

# Automatic Sampling and Analysis of YouTube Data

## Setting Up Access to the YouTube API

Julian Kohne  
Johannes Breuer  
M. Rohangis Mohseni

2021-02-24

# Setting up API access to the *YouTube* API

To effectively work with *YouTube* data, we need access to its Application Programming Interface (API). As this process, unfortunately, can be a bit tedious, we prepared this preliminary tutorial so you don't have to spend time setting up your API access during the workshop. Please follow this tutorial and check if the setup works before the workshop. If your setup does not work, feel free to contact us before the workshop (the sooner the better) and we'll try to assist you in setting up access to the *YouTube* API. If, for some reason, setting up access to the API does not work for you and we don't find a solution or if you cannot access the API during the workshop, we will have some data prepared that you can then work with in the workshop.

Contact: [julian.kohne@gesis.org](mailto:julian.kohne@gesis.org)

**HINT:** Pink texts in the slides are hyperlinks that you can simply click on

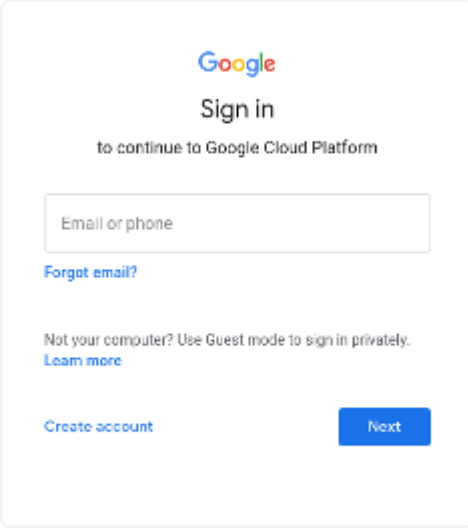
# Setting up API Access

- For starters, you need a *Gmail* account
- We suggest that you create a new account specifically for this workshop, so you don't mess up or accidentally share the credentials of your private or work account
- You can create a new account [here](#)
- Next, you need to:
  - Sign up for the *Google Developer Console*
  - Create a new project
  - Activate the *YouTube Data API*
  - Create authentication credentials
  - Test the credentials from R

We will explain these steps in detail on the following slides.

# Google Developer Console

- Go to the **Developer Console** and log in with your (new) *Google* Account



Google

Sign in

to continue to Google Cloud Platform

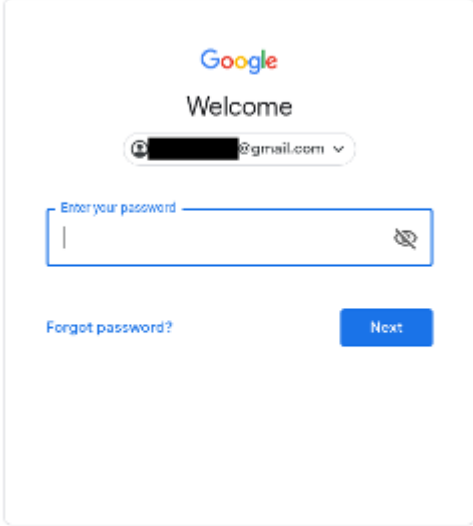
Email or phone

[Forgot email?](#)

Not your computer? Use Guest mode to sign in privately.  
[Learn more](#)

[Create account](#) [Next](#)

English (United States) ▾ [Help](#) [Privacy](#) [Terms](#)



Google

Welcome

📧 [redacted]@gmail.com ▾

Enter your password

[Forgot password?](#) [Next](#)

English (United States) ▾ [Help](#) [Privacy](#) [Terms](#)

# Accepting the Terms of Service

- You need to accept the Google Developer ToS, can deselect the email updates, and click "Agree and continue"

The screenshot shows the Google Cloud Platform activation interface. A modal dialog is centered on the screen, titled "Google Cloud Platform". Inside the dialog, the "Welcome" section is followed by a "Country" dropdown menu set to "Germany". Below this is the "Terms of Service" section, which contains a checked checkbox for "I agree to the Google Cloud Platform Terms of Service, and the terms of service of any applicable services and APIs." and a link to the terms of service. The "Email updates" section has an unchecked checkbox for "I would like to receive periodic emails on news, product updates and special offers from Google Cloud and Google Cloud Partners." At the bottom right of the dialog is a button labeled "AGREE AND CONTINUE". Three red arrows point to the "Terms of Service" checkbox, the "Email updates" checkbox, and the "AGREE AND CONTINUE" button respectively. The background shows the Google Cloud Platform dashboard with a sidebar menu and a top navigation bar.

Google Cloud Platform

Welcome [redacted]!

Create and manage your Google Cloud Platform instances, disks, networks, and other resources in one place.

Country

Germany

Terms of Service

☒ I agree to the [Google Cloud Platform Terms of Service](#), and the terms of service of [any applicable services and APIs](#).

