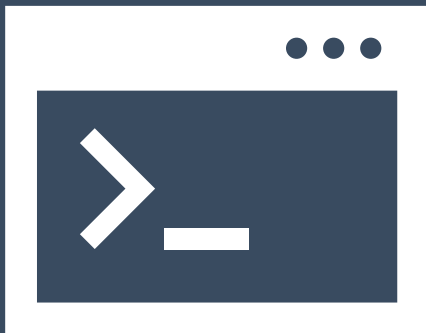


# Shell for Bioinformatics

<https://tinyurl.com/hbc-shell-materials>



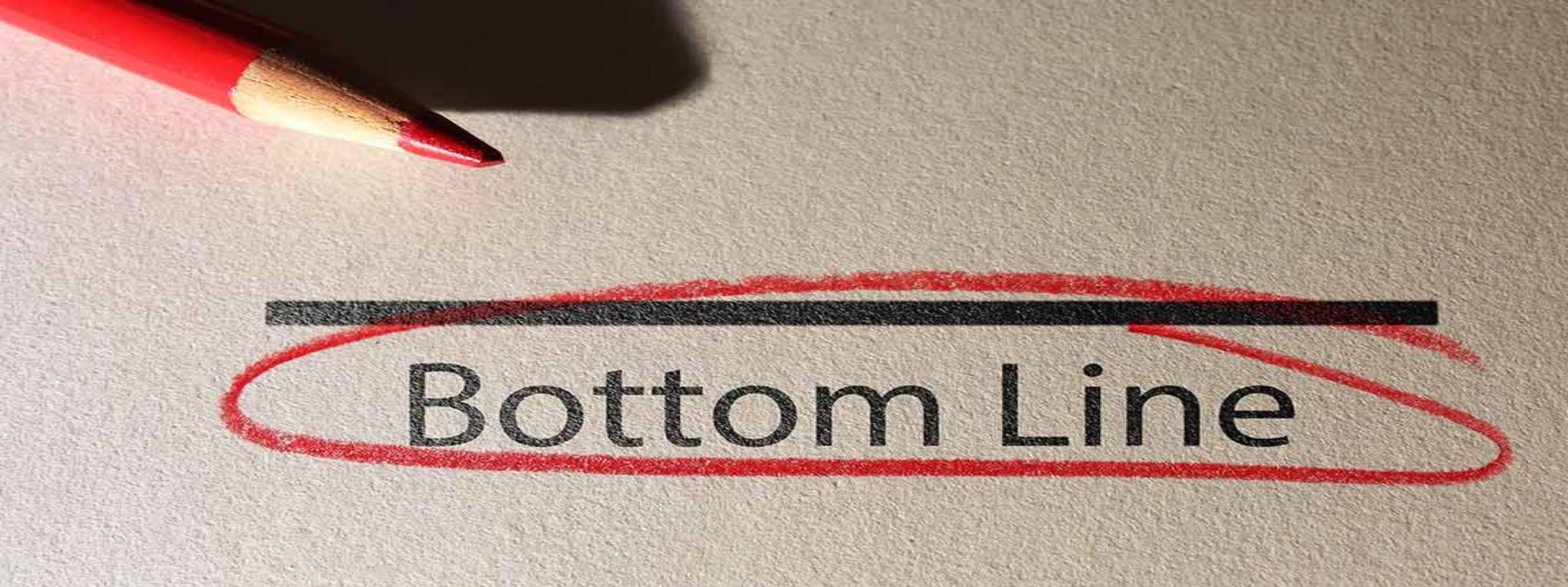
**Harvard Chan Bioinformatics Core**  
in collaboration with  
**HMS Research Computing**



# Learning Objectives



- ❖ Navigate around the command line interface (bash/shell)
- ❖ Create and manipulate text files
- ❖ Submit jobs to a high-performance computing cluster



