# Aggregation Lab Guide

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## Goals and objectives

The goal of this lab is to enable participants with aggregation pipelines. At the end of this lab, participants will understand:

* What an aggregation pipeline is
* How aggregation pipelines are different from simple MongoDB queries or SQL
* How to use simple aggregation pipelines to get data, filter it, and show particular fields
* How to write more advanced pipelines that query arrays, count documents, and sort the results

In addition to these goals, the lab also offers more advanced content that covers how to:

* Join collections using $lookup
* Group results
* Export data
* How to write aggregations using popular programming languages (TBD)

## Pre-requisites

This lab builds on top of the data modeling session. If the participants haven’t done that session, they should go through the [intro lab](https://mongodb-developer.github.io/intro-lab) first.

## Format

This is a 90-minute session. The speaker is expected to lecture no more than 30 minutes; the rest of the time is dedicated to hands-on activities. The participants should to follow the self-paced content during the hands-on parts of the session.

## Material

Agenda:

Slides: [Aggregation Lab Slides](https://docs.google.com/presentation/d/1x4bLowxF1yva8ZM3iL25HRQdfMSw-vBpluBcjIJW6ts/edit#slide=id.g158082dfe38_0_0)

Recording: [Recording](https://mongodb.zoom.com/rec/share/X8wheF5bnHpHbyzatclwIrynxxnpPt5a1Hxs7eWpgeX5Y__O_Fhtf0CcFFXN2va8.w5bgndECFcXWVmrm?startTime=1710434007000) Passcode: d9k\*$++n

Self-paced instructions: <https://mongodb-developer.github.io/aggregation-pipeline-lab/>

Self-paced GitHub repo: <https://github.com/mongodb-developer/aggregation-pipeline-lab>

Print Material: [Aggregation Lab Printed Material](https://docs.google.com/presentation/d/1FBSexRt8sFrLSH1uS4AoRp0QwNjzjI8lS2lgBfr79Y0/edit?usp=drive_link)

Lightning demo:

## Follow-up challenge

For the aggregation lab:

Do you remember how to build aggregation pipelines? Try to find the most prolific author in our library database. This will be the author who wrote the most pages. Hint: you’ll need to `unwind` the `authors` array as there might be more than one author per book.

Lost your cluster? Here are the instructions to get it back up and running: <https://mongodb-developer.github.io/intro-lab>

Can’t remember how to query your data, here’s the content you received at the event: <https://mdb.link/developer-day-toronto>

## Title and abstract

*Advanced Querying Techniques With Aggregation Pipelines*

Elevate your querying skills with this hands-on lab. Dive deep into MongoDB's aggregation pipeline framework, unraveling its potential to construct intricate queries. Join us for a hands-on experience, where you'll tackle exercises that empower you to use aggregation pipelines effectively. By the end, you'll wield the tools you need to conquer complexity and harness MongoDB's querying prowess.

## Code

All code samples can be found in the GitHub repository. Participants are expected to run those in mongosh (directly from a terminal running mongosh or from MongoDB Compass).

## Roadblocks and problems for attendees

At this point in a Developer Day, most of the technical problems should be solved: access to the internet and to the necessary accounts (MongoDB, GitHub, etc.). They should have done the Intro Lab, which is a prerequisite.

The main problem now is properly explaining that an aggregation pipeline is a composition of functions, a Turing Complete language as opposed to SQL where nesting subqueries lead to code that is difficult to read and maintain.

Start slow with the first examples, aimed at giving attendees the basic, familiar SELECT \* FROM table but written using an aggregation pipeline. Most problems will be non-matching curly braces, missing brackets, etc.

Stress the importance of treating this like any other piece of code, not as a long-winded SQL statement: break everything in smaller steps that can be reused and composed.