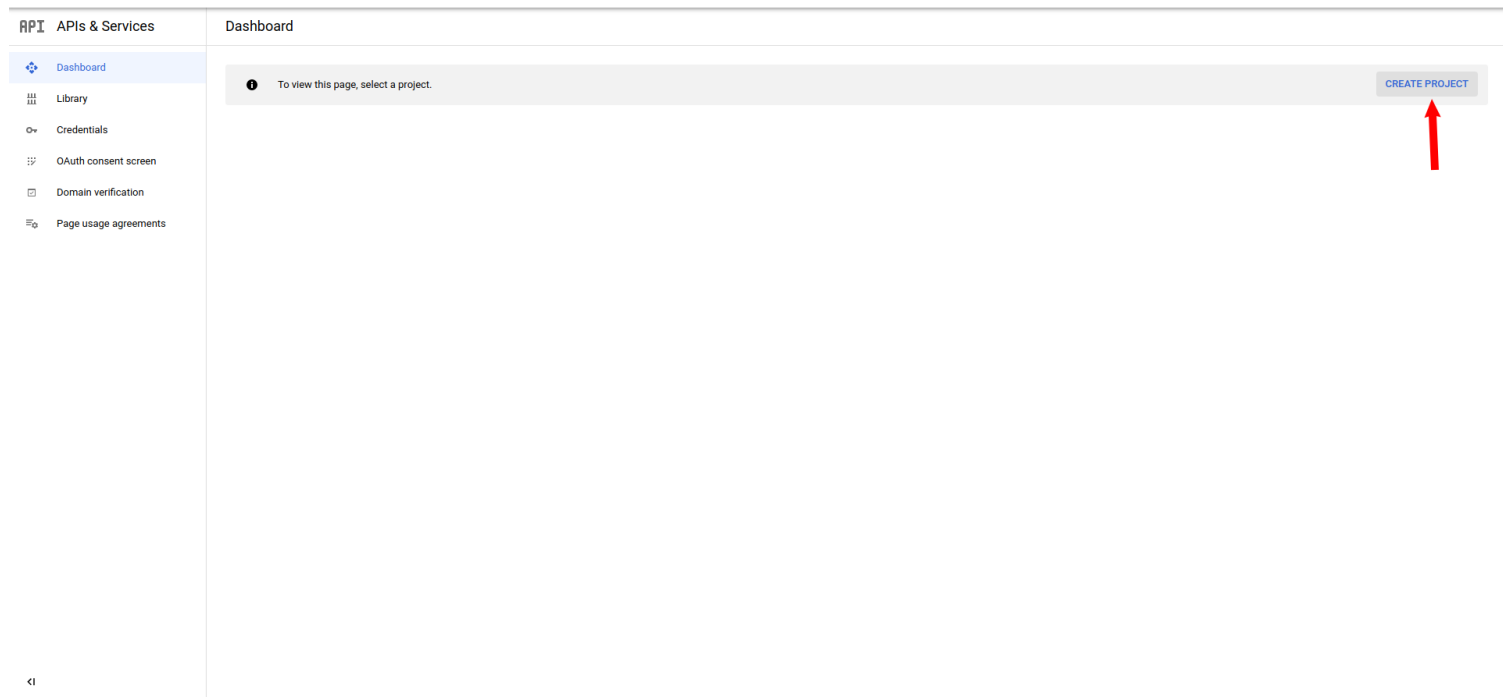
Email updates

☐ I would like to receive periodic emails on news, product updates and special offers from Google Cloud and Google Cloud Partners.

AGREE AND CONTINUE

# Creating a Project

- On the top right of the screen, click on "create project" to start a new project




# Creating a Project


- Enter a project name and click on "create"; you don't need to specify an organization

---


New Project

---

 You have 11 projects remaining in your quota. Request an increase or delete projects. [Learn more](#)  
[MANAGE QUOTAS](#)

Project name \*  
YouTubeScraper 

Project ID: youtubescraper-302516. It cannot be changed later. [EDIT](#)

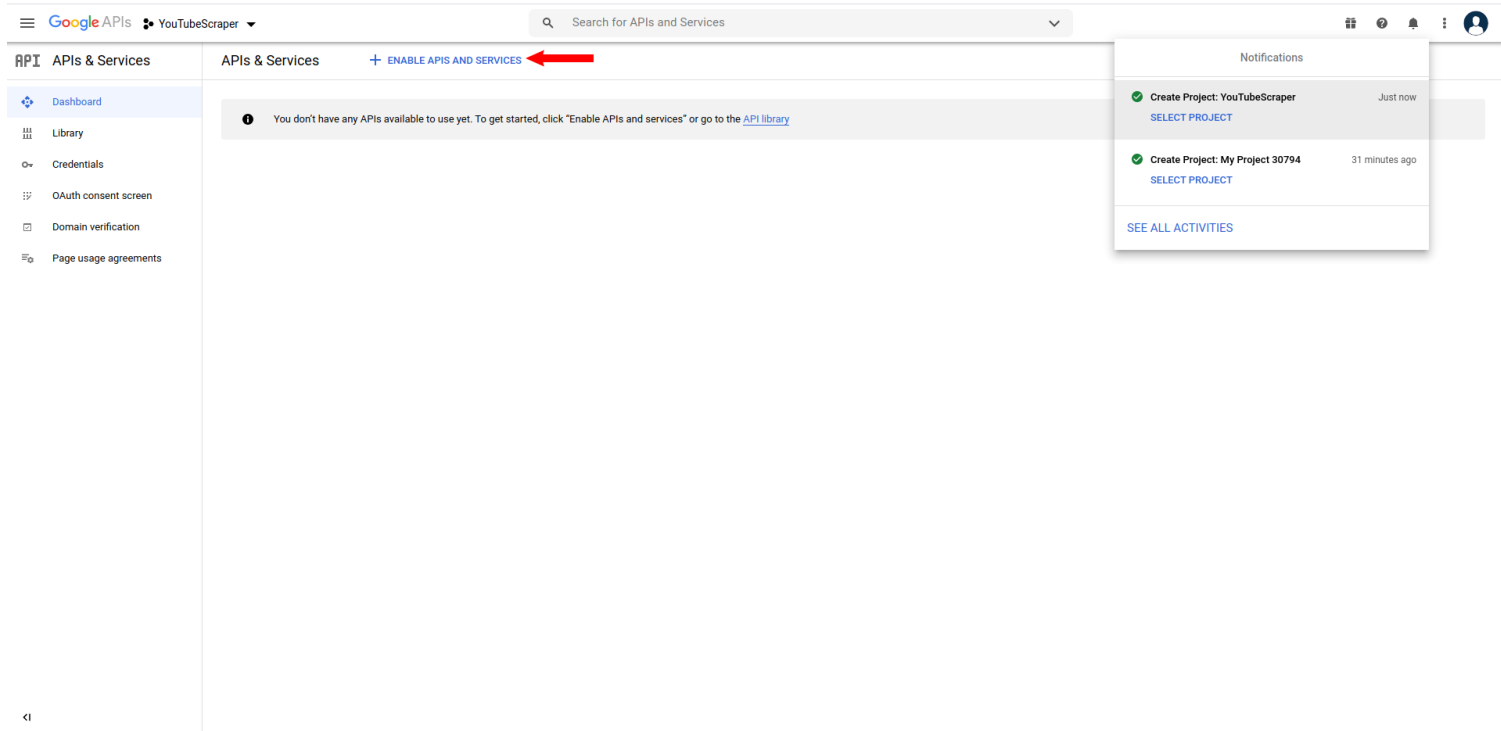
Location \*  
 No organization [BROWSE](#)  
Parent organization or folder

[CREATE](#) [CANCEL](#)

