

# Dashboards

# What is a dashboard?

## Build a dashboard

A *dashboard* gives you an at-a-glance view of your data and lets you track metrics through different visualizations.

Dashboards consist of *panels*, each representing a part of the story you want your dashboard to tell.

Every panel consists of a *query* and a *visualization*. The query defines *what* data you want to display, whereas the visualization defines *how* the data is displayed.

<https://grafana.com/tutorials/grafana-fundamentals>

# Ingredients for a dashboard

- data
  - at a glance visualizations
  - **tracking!!!!!!**
    - **Reading between the lines: incoming data and historical data**
    - **Reading between the lines: databases for storage and retrieval!**
    - **Reading between the lines: data transfer protocols**
  - multi-part (panels) that tell a story
    - Reading between the lines: pre-existing questions / concerns / goals

# Questions

Have you used a dashboard?

Have you made a dashboard?

<https://forms.gle/dVFxpqWJ71ijVL7q8>

Used?

Round trip 1 Economy

Erie

Paris

Fri, Mar 1

Fri, Mar 8

All filters

Stops

Airlines

Bags

Price

Times

Emissions

Connecting airports

Track prices Mar 1 - 8

Date grid Price graph

Round trip 1 Economy

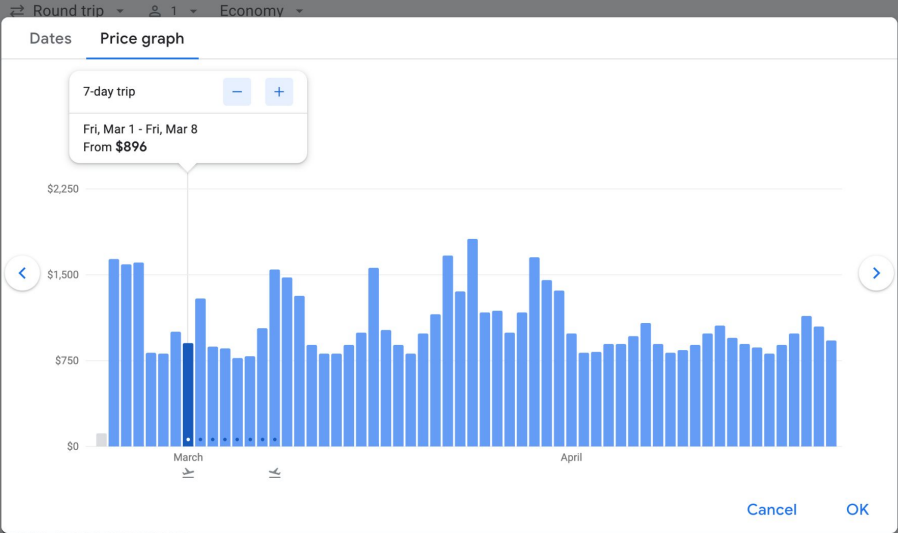
Dates Price graph

Departure

Tue Feb 27	Wed Feb 28	Thu Feb 29	Fri Mar 1	Sat Mar 2	Sun Mar 3	Mon Mar 4	Tue Mar 5
\$818	\$816	\$1,000	\$896	\$1,802	\$2,247	\$2,209	
\$811	\$805	\$1,000	\$896	\$1,777	\$1,752	\$2,199	
\$811	\$805	\$1,000	\$896	\$1,796	\$1,727	\$2,199	
\$819	\$824	\$1,000	\$896	\$1,670	\$1,727	\$1,727	
\$869	\$888	\$1,050	\$946	\$1,286	\$1,547	\$1,787	
\$869	\$867	\$1,076	\$972	\$1,283	\$869	\$867	
\$861	\$855	\$1,050	\$946	\$1,271	\$861	\$855	