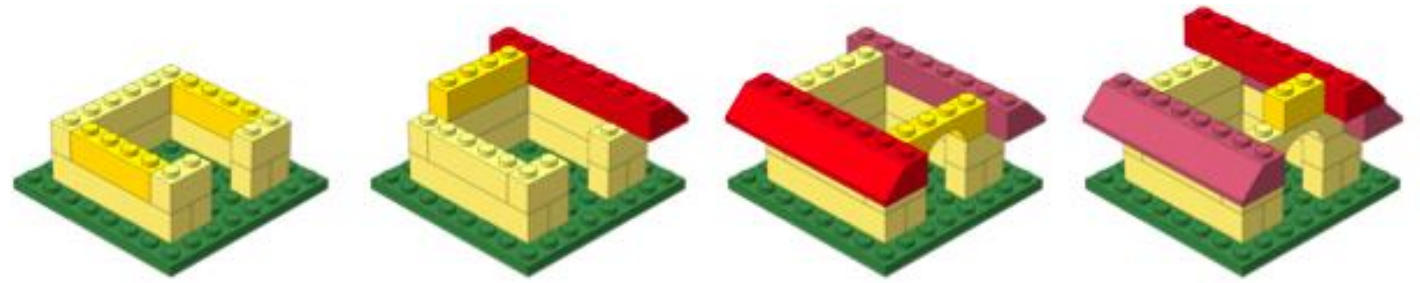
*Image source: Balboa Capital Blog*

If you plan to process raw high throughput sequencing data yourself, you will need to learn shell.

# Exit survey

<https://tinyurl.com/hbc-shell-exit>

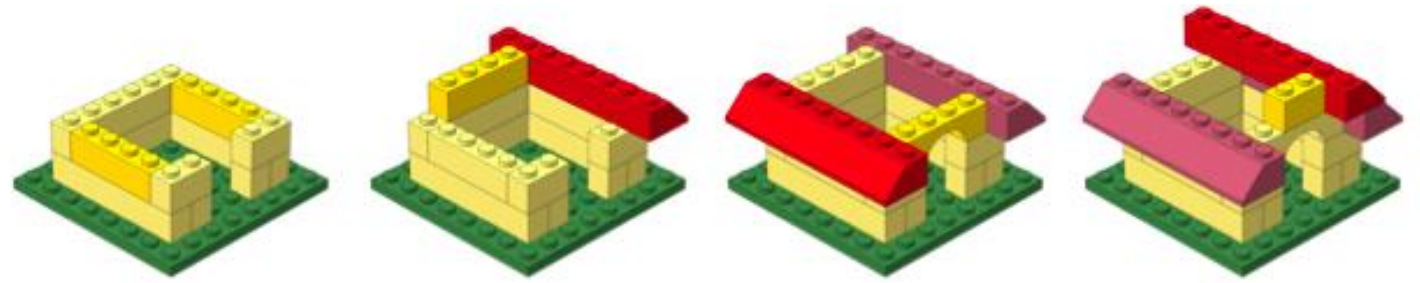
# Keep building!



Topic	Category	Date	Duration	Prerequisites
<a href="#">Investigating chromatin biology using ChIP-seq and CUT&amp;RUN</a>	Advanced	May 2, 6, 9	Three 2.5h sessions	<a href="#">Shell for Bioinformatics</a>
<a href="#">Introduction to Variant Analysis</a>	Advanced	May 20, 23, 27, 30	Four 2.5h sessions	<a href="#">Shell for Bioinformatics</a>
<a href="#">Introduction to R</a>	Basic	June 3, 6, 10, 13	Four 2h sessions	None
<a href="#">Introduction to Peak Analysis</a>	Advanced	July 8, 11, 15	Three 2.5h sessions	<a href="#">R</a>
<a href="#">Introduction to single-cell RNA-seq</a>	Advanced	September 9, 12, 16	Three 2.5h sessions	<a href="#">R</a>
<a href="#">Pseudobulk and related approaches for scRNA-seq analysis</a>	Advanced	October 21, 24, 28, 31	Four 2.5h sessions	<a href="#">R</a>
<a href="#">Tools for Reproducible Research</a>	Advanced	November 14, 18, 21	Three 2.5h sessions	<a href="#">R</a>