---

# Enabling YouTube Data API v3

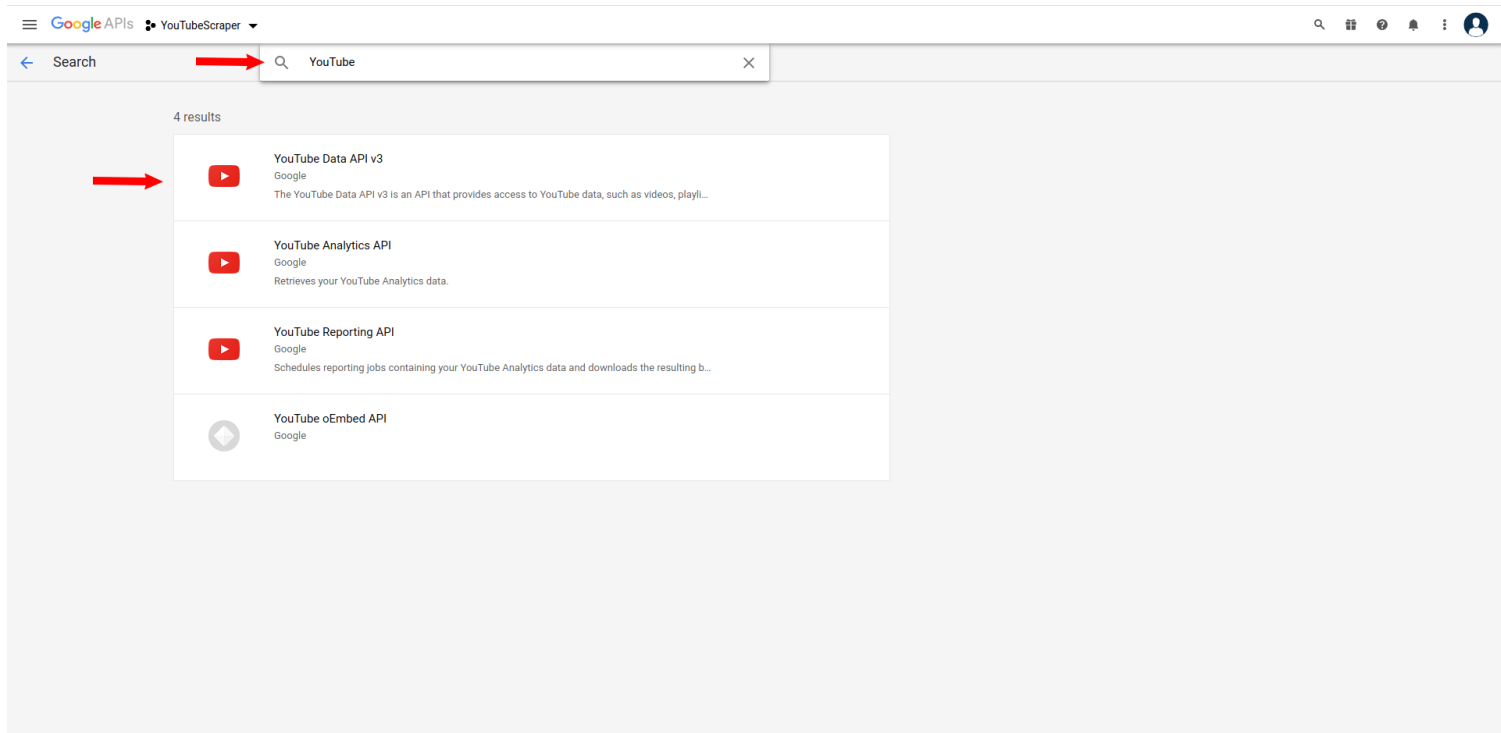
- On the next screen, click on "Enable APIs and Services" in the top left





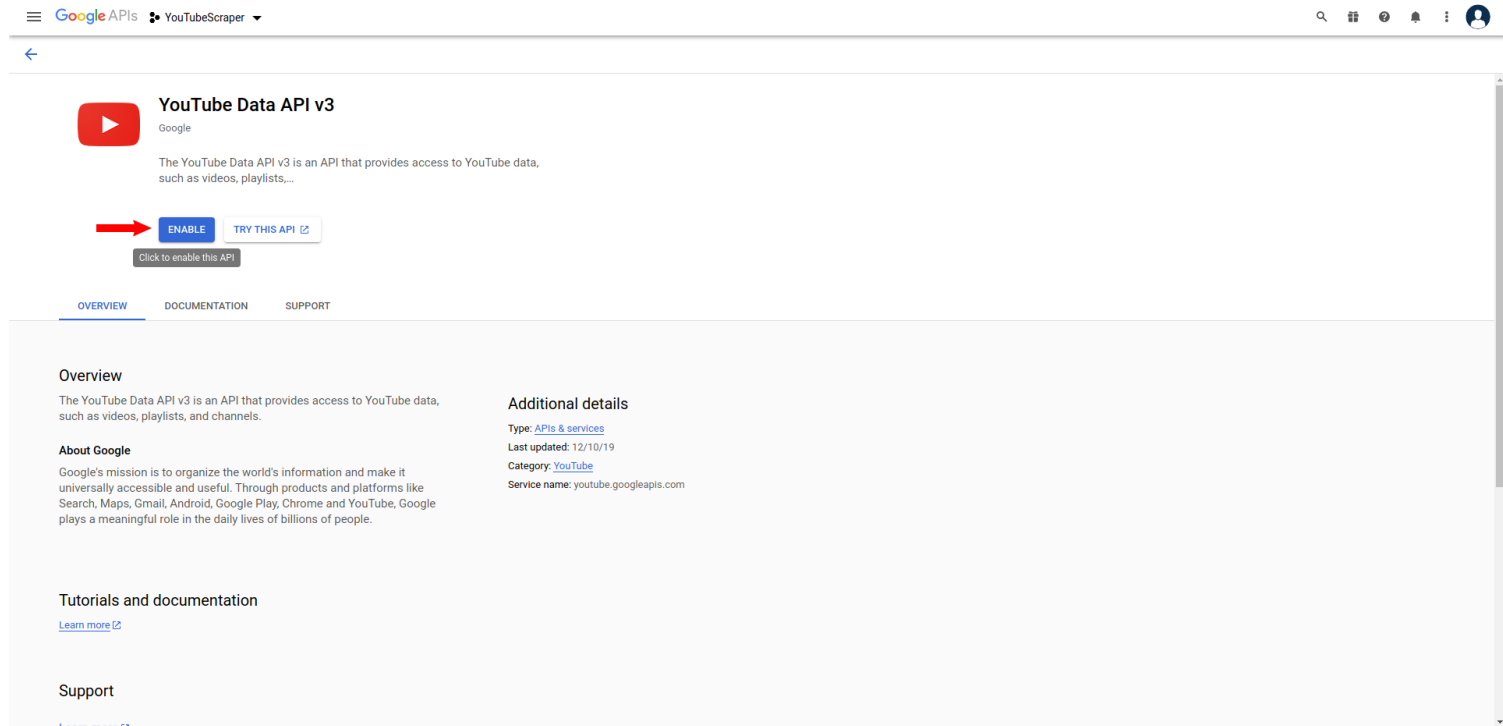
# Enabling YouTube Data API v3

- Enter "YouTube" in the search bar and select "YouTube Data API v3" by clicking on it