Mar 1 - 8 \$896 · Round trip

Cancel



1 United States Dollar equals



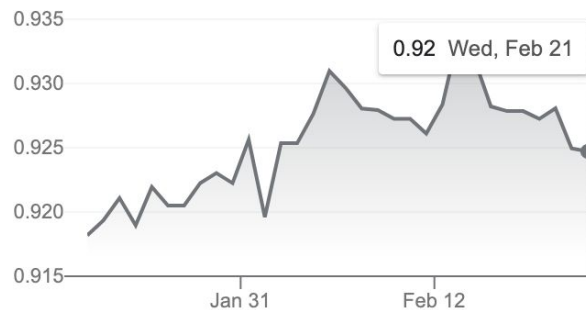
# 0.92 Euro

Feb 21, 4:50AM UTC · Disclaimer

1 United States Dollar ▼

0.92 Euro ▼

1D 5D 1M 1Y 5Y Max



[More about USD/EUR →](#)

[Feedback](#)

# American AA 5701

Charlotte to Erie

Mon, Feb 19

Tue, Feb 20

Wed, Feb 21

Thu, Feb 22

9:00 PM

to Erie ERI

AA 5701

ARRIVED

CLT

1h 57m



ERI

Charlotte · Tue, Feb 20

Departed

9:00 PM

Terminal

-

Gate

E10

Erie · Tue, Feb 20

Arrived

10:57 PM

Terminal

-

Gate

-

10:49 PM

Updated 54m ago

Sources: [OAG](#), [FlightAware](#)



Showing local airport times

[Feedback](#)



S&P Futures

4,985.25

-6.25 (-0.13%)



Dow Futures

38,603.00

-39.00 (-0.10%)



Nasdaq Futures

17,560.25

-47.00 (-0.27%)



Russell 2000 Futures

2,009.70

-0.50 (-0.02%)



Crude Oil

78.27

+0.09 (+0.12%)



Nasdaq 100 Mar 24 (NQ=F)

CME - CME Delayed Price. Currency in USD



**17,560.00** -47.25 (-0.27%)

As of 11:44PM EST. Market open.

Summary

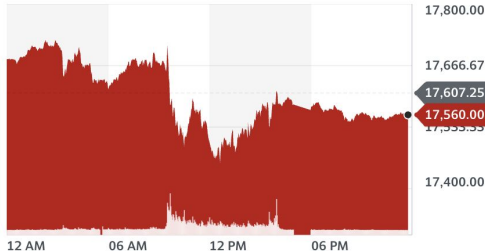
Chart

Historical Data

Futures

Pre. Settlement	N/A	Last Price	17,607.25
Settlement Date	2024-03-15	Day's Range	17,538.50 - 17,590.00
Open	17,729.25	Volume	21,335
Bid	17,550.75	Ask	17,551.00

1D 5D 1M 6M YTD 1Y 5Y Max  Full screen





UNITED STATES

# WEEKLY TOP ARTISTS

Feb 9 - Feb 15, 2024

Ranking of this week's most popular artists.

