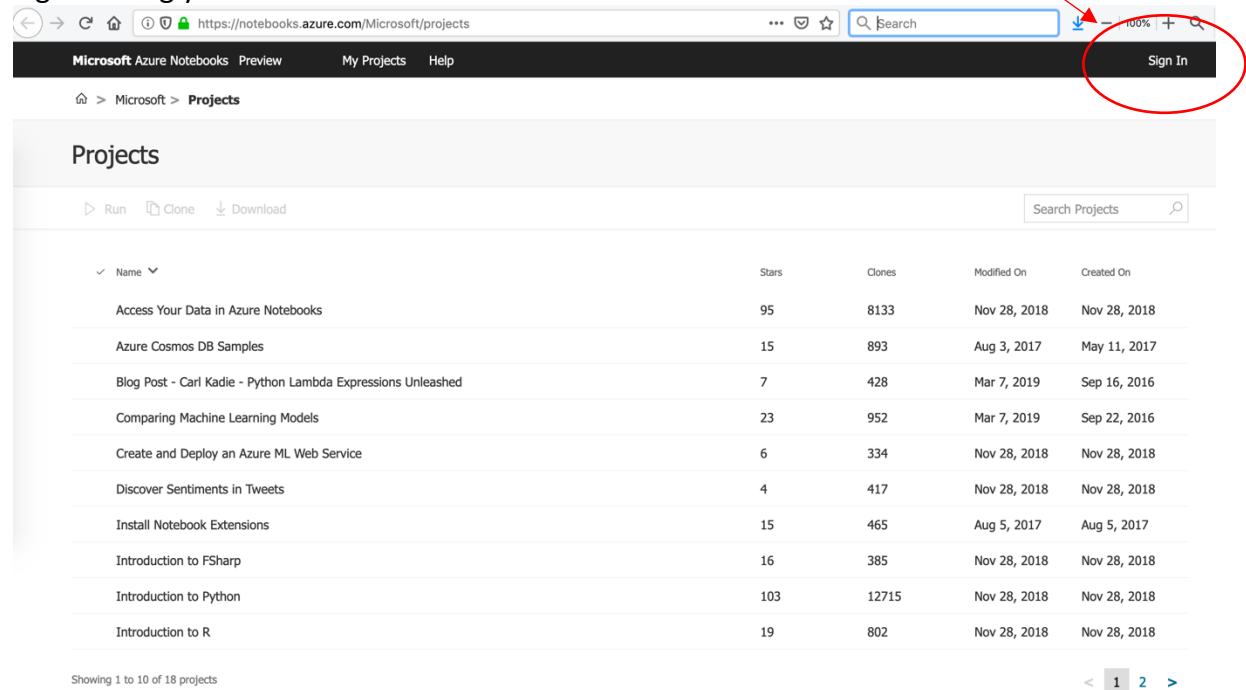


We will use the Jupyter Notebook in the azure cloud server.

Access:

<https://notebooks.azure.com/Microsoft/projects>

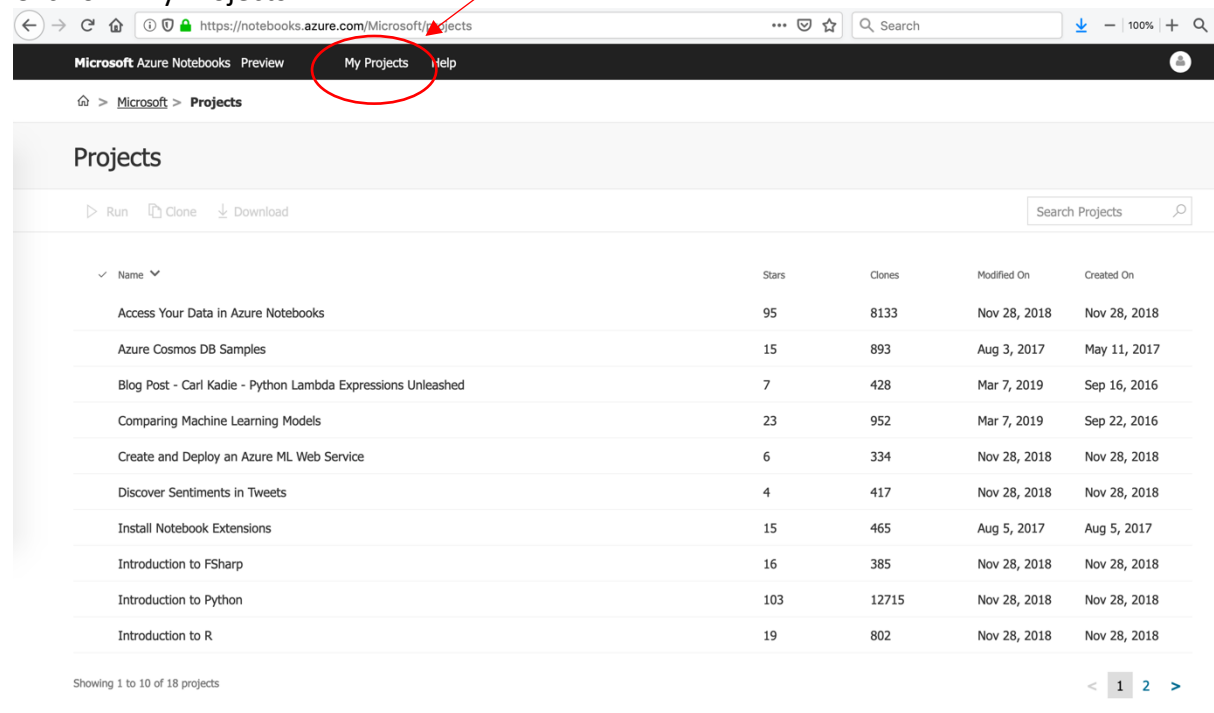
Sign in using your UWA number.