# Enabling YouTube Data API v3

- Next, click on the blue "Enable" button on the left side



The screenshot shows the Google APIs console interface for the YouTube Data API v3. At the top, the navigation bar includes the Google APIs logo and a dropdown menu for 'YouTubeScraper'. The main content area features a red YouTube play button icon, the title 'YouTube Data API v3', and the text 'The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists,...'. Below this, there is a blue 'ENABLE' button and a 'TRY THIS API' link. A red arrow points to the 'ENABLE' button, and a tooltip below it says 'Click to enable this API'. The page has tabs for 'OVERVIEW', 'DOCUMENTATION', and 'SUPPORT'. The 'OVERVIEW' tab is active, showing an overview of the API, its details (Type: APIs & services, Last updated: 12/10/19, Category: YouTube, Service name: youtube.googleapis.com), and links to tutorials and documentation.

Google APIs YouTubeScraper

YouTube Data API v3

Google

The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists,...

**ENABLE** TRY THIS API

Click to enable this API

OVERVIEW DOCUMENTATION SUPPORT

**Overview**

The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists, and channels.

**About Google**

Google's mission is to organize the world's information and make it universally accessible and useful. Through products and platforms like Search, Maps, Gmail, Android, Google Play, Chrome and YouTube, Google plays a meaningful role in the daily lives of billions of people.

**Additional details**

Type: [APIs & services](#)

Last updated: 12/10/19

Category: [YouTube](#)

Service name: youtube.googleapis.com

**Tutorials and documentation**

[Learn more](#)

**Support**

[Learn more](#)

# Setting up Credentials

- Click on the "Create credentials" button on the top right of your screen

The screenshot shows the Google APIs & Services console for the YouTube Data API v3. The interface includes a top navigation bar with the Google APIs logo, the project name 'YouTubeScraper', and a search bar. The left sidebar contains navigation links for 'Overview', 'Metrics', 'Quotas', and 'Credentials'. The main content area is titled 'Overview' and features a 'DISABLE API' button. A message states: 'To use this API, you may need credentials. Click 'Create credentials' to get started.' A red arrow points to the 'CREATE CREDENTIALS' button in the top right corner. Below the message, there are two panels: 'Details' on the left and 'Traffic by response code' on the right. The 'Details' panel includes fields for Name (YouTube Data API v3), By (Google), Service name (youtube.googleapis.com), Overview (The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists, and channels.), and Activation status (Enabled). The 'Traffic by response code' panel shows a line graph for 'Request/sec (2 hr average)' with a message: 'No data is available for the selected time frame.' At the bottom left, the URL 'https://console.developers.google.com/apis/credentials/wizard?project=youtubescraper-302516' is visible.

Google APIs YouTubeScraper Search for APIs and Services

APIs & Services YouTube Data API v3 Overview [DISABLE API](#)

**Overview**

To use this API, you may need credentials. Click 'Create credentials' to get started. [CREATE CREDENTIALS](#)

**Details**

Name  
YouTube Data API v3

By  
Google

Service name  
youtube.googleapis.com

**Overview**  
The YouTube Data API v3 is an API that provides access to YouTube data, such as videos, playlists, and channels.

**Activation status**  
Enabled

**Tutorials and documentation**

[Learn more](#)

[Try in API Explorer](#)

[Maintenance & support](#)

**Traffic by response code**

Request/sec (2 hr average)

No data is available for the selected time frame.

[View metrics](#)

41  
<https://console.developers.google.com/apis/credentials/wizard?project=youtubescraper-302516>

# Setting up Credentials

- Select "YouTube Data API v3", "Other UI" and "User data" in the respective field and click on "What credentials do I need?" on the bottom of the screen

Google APIs YouTubeScraper Search for APIs and Services

APIs & Services Credentials

### Add credentials to your project

1 Find out what kind of credentials you need

We'll help you set up the correct credentials. If you wish you can skip this step and create an [API key](#), [client ID](#), or [service account](#).

**Which API are you using?**  
Different APIs use different auth platforms and some credentials can be restricted to only call certain APIs.

YouTube Data API v3

**Where will you be calling the API from?**  
Credentials can be restricted using details of the context from which they're called. Some credentials are unsafe to use in certain contexts.

Other UI (e.g. Windows, CLI tool)

**What data will you be accessing?**  
Different credentials are required to authorize access depending on the type of data that you request.