Feb 9 - Feb 15, 2024

Most popular

Rank

Last week

Weeks on chart

Weekly views

1

▲2



Taylor Swift

3

386

35,470,724











YESTERDAY



1  
Floor



4.54  
Miles

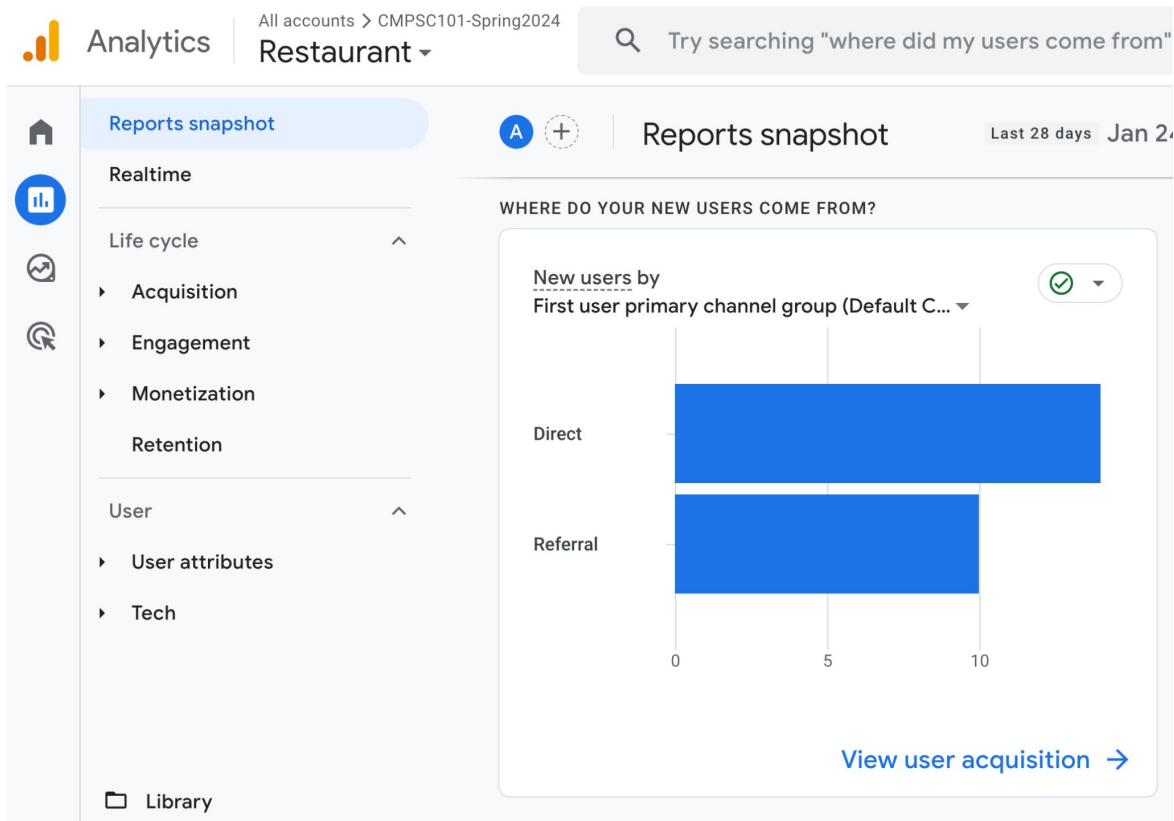


2,531  
Cals



75  
Mins

# Made?





# Engagement overview

Last 28 days

Jan 24 - Feb 20, 2024



## Event count by Event name



EVENT NAME

EVENT COUNT

page_view	118
user_engagement	92
scroll	54
session_start	35
first_visit	24
click	2
.	

[View events →](#)

## Views by Page title and screen class



PAGE TITLE AND SCREEN ...

VIEWS

about   Data Exploration Blog	63
Take it or Leave it Bakery   D...	27
contact   Data Exploration Bl...	8
explorations   Data Explorati...	8
amazing menu   Data Explor...	7
about   iScream	3
Analytics   Data Exploration ...	2
-	

[View pages and screens →](#)



