", "Result", "Comment", "  
"{187D230D-954E-426E-AD29-2622155F4C16}", "{C45B2081-E864-43CB-A569-0021567F3327}", "  
"{5D5A9FDC-019D-4275-A6E0-6C4E97DD136A}", "{C45B2081-E864-43CB-A569-0021567F3327}", "  
...
```

# Regional food inspections

1. Get restaurant name from user.
2. Look up corresponding FACILITYID in Facilities\_OpenData.csv.
3. In Inspections\_OpenData.csv, find all INSPECTION\_IDS that have the same FACILITYID.
4. In Infractions\_OpenData.csv, find all INFRACTION\_IDS associated with any of these INSPECTION\_IDS.
5. Report the text of the infractions.