

Lab 1

[Click here to Register Attendance](https://forms.gle/pesShFDe1ibVfS3L7)

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| When completed, please upload this Lab document to the Assessments page - Lab 1 | |

### **Part A - GitHub**

1. Go to <http://github.com>
2. Sign up for a GitHub Account (make sure to use your IT Sligo student email address when you signup as this will entitle you to a free Student that includes 5 free private repositories.
3. Enter your GitHub username here and also enter it into this [form](https://forms.gle/2WXr81guCMnnAb989):

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| https://github.com/ronanmccormack-ca |

1. Once your account has been setup, try creating a new Repository called **firstrepo** using the Add Repository button below your profile picture.
2. Use the Add File button to add a new file to your repository, give your new file a name, type some text and save the file.
3. On your Laptop/Desktop, install GitHub Desktop from here: <https://desktop.github.com/>
4. Using GitHub Desktop, Clone a repository from your GitHub account to your laptop/computer
5. On your Laptop/Desktop, create a repository called **secondrepo**
6. In your secondrepo folder add a file and save it, then **commit** the change and **push** it to your GitHub account
7. Paste a screenshot here of your pushed **secondrepo** repository on GitHub.com**Part B - Choose one of B1 or B2 (next page)**

### **B1 - Installing Hadoop Locally (Requires 16GB RAM)**

1. Go to VirtualBox.org downloads - <https://www.virtualbox.org/wiki/Downloads>
2. Download VirtualBox - I’m using version 6
3. Install Virtual Box and post a screenshot here

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1. Download the HortonWorks HDP Sandbox version 2.5:  
   (HortonWorks merged with Cloudera in 2019)  
   Select HDP environment: <https://www.cloudera.com/downloads.html>   
   Fill in your information in the downloads registration page  
   Select the HDP Sandbox 2.5 - download file called HDP\_2.5\_virtualbox.ova
2. Import HDP Sandbox 2.5 into VirtualBox and power it on and post a screenshot here

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1. Explore your Hadoop ecosystem using the Ambari browser interface:  
   Open a browser window and enter: 127.0.0.1:8888  
   Login: maria\_dev  
   Password: maria\_dev  
   and post a screenshot here

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1. Write a short description of what you understand is going on in each step
   1. Steps 1 to 5 are installing the virtual environment and importing the HDP Sandbox into the virtual environment.
   2. In Step 6 the HDP sandbox is running locally on my computer and I can access it via the web browser to explore its features.
2. Add a screenshot of each step executing

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### **B2 - Installing Hadoop on Google Colab & Running a MapReduce op**

1. Create a new Notebook in [Google Colab](https://www.google.ie/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj36-WQ1ND1AhXTVsAKHet9AWUQFnoECAUQAQ&url=https%3A%2F%2Fcolab.research.google.com%2F&usg=AOvVaw3A5aPK2kLFzKOzb6sOckVw) and call it Hadoop - Getting Started
2. Add and run the following cells:

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| # Install java  !apt-get install openjdk-8-jdk-headless -qq > /dev/null |
| #create java home variable  import os  os.environ["JAVA\_HOME"] = "/usr/lib/jvm/java-8-openjdk-amd64"  os.environ["SPARK\_HOME"] = "/content/spark-3.0.0-bin-hadoop3.2" |
| #download hadoop  !wget https://downloads.apache.org/hadoop/common/hadoop-3.3.0/hadoop-3.3.0.tar.gz |
| #we’ll use the tar command with the -x flag to extract, -z to uncompress,  #-v for verbose output, and -f to specify that we’re extracting from a file  !tar -xzvf hadoop-3.3.0.tar.gz |
| #copying the hadoop file to user/local  !cp -r hadoop-3.3.0/ /usr/local/ |
| #finding the default Java path  !readlink -f /usr/bin/java | sed "s:bin/java::" |
| #Running Hadoop  !/usr/local/hadoop-3.3.0/bin/hadoop |
| !mkdir ~/input |
| !cp /usr/local/hadoop-3.3.0/etc/hadoop/\*.xml ~/input |
| !ls ~/input |
| !/usr/local/hadoop-3.3.0/bin/hadoop jar /usr/local/hadoop-3.3.0/share/hadoop/mapreduce/hadoop-mapreduce-examples-3.3.0.jar grep ~/input ~/grep\_example 'allowed[.]\*' |
| Adapted from <https://www.analyticsvidhya.com/blog/2021/05/integration-of-python-with-hadoop-and-spark/> |

1. Write a short description of what you understand is going on in each cell
2. Add a screenshot of each cell executing
3. Include a URL to your working Google Colab notebook here:

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| <https://colab.research.google.com/github/ronanmccormack-ca/ProgrammingforBigData/blob/main/Hadoop_Getting_Started.ipynb> |