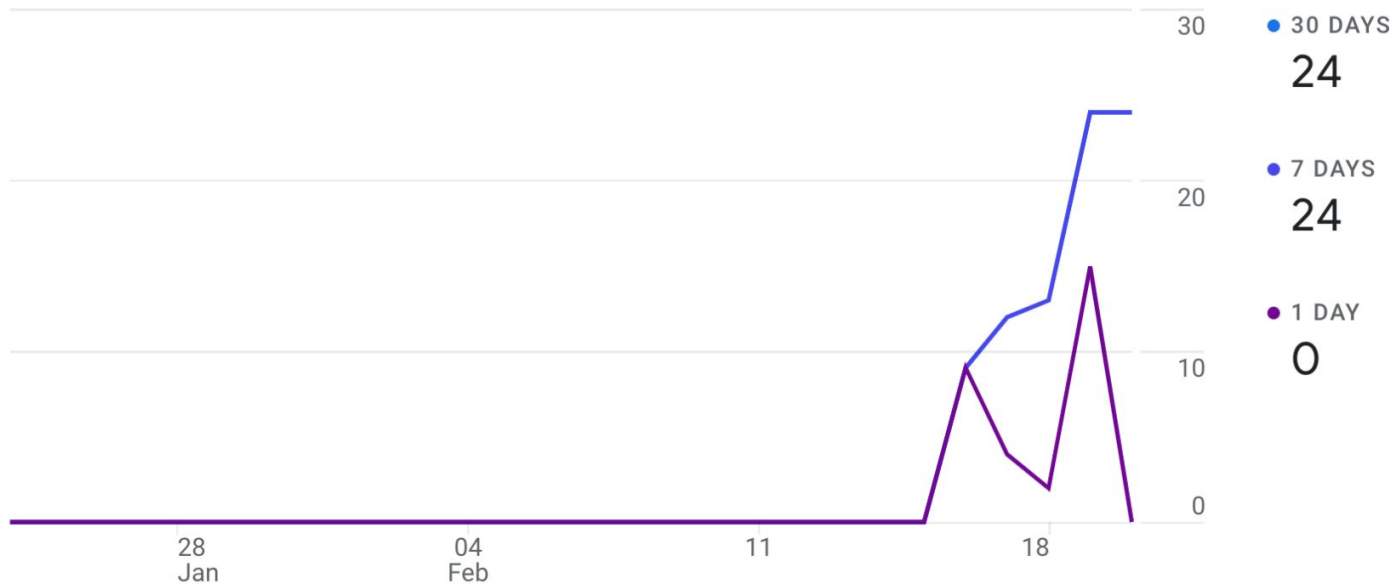
# Engagement overview

Last 28 days

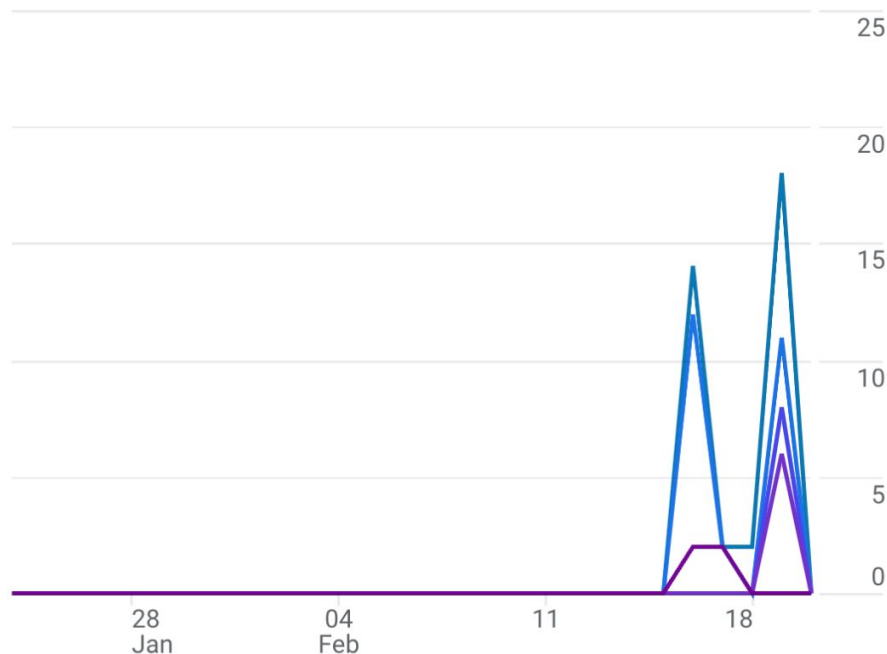
Jan 24 - Feb 20, 2024



## User activity over time

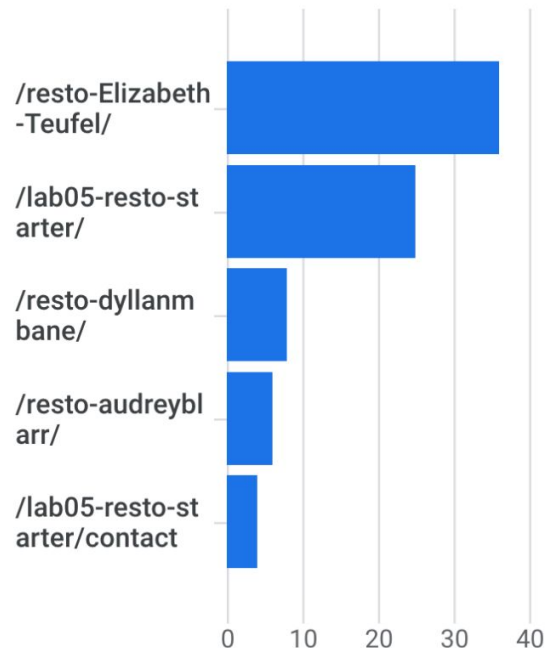


Views by Page path and screen class over time



● /resto-Elizabeth-Teufel/ ● /lab05-resto-starter/ ● /resto-dyllanmbane/ < >

Views by Page path and screen class





# Dashboard != Data source

Dashboards (process) and display data from a separate source

Both entities need to know about the other to do secure data transfers

- recall, you had to give google analytics a url
- recall, you had to give your website a tracking ID

```
! _config.yml
1  # TODO: replace the title with the name of your restaurant!
2  title: "Data Exploration Blog"
3  # TODO: write your restaurateur alter ego name below, or your own name
4  author:
5  # TODO: write your Google Analytics tracking ID below
6  google_analytics: G-FDG725B6FJ
7
8  theme: minima
9
10 collections:
11   explorations:
12     output: true
```

# What can the data source be?

- online sources
  - clicks
  - visits
  - number visitors
  - duration of visit
  - location of user
  - etc
- offline
  - physiological signals
  - motion / gesture

# Data storage

How can data be stored?

- small data files: .csv

# Where does google analytics store all of its data?

## Bigtable

🌐 13 languages ▾

Article [Talk](#)

Read [Edit](#) [View history](#) [Tools](#) ▾

From Wikipedia, the free encyclopedia

**Bigtable** is a fully managed [wide-column](#) and [key-value](#) [NoSQL](#) database service for large analytical and operational workloads as part of the [Google Cloud](#) portfolio.

## History [\[ edit \]](#)

Bigtable development began in 2004.<sup>[1]</sup> It is now used by a number of Google applications, such as [Google Analytics](#),<sup>[2]</sup> web indexing,<sup>[3]</sup> [MapReduce](#), which is often used for generating and modifying data stored in Bigtable,<sup>[4]</sup> [Google Maps](#),<sup>[5]</sup> [Google Books](#) search, "My Search History", [Google Earth](#), [Blogger.com](#), [Google Code](#) hosting, [YouTube](#),<sup>[6]</sup> and [Gmail](#).<sup>[7]</sup> Google's reasons for developing its own database include scalability and better control of performance characteristics.<sup>[8]</sup>