☐ Public data  
Access publicly available data provided by the API

☒ User data  
Access data belonging to a Google user, with their permission

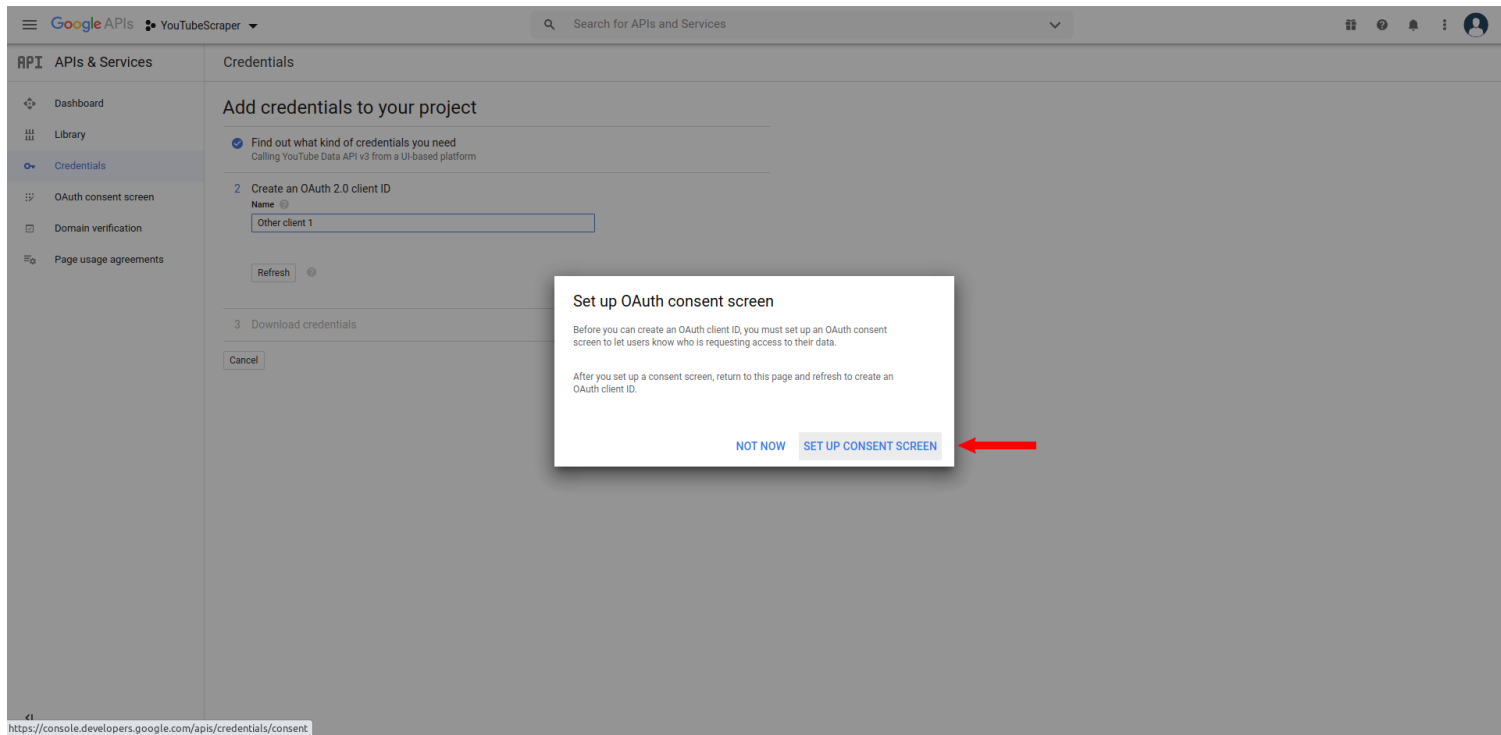
[What credentials do I need?](#)

2 Get your credentials

Cancel

# Configuring Consent Screen

- A popup will prompt you to set up as consent screen before proceeding, click on "Set up consent screen"



# Configuring Consent Screen

- Select "External" and click on "create"

The screenshot shows the Google APIs & Services console interface. On the left, the 'APIs & Services' menu is open, with 'OAuth consent screen' selected. The main content area displays the 'OAuth consent screen' configuration page. Under the 'User Type' section, the 'External' radio button is selected, indicated by a red arrow. Below this, the 'CREATE' button is highlighted with a red arrow. The right sidebar contains a 'Learn' section with various links related to OAuth consent screens.

Google APIs & Services • YouTubeScraper

Search for APIs and Services

APIs & Services

OAuth consent screen

Learn

Dashboard

Library

Credentials

OAuth consent screen

Domain verification

Page usage agreements

Choose how you want to configure and register your app, including your target users. You can only associate one app with your project.

User Type

☐ Internal

☒ External

Only available to users within your organization. You will not need to submit your app for verification.

Available to any test user with a Google Account. Your app will start in testing mode and will only be available to users you add to the list of test users. Once your app is ready to push to production, you may need to [verify your app](#).

CREATE

[Let us know what you think](#) about our OAuth experience

Google OAuth consent screen

What is the OAuth consent screen?

What are OAuth consent scopes?

What are sensitive API scopes?

What are restricted API scopes?

The app registration process

What information do I need?

Will my app need to be verified by Google?

What if I don't verify my app?

How long does the verification process take?

How many users can use my app?

Domain verification

What else should I review?

# Configure Scopes

- On the next screen, enter an arbitrary app name and enter your Gmail address twice as "User support Email" and "Developer Contact Information". You can leave the other fields blank.

**Google APIs & Services** YouTubeScaper

Search for APIs and Services

**APIs & Services**

- Dashboard
- Library
- Credentials
- OAuth consent screen**
- Domain verification
- Page usage agreements

**Edit app registration**

**App information**

This shows in the consent screen, and helps end users know who you are and contact you

App name \*  
YouTubeScaper

The name of the app asking for consent

User support email \*  
[redacted]@gmail.com

For users to contact you with questions about their consent

App logo [BROWSE](#)

Upload an image, not larger than 1MB on the consent screen that will help users recognize your app. Allowed image formats are JPG, PNG, and BMP. Logos should be square and 120px by 120px for the best results.

**App domain**

To protect you and your users, Google only allows apps using OAuth to use Authorized Domains. The following information will be shown to your users on the consent screen.

Application home page  
Provide users a link to your home page

Application privacy policy link  
Provide users a link to your public privacy policy

Application terms of service link  
Provide users a link to your public terms of service

**Authorized domains**

When a domain is used on the consent screen or in an OAuth client's configuration, it must be pre-registered here. If your app needs to go through verification, please go to the [Google Search Console](#) to check if your domains are authorized. [Learn more](#) about the authorized domain limit.

[+ ADD DOMAIN](#)

**Developer contact information**

Email addresses \*  
[redacted]@gmail.com

These email addresses are for Google to notify you about any changes to your project.

[SAVE AND CONTINUE](#) [CANCEL](#)

**Learn**

**How is this info presented to users?**

This is the consent screen that users see

Sign in with Google

App Name wants to access your Google Account

This will allow App Name to:

Make sure you trust App Name

You must be sharing sensitive info with this site or app. Learn why. App Name will handle your data by reviewing terms of service and privacy policies. You can always view or revoke access to your Google Account.

[Learn about the risks](#)

[Cancel](#) [Allow](#)

1. Your app logo (if applicable)
2. Your app name, which will be a dynamic link to give users your app's support email address
3. The data you are requesting, or scopes, which you will add in the next step
4. Links to your app's privacy policy and terms of service

# Configure scopes

- Next, click on "Add or remove scopes" to open a side panel on the right side. In this panel, select all fields for the YouTube Data API v3 and click on "update" on the bottom right. Be sure to check all items on all pages.

The screenshot shows the Google APIs console interface for configuring scopes. The main panel displays the 'Edit app registration' page with the 'Scopes' tab selected. A red arrow points to the 'ADD OR REMOVE SCOPES' button. The side panel, titled 'Update selected scopes', shows a table of selected scopes for the YouTube Data API v3. A red arrow points to the 'UPDATE' button at the bottom right of the side panel.

**Update selected scopes**

Only scopes for enabled APIs are listed below. To add a missing scope to this screen, find and enable the API in the [Google API Library](#) or use the Pasted Scopes text box below. Refresh the page to see any new APIs you enable from the Library.