# Keep building!



Topic	Pre-requisites	Date	Time	Registration
Coding with Others: Managing Conflicts on GitHub	"Track Changes" for your code: An Introduction to Git and GitHub	5/21/25	1 - 4 pm	<a href="#">Register now!</a>
Statistics for Computational Biology Projects	None	6/18/25	1 - 4 pm	<a href="#">Register now!</a>
Deeper differential expression analysis with shrinkage correction	Foundations in R	7/16/25	1 - 4 pm	<a href="#">Register now!</a>

<https://bioinformatics.sph.harvard.edu/current-bioinformatics-topics-workshops>

# Get an O2 account!

[Home](#) > [Service Catalog](#)

Search IT services and kn

O2 Cluster Account

Description

What does it do?

Get an account on O2, the HMS High Performance Compute cluster

Available To

Who is eligible?

Any HMS or HMS-affiliated researcher who has an HMS eCommons account.

Cost

What does it cost?

There is no cost to labs whose PI has a primary or secondary faculty appointment in an HMS Quad department.

If the PI of your lab does not have a primary or secondary faculty appointment in an HMS Quad department, cluster usage will be charged for beginning later in 2021. Please see the following page for current details about rates: <https://it.hms.harvard.edu/rc/core/rates>.

Support

Please fill out the [online help request form](#), or email [rchelp@hms.harvard.edu](mailto:rchelp@hms.harvard.edu).

How to Access

How do I get it?

Two-factor authentication is required to request an account on O2, as well as for O2 logins once your account is created. Harvard University uses a mobile app called Duo that makes the process quick and easy. Even if you already use Duo for HarvardKey, you will still need to setup a Duo profile for HMS.

- [Setup HMS two-factor Authentication \(HMS Duo Mobile\)](#)
- [Reactivate or Reconnect HMS two-factor Authentication \(HMS Duo Mobile\)](#)

Once you have Duo set up, Click the "Get Service" link to login and complete the request form.