Google's [Spanner RDBMS](#) is layered on an implementation of Bigtable with a [Paxos](#) group for [two-phase commits](#) to each table. [Google F1](#) was built using Spanner to replace an implementation based on [MySQL](#).<sup>[9]</sup>

[Apache HBase](#) and [Cassandra](#) are some of the best known open source projects that were modeled after Bigtable.

On May 6, 2015, a public version of Bigtable was made available as a part of [Google Cloud](#) under the name Cloud Bigtable.<sup>[2]</sup>

### Google Bigtable

<b>Developer(s)</b>	<a href="#">Google</a>
<b>Initial release</b>	February 2005; 19 years ago
<b>Written in</b>	<a href="#">C++</a> (core), <a href="#">Java</a> , <a href="#">Python</a> , <a href="#">Go</a> , <a href="#">Ruby</a>
<b>Platform</b>	<a href="#">Google Cloud Platform</a>
<b>Type</b>	Cloud Storage
<b>License</b>	<a href="#">Proprietary</a>
<b>Website</b>	<a href="#">cloud.google.com/bigtable/</a> <a href="#">↗</a>

# What is a database?

<https://en.wikipedia.org/wiki/Database>

## Allegheny College CMPSC 305

### CMPSC 305 - Database Systems

#### CMPSC 305 - Database Systems

*Credits:* 4

A study of the application and evaluation of database management systems. Participating in hands-on activities that often require teamwork, students design, implement, and deploy database systems that store interdisciplinary data sets. In addition to learning how to develop and assess interfaces for databases, students study the efficiency and effectiveness of alternative data management systems. During a weekly laboratory session students use industry-grade technology to complete projects, reporting on their results through both written documents and oral presentations. Students are invited to use their own departmentally approved laptop in this course; a limited number of laptops are available for use during class and lab sessions.