Filter table

API	Scope	User-facing description
<input checked="" type="checkbox"/> YouTube Data API v3	.../auth/youtube-third-party-link.creator	Link to your YouTube channel, and add, remove, and edit the apps own info on your YouTube channel
<input checked="" type="checkbox"/> YouTube Data API v3	.../auth/youtube.download	Download your public YouTube videos

Rows per page: 10 11 - 12 of 12

Already on the last page

**Manually add scopes**

If the scopes you would like to add do not appear in the table above, you can enter them here. Each scope should be on a new line or separated by commas. Please provide the full scope string (beginning with 'https://'). When you are finished, click 'Add to table'.

ADD TO TABLE

**UPDATE**



# Configure scopes

- Click on "Save and Continue" and the bottom left of the page

The screenshot shows the Google APIs & Services console interface. On the left, the 'APIs & Services' sidebar is visible with the 'Credentials' section expanded and 'OAuth consent screen' selected. The main area is titled 'Edit app registration' and displays a table of restricted scopes for the YouTube Data API v3. A red arrow points to the 'SAVE AND CONTINUE' button at the bottom left of the page.

API	Scope	User-facing description
YouTube Data API v3	.../auth/youtube.force-ssl	See, edit, and permanently delete your YouTube videos, ratings, comments and captions
YouTube Data API v3	.../auth/youtubepartner	View and manage your assets and associated content on YouTube
YouTube Data API v3	.../auth/youtubepartner-channel-audit	View private information of your YouTube channel relevant during the audit process with a YouTube partner
YouTube Data API v3	.../auth/youtube.upload	Manage your YouTube videos
YouTube Data API v3	.../auth/youtube.channel-memberships.creator	See a list of your current active channel members, their current level, and when they became a member
YouTube Data API v3	.../auth/youtube.third-party-link.creator	Link to your YouTube channel, and add, remove, and edit the apps own info on your YouTube channel

**Your restricted scopes**  
Restricted scopes are scopes that request access to highly sensitive user data.

API	Scope	User-facing description
No rows to display		

**SAVE AND CONTINUE** **CANCEL**

# Add yourself as a user

- On the subsequent page, click on "Add users", enter your Gmail address and confirm by clicking "add".

The screenshot shows the Google API Console interface for the 'YouTubeScraper' application. The left sidebar contains navigation links: Dashboard, Library, Credentials, OAuth consent screen (selected), Domain verification, and Page usage agreements. The main content area is titled 'Edit app registration' and shows a progress bar with four steps: OAuth consent screen, Scopes, Test users (active), and Summary. Below the progress bar, the 'Test users' section is displayed, explaining that only test users can access the app while in 'Testing' status. A red arrow points to the '+ ADD USERS' button. Below this button, a progress bar shows '0 users (0 test, 0 other) / 100 user cap'. A warning message states: 'In order to limit abuse, users can be added, but not removed'. The bottom of the section has 'SAVE AND CONTINUE' and 'CANCEL' buttons.

The right sidebar shows the 'Add users' dialog. It contains a warning message: 'While publishing status is set to "Testing", only test users are able to access the app. Allowed user cap prior to app verification is 100, and is counted over the entire lifetime of the app.' Below this, a text input field contains a Gmail address (partially obscured) and a red arrow points to the 'ADD' button.

# Add yourself as a user

- On the bottom left of the next page, click on "Back to dashboard"

The screenshot shows the Google APIs & Services console interface. The left sidebar contains navigation links: Dashboard, Library, Credentials, OAuth consent screen, Domain verification, and Page usage agreements. The main content area is titled 'Edit app registration' and displays a table of APIs and their scopes. A red arrow points to the 'BACK TO DASHBOARD' button at the bottom left.

API	Scope	User-facing description
YouTube Data API v3	.../auth/youtube.readonly	View your YouTube account
YouTube Data API v3	.../auth/youtube	Manage your YouTube account
YouTube Data API v3	.../auth/youtube.force-ssl	See, edit, and permanently delete your YouTube videos, ratings, comments and captions
YouTube Data API v3	.../auth/youtubepartner	View and manage your assets and associated content on YouTube
YouTube Data API v3	.../auth/youtubepartner-channel-audit	View private information of your YouTube channel relevant during the audit process with a YouTube partner
YouTube Data API v3	.../auth/youtube.upload	Manage your YouTube videos
YouTube Data API v3	.../auth/youtube.channel-memberships.creator	See a list of your current active channel members, their current level, and when they became a member
YouTube Data API v3	.../auth/youtube.third-party-link.creator	Link to your YouTube channel, and add, remove, and edit the apps own info on your YouTube channel
YouTube Data API v3	.../auth/youtube.download	Download your public YouTube videos

**Test users** [EDIT](#)

1 user (1 test, 0 other) / 100 user cap

Filter table

User information

wilhelmwundtdigital@gmail.com

[BACK TO DASHBOARD](#)

# Setting up Credentials (2)

- On the dashboard page, click on "Credentials" in the menu on the top left

The screenshot shows the Google APIs & Services console interface. On the left sidebar, the 'Credentials' menu item is highlighted with a red arrow. The main content area displays the 'Publishing status' section for the 'YoutubeScraper' application. The 'Publishing status' section includes a 'Testing' tab with a 'PUBLISH APP' button, a 'User type' section with an 'External' toggle and a 'MAKE INTERNAL' button, and a 'Test users' section with an 'ADD USERS' button. The 'Test users' section also shows a progress bar indicating '1 user (1 test, 0 other) / 100 user cap'. The 'OAuth rate limits' section is partially visible at the bottom. On the right side of the console, there is a 'Learn' section with a list of links related to OAuth consent screens and app registration.

APIs & Services

OAuth consent screen

Learn

Dashboard

Library

**Credentials**

OAuth consent screen

Domain verification

Page usage agreements

YoutubeScraper

EDIT APP

Publishing status

Testing

PUBLISH APP

User type

External

MAKE INTERNAL

Test users

While publishing status is set to "Testing", only test users are able to access the app. Allowed user cap prior to app verification is 100, and is counted over the entire lifetime of the app. [Learn more](#)

+ ADD USERS

1 user (1 test, 0 other) / 100 user cap

SHOW MORE

OAuth rate limits

Your token grant rate

Google OAuth consent screen

What is the OAuth consent screen?

What are OAuth consent scopes?

What are sensitive API scopes?

What are restricted API scopes?

The app registration process

What information do I need?

Will my app need to be verified by Google?

What if I don't verify my app?

