**IBM Cloud**

DEEP BELIEF NETWORK

Training a model for visual recognition using deep belief

networks and IBM Data Science Experience

Edit Sub-Title

**Lab Guide**

Notices and Disclaimers

© Copyright IBM Corporation 2017.

The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. This information is based on current IBM product plans and strategy, which are subject to change by IBM without notice. Product release dates and/or capabilities referenced in these materials may change at any time at IBM’s sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

IBM, the IBM logo and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at ibm.com/legal/copytrade.shtml

Other company, product and service names may be trademarks or service marks of others

**Table of Contents**

[Lab Environment Overview 4](#_Toc503523387)

[Module 1: Deep Belief Networks in DSX 5](#_Toc503523388)

[Module 1: Lab Workflow Overview 6](#_Toc503523389)

[Lab Instructions 7](#_Toc503523390)

[Conclusion: 24](#_Toc503523391)

# Lab Environment Overview

# Module 1: Deep Belief Networks in DSX

|  |  |
| --- | --- |
| Purpose: | The purpose of this lab is to set up an IBM Cloud Account, access and run notebook in DSX, and program a deep belief network for visual recognition.  By the end of this lab, you will be familiar with the following:   * Navigating IBM Data Science Experience * Creation and use of deep belief networks * Familiarity with Cloud Services |
|  |  |
| Tasks: | Tasks you will complete in this lab exercise include:   * Set up your IBM Account with DSX * Lean, Create, Collaborate! * Hands-on, Create and Collaborate * Conclusion |

## Module 1: Lab Workflow Overview

## Lab Instructions

| Step | Action |
| --- | --- |
| 1 | **Set up your IBM Cloud Account with DSX**   1. Log into IBM Data Science Experience at <http://datascience.ibm.com/> 2. Click “Sign Up”.      1. This will direct you to the Watson Data Platform. Follow the instructions to set up a new account.        1. You will need to log into your email account to confirm and complete account registration. 2. Select the “Confirm Account” link in the email to be redirected to IBM Cloud.        1. When you first sign into your new account, you will need to select and organization and space. 2. We will be using the default options for this lab. Click “Continue”.        1. Once you see that the Object-Storage is done provisioning, click “Get Started”. |
| 2 | **Part 2: Learn, Create, Collaborate!**   1. Click “Community on the top tab.      1. Scroll down to the tutorials and click on “Rapidly build Machine Learning flows with DSX” to open the tutorial.        1. Once you’re done reviewing the tutorial, close the tab to return to the main area of DSX. 2. Click “Articles”, and hover over several cards to see a summary of the types of articles added in the community.      1. Click “Data Sets”. 2. Type into the search bar, “Customer demographics and sales”.      1. Look at the data.      1. Exit the data set by clicking on the back arrow.      1. Once we have created some projects to organize our work, we can add these datasets to them by clicking on the plus sign on the bottom of the card or bookmarking them to add them to the project as well as save their location for future reference.      1. Click “ Notebooks”.      1. Roll your mouse over several notebooks to read the descriptions of what is available. Note that we can type in a keyword if we prefer to search rather than browse. 2. Type ML into the search and notice how the notebooks filter to those applicable to the search term |
| 3 | **Part 3: Hands-on, Create and Collaborate**   1. Click “Watson Data Platform” on the top left corner of the screen to return to the home page of DSX. 2. Click “New Project”.      1. Name your project “Image Classification”. 2. Click “Create” once all fields are completed.      1. We now have a project workspace created.        1. Click on the collaborators tab and click “add collaborator”      1. Since we did not restrict collaborators we can add anyone with an email address to this project and they can contribute as well as see the progress we’re making. 2. Add a secondary email address for yourself, or if you wish add me or Erika to your project:   [ereuter@us.ibm.com](mailto:ereuter@us.ibm.com)  [erika.bratschun@ibm.com](mailto:erika.bratschun@ibm.com)   1. Maybe you don’t trust us to make any edits to your notebooks, so set us as viewers, click add then invite.      1. Enter your project environment and click “New notebook”.      1. Click on the URL tab and fill in the fields as below. 2. Provide the name “Image Classification” 3. Enter the below link for the notebook URL: <https://github.com/ericareuter/F2F/blob/master/Use%2Bdeep%2Blearning%2Bfor%2Bimage%2Bclassification.ipynb>   The default spark service will be used, no need to make changes.   1. Click “Create Notebook” once all fields are completed.      1. Once the notebook is created it will open automatically.      1. Click the edit icon (pencil) to allow for interactivity with the notebook if it is not already in edit mode.      1. If you do not see a blue space to the right side of the screen, click the data (1001) button to open it.      1. Now we’re ready to look at how this image classification is done in a coding environment.   *Run cell 1*   1. To do this, click on the play button.     *Run cell 2*    *Run cells 3 and 4*    *Run cell 5*    *Run cell 6*      *Run cell 7*    Run the rest of the cells one by one. These will randomly select an image from MNIST, run it through the DBN, and make a prediction on what digit is written. |
| 4 | **Conclusion** Conclusion: Now that you have successfully completed this lab, you should be able to:   * Navigate IBM Data Science Experience * Create and use deep belief networks * Have familiarity with Cloud Services |
| 5 |  |