*Prerequisite:* CMPSC 101.

*Distribution Requirements:* QR, SP.

```
dvdrntal=# select title, release_year, length, replacement_cost from film
dvdrntal=#   where length > 120 and replacement_cost > 29.50
dvdrntal=#   order by title desc;
```

title	release_year	length	replacement_cost
West Lion	2006	159	29.99
Virgin Daisy	2006	179	29.99
Uncut Suicides	2006	172	29.99
Tracy Cider	2006	142	29.99
Song Hedwig	2006	165	29.99
Slacker Liaisons	2006	179	29.99
Sassy Packer	2006	154	29.99
Driver Outlaw	2006	149	29.99
ini	2006	153	29.99
ever	2006	177	29.99
ally	2006	159	29.99
on	2006	140	29.99
rush	2006	181	29.99
n	2006	124	29.99
n	2006	171	29.99
ed	2006	135	29.99
n	2006	163	29.99
n	2006	145	29.99
k	2006	131	29.99
y Conquerer	2006	122	29.99
ft	2006	163	29.99
	2006	147	29.99
	2006	139	29.99
radise	2006	143	29.99
kingbird	2006	173	29.99

From Wikipedia, the free encyclopedia

*This article is about the computing concept. For instances of the general concept, see [Lists of databases](#).*

In [computing](#), a **database** is an organized collection of [data](#) or a type of [data store](#) based on the use of a **database management system (DBMS)**, the [software](#) that interacts with [end users](#), [applications](#), and the database itself to capture and analyze the data. The DBMS additionally encompasses the core facilities provided to administer the database. The sum total of the database, the DBMS and the associated applications can be referred to as a **database system**. Often the term "database" is also used loosely to refer to any of the DBMS, the database system or an application associated with the database.

Small databases can be stored on a [file system](#), while large databases are hosted on [computer clusters](#) or [cloud storage](#). The [design of databases](#) spans formal techniques and practical considerations, including [data modeling](#), efficient data representation and storage, [query languages](#), [security](#) and [privacy](#) of sensitive data, and [distributed computing](#) issues, including supporting [concurrent](#) access and [fault tolerance](#).

[Computer scientists](#) may classify database management systems according to the [database models](#) that they support. [Relational databases](#) became dominant in the 1980s. These model data as [rows](#) and [columns](#) in a series of [tables](#), and the vast majority use [SQL](#) for writing and querying data. In the 2000s, non-relational databases became popular, collectively referred to as [NoSQL](#), because they use different [query languages](#).

```
dvdrental=# select title, release_year, length, replacement_cost from film
dvdrental=#   where length > 120 and replacement_cost > 29.50
dvdrental=#   order by title desc;
```