How long does the verification process take?

How many users can use my app?

Domain verification

What else should I review?

<https://console.developers.google.com/apis/credentials?project=youtubescraper-302516>

# Setting up Credentials (2)

- On the top, click on "Create Credentials" and select "OAuth Client ID" from the dropdown menu

The screenshot shows the Google APIs & Services console interface. On the left sidebar, the 'Credentials' section is selected. The main content area displays the 'Create Credentials' dropdown menu, which is open. A red arrow points to the '+ CREATE CREDENTIALS' button, and another red arrow points to the 'OAuth client ID' option in the dropdown. The dropdown menu lists three options: 'API key', 'OAuth client ID', and 'Service account'. Below the dropdown, there are three sections: 'API Keys', 'OAuth 2.0 Client IDs', and 'Service Accounts'. Each section has a table with columns for Name, Creation date, Type, and Client ID. The 'API Keys' section shows 'No API keys to display'. The 'OAuth 2.0 Client IDs' section shows 'No OAuth clients to display'. The 'Service Accounts' section shows 'No service accounts to display'.

Google APIs • YouTubeScraper

Search for APIs and Services

APIs & Services

Credentials + CREATE CREDENTIALS DELETE

Create credentials to access your project

API key  
Identifies your project using a simple API key to check quota and access

OAuth client ID  
Requests user consent so your app can access the user's data

Service account  
Enables server-to-server, app-level authentication using robot accounts

Help me choose  
Asks a few questions to help you decide which type of credential to use

API Keys

Name	Creation date	Type	Client ID
No API keys to display			

OAuth 2.0 Client IDs

Name	Creation date	Type	Client ID
No OAuth clients to display			

Service Accounts

Name	Email
No service accounts to display	

Manage service accounts

# Setting up Credentials (2)

- Select "Desktop App" as your application type and enter an arbitrary name for the set of credentials, then click on the blue "create" button

The screenshot shows the Google APIs & Services console interface. The left sidebar contains a menu with 'APIs & Services' selected. The main content area is titled 'Create OAuth client ID'. It includes a description of a client ID and a link to 'Learn more about OAuth client types'. There are two input fields: 'Application type \*' with a dropdown menu showing 'Desktop app', and 'Name \*' with the text 'YTScraper'. Below these fields are two buttons: 'CREATE' (highlighted with a red arrow) and 'CANCEL'. Red arrows also point to the 'Application type' dropdown and the 'Name' input field.

Google APIs YouTubeScraper Search for APIs and Services

APIs & Services

Dashboard  
Library  
Credentials  
OAuth consent screen  
Domain verification  
Page usage agreements

Create OAuth client ID

A client ID is used to identify a single app to Google's OAuth servers. If your app runs on multiple platforms, each will need its own client ID. See [Setting up OAuth 2.0](#) for more information.

Application type \*  
Desktop app

[Learn more](#) about OAuth client types

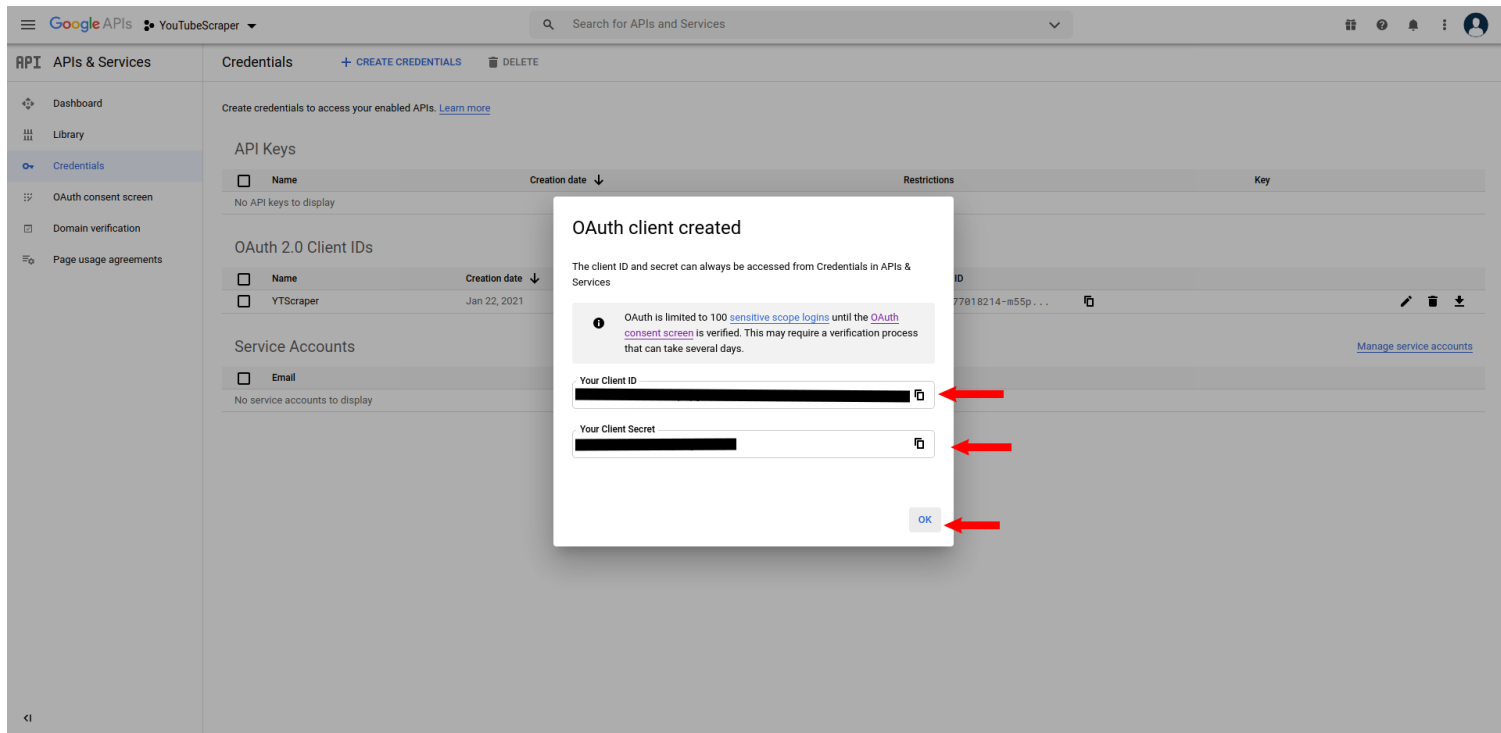
Name \*  
YTScraper

The name of your OAuth 2.0 client. This name is only used to identify the client in the console and will not be shown to end users.