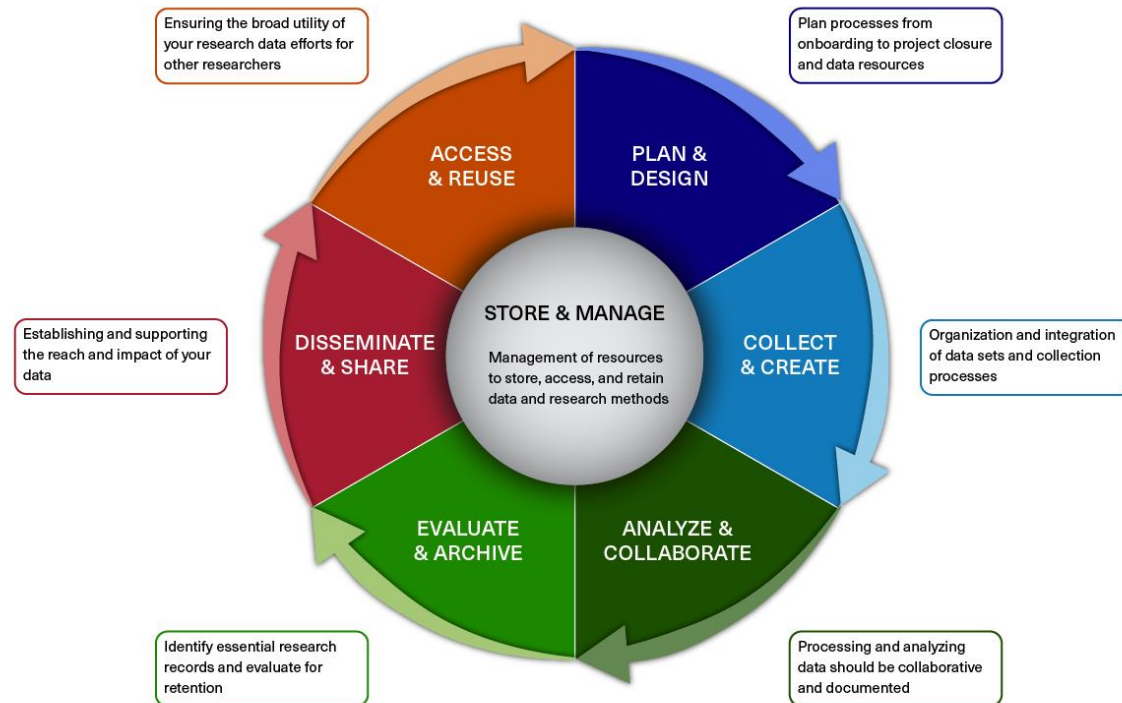
Get this service

Learn more

Don't see what you're looking for?

# Research Data Management (RDM)


## BIOMEDICAL RESEARCH DATA LIFECYCLE





# Spring 2025 Data Lifecycle Training

## Plan & Design

**February 11** 


Data Management  
Offboarding for  
Research Projects

**March 19**  

A Guide to Efficient  
Research Practices


**March 26**  

Tips and Tricks for Writing  
an Actionable Data  
Management Plan


**May 21** 

Research Data  
Stewardship Basics


## Collect & Analyze

**January 29** 


Data Literacy:  
Introduction to GIS

**February 19** 


Foundations in R

**March 19** 

Reproducible Research  
using RMarkdown


**April 16** 

An Introduction to Git  
and GitHub


**May 21** 

Managing Conflicts  
on GitHub


## Store & Evaluate

**March 10** 

Introduction to the  
General Records Schedule


**April 7** 

Managing Paper Records:  
Off-Site Records Storage



**April 21** 

Managing Electronic  
Records: Shared Drives  
and Emails


## Share & Publish

**February 27** 


Research Management:  
Open Access Publishing

**April 9**  

Research Management:  
Closing Out Your Research

**April 23** 

Data Sharing with  
Harvard Dataverse

 In-person

 Virtual



**Learn More & Register**  
[bit.ly/rdmwg-calendar](https://bit.ly/rdmwg-calendar)



<https://datamanagement.hms.harvard.edu/about/news-events/rdmwg-calendar>

# Better RDM practice benefits you

- ❖ HMS Data Management LMA

- ❖ Webpage: <https://datamanagement.hms.harvard.edu>

- ❖ Sign up for quarterly email updates

- ❖ Harvard-wide Research data Management

- ❖ <https://researchdatamanagement.harvard.edu/>

# Join us for HBC Community Breakfast!

- ❖ An opportunity to get to know others in the community
- ❖ Free food and beverages
- ❖ Great conversations



**Thursday May 8<sup>th</sup>, 2024  
9:00 to 10:30am**

**More Info:**

<http://bioinformatics.sph.harvard.edu/breakfast/>

# Thanks!

- ❖ Kathleen Chappell and Andy Bergman from HMS-RC
- ❖ Data Carpentry

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*These materials have been developed by members of the teaching team at the Harvard Chan Bioinformatics Core (HBC). These are open access materials distributed under the terms of the Creative Commons Attribution license (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*

# Contact Us

- ❖ *HBC training team:* [hbctraining@hsph.harvard.edu](mailto:hbctraining@hsph.harvard.edu)
- ❖ *HBC consulting:* [bioinformatics@hsph.harvard.edu](mailto:bioinformatics@hsph.harvard.edu)
- ❖ *O2 (HMS-RC):* [rchelp@hms.harvard.edu](mailto:rchelp@hms.harvard.edu)