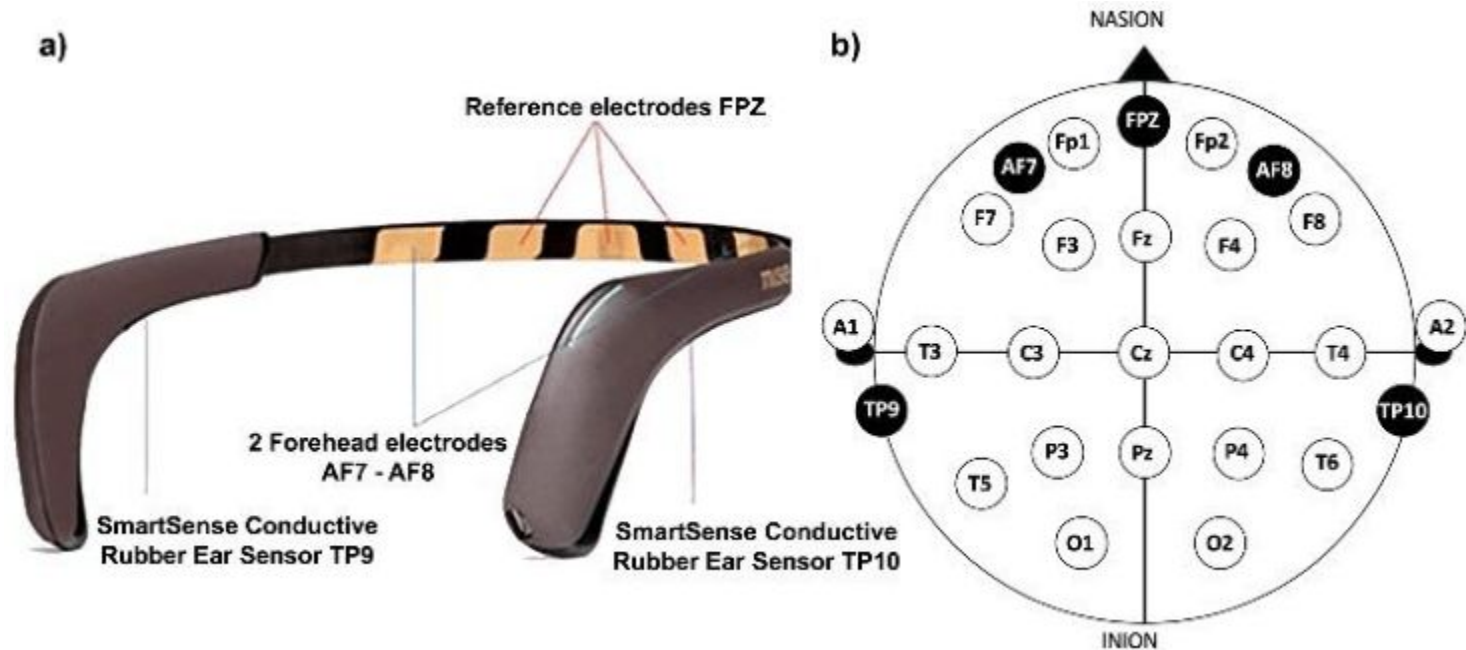
title	release_year	length	replacement_cost
West Lion	2006	159	29.99
Virgin Daisy	2006	179	29.99
Uncut Suicides	2006	172	29.99
Tracy Cider	2006	142	29.99
Song Hedwig	2006	165	29.99
Slacker Liaisons	2006	179	29.99
Sassy Packer	2006	154	29.99
River Outlaw	2006	149	29.99
Right Cranes	2006	153	29.99
Quest Mussolini	2006	177	29.99
Poseidon Forever	2006	159	29.99
Loathing Legally	2006	140	29.99
Lawless Vision	2006	181	29.99
Jingle Sagebrush	2006	124	29.99
Jericho Mulan	2006	171	29.99
Japanese Run	2006	135	29.99
Gilmore Boiled	2006	163	29.99
Floats Garden	2006	145	29.99
Fantasia Park	2006	131	29.99
Extraordinary Conquerer	2006	122	29.99
Everyone Craft	2006	163	29.99
Dirty Ace	2006	147	29.99
Clyde Theory	2006	139	29.99
Clockwork Paradise	2006	143	29.99
Ballroom Mockingbird	2006	173	29.99

(25 rows)

An [SQL](#) select statement and its result

# Back to offline data and data storage

Demo!



# Friday

## Class

- demo on grafana dashboard

## Lab

- Lab5 == resto + analytics
- Have `index.md`, `menu.md`, and `contact.md` done by 2:30 on Friday
- website reviews according to assignment on Discord until 3pm
- 3-4:20 is for retrieving reviews, and examining google analytics for short post in analytics.md.
- Lab 5 is due at 11:59 pm on Friday Feb. 23.