CREATE CANCEL

# Setting up Credentials (2)

- Congratulations! You now have your own Client ID and secret! Next, copy both as a string into the R code shown on the following slide (and then run that code) to test your setup.



# Testing Access

- You can safely try whether your *YouTube* API access works as intended by running the following commands in R:

```
# installing the tuber package if not installed already
if("tuber" %in% installed.packages() != TRUE) {
  install.packages("tuber")
}

# loading tuber package
library(tuber)

# Your Credentials (NEVER SHARE THIS INFORMATION)
ID <- "ENTER-YOUR-CLIENT-ID"
secret <- "ENTER-YOUR-CLIENT-SECRET"

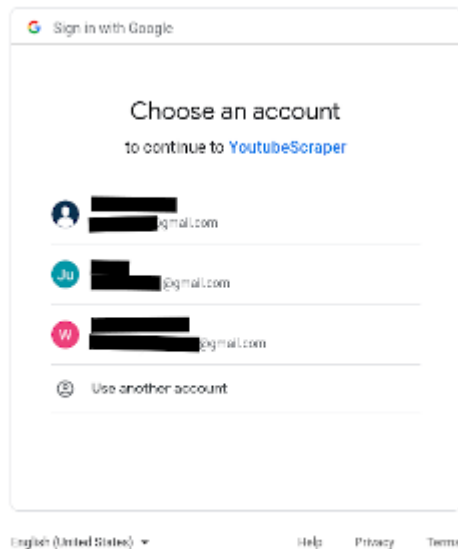
# authentication
yt_oauth(ID,secret)

# You will be asked in the R-console to
# save an access token: Select no by entering 2
# You will be sent to your browser to log in
```



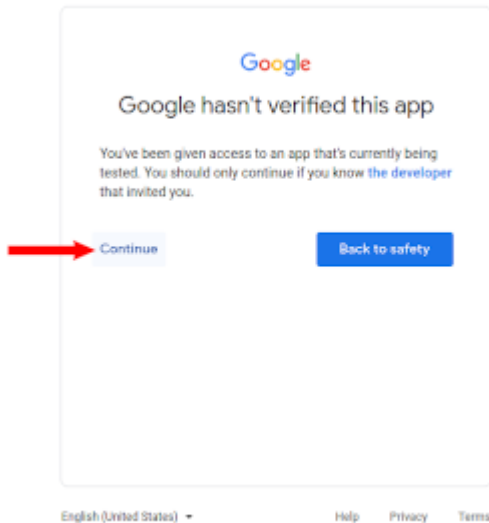
# Grant yourself access

- In the browser window that was opened from your R session, select your new Gmail account



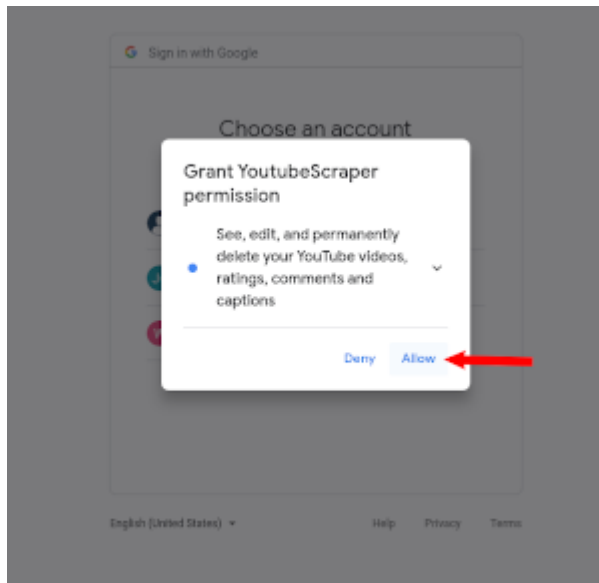
# Grant yourself access

- Google warns you that the app has not been verified, you can trust yourself and click on "continue"



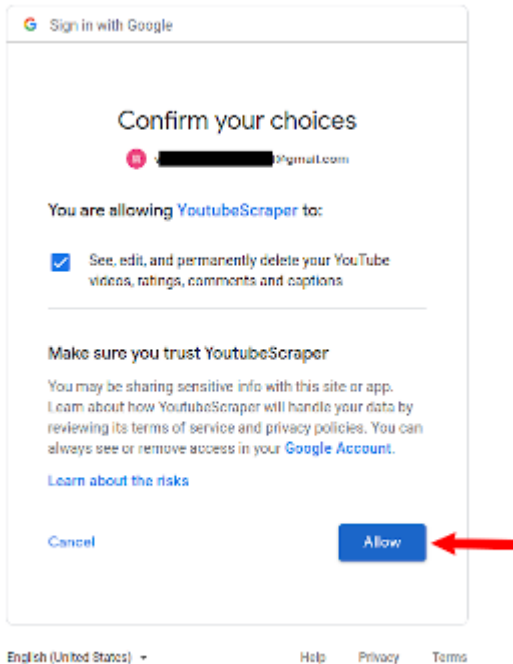
# Grant yourself access

- Allow the app (and hence yourself) to make changes to the account you created



# Grant yourself access

- confirm your choices once more by clicking on "Allow"



# Grant yourself access

- Your browser should now display the following message. You can close this window now and return to R.

Authentication complete. Please close this page and return to R.

---

# Test API call

- To easily check if everything worked, let's try to collect some simple data for a video.

```
# get statistics of https://www.youtube.com/watch?v=HluANRwPyNo  
get_stats(video_id="HluANRwPyNo")
```

# Output

- If everything worked correctly, your output structure should look something like this. The actual numbers will vary because they might change in the meantime.

```
$id  
[1] "HluANRwPyNo"  
  
$viewCount  
[1] "10244939"  
  
$likeCount  
[1] "509791"  
  
$dislikeCount  
[1] "4799"  
  
$favoriteCount  
[1] "0"  
  
$commentCount  
[1] "20581"
```

# A Few Words of Advice on Handling Your *YouTube API Access*

- Have one account and project ready for the workshop for which you know that it works
- Do not use your API access too excessively before the workshop to avoid any risk of it being suspended
- Never share your OAuth login credentials! This can easily happen by accident when:
  - saving code in a GitHub Repo
  - sending scripts to colleagues
  - troubleshooting someone else's code
  - for added security you can use the **keyring package** (we'll say a bit more about this in the workshop)



**We hope that you are now all set up and  
look forward to seeing you online!**