The screenshot shows the Microsoft Azure Notebooks interface. The top navigation bar includes links for 'Microsoft Azure Notebooks', 'Preview', 'My Projects', and 'Help'. A red circle highlights the 'Sign In' button in the top right corner. Below the navigation bar, the 'Projects' section is displayed, featuring a table of projects with columns for Name, Stars, Clones, Modified On, and Created On. The table lists 10 projects, including 'Access Your Data in Azure Notebooks', 'Azure Cosmos DB Samples', and 'Blog Post - Carl Kadie - Python Lambda Expressions Unleashed'. A search bar and pagination controls are also visible.

Name	Stars	Clones	Modified On	Created On
Access Your Data in Azure Notebooks	95	8133	Nov 28, 2018	Nov 28, 2018
Azure Cosmos DB Samples	15	893	Aug 3, 2017	May 11, 2017
Blog Post - Carl Kadie - Python Lambda Expressions Unleashed	7	428	Mar 7, 2019	Sep 16, 2016
Comparing Machine Learning Models	23	952	Mar 7, 2019	Sep 22, 2016
Create and Deploy an Azure ML Web Service	6	334	Nov 28, 2018	Nov 28, 2018
Discover Sentiments in Tweets	4	417	Nov 28, 2018	Nov 28, 2018
Install Notebook Extensions	15	465	Aug 5, 2017	Aug 5, 2017
Introduction to FSharp	16	385	Nov 28, 2018	Nov 28, 2018
Introduction to Python	103	12715	Nov 28, 2018	Nov 28, 2018
Introduction to R	19	802	Nov 28, 2018	Nov 28, 2018

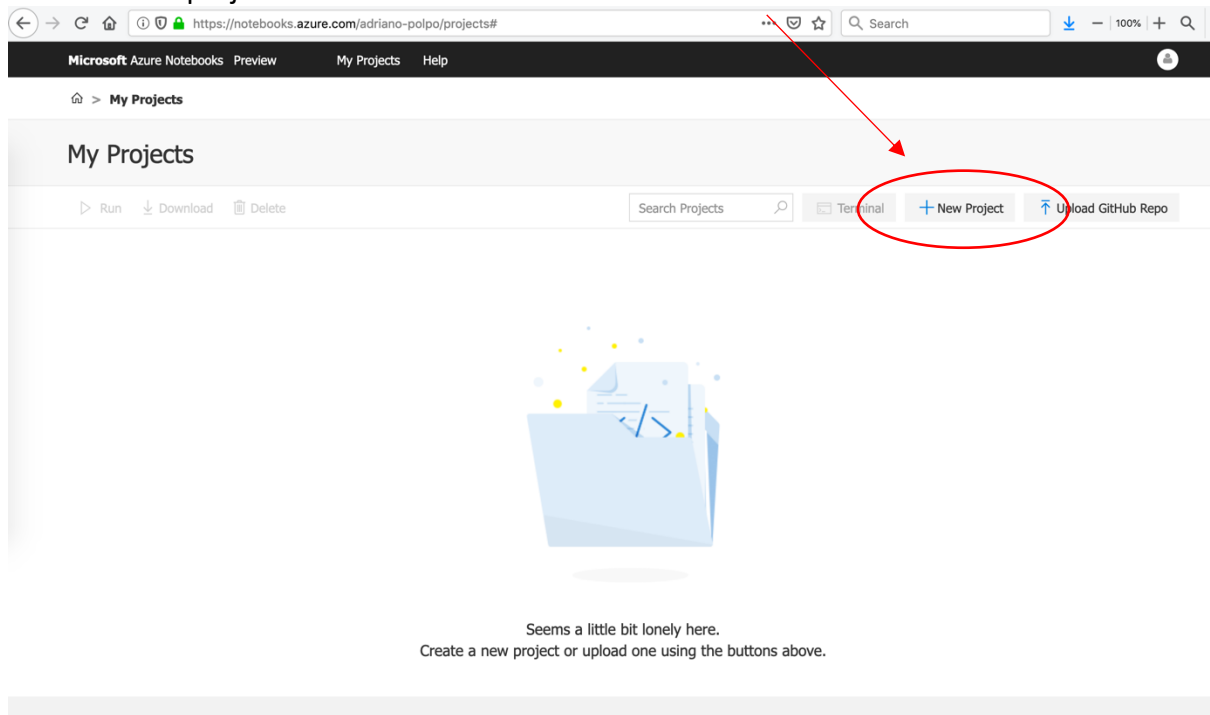
Click on "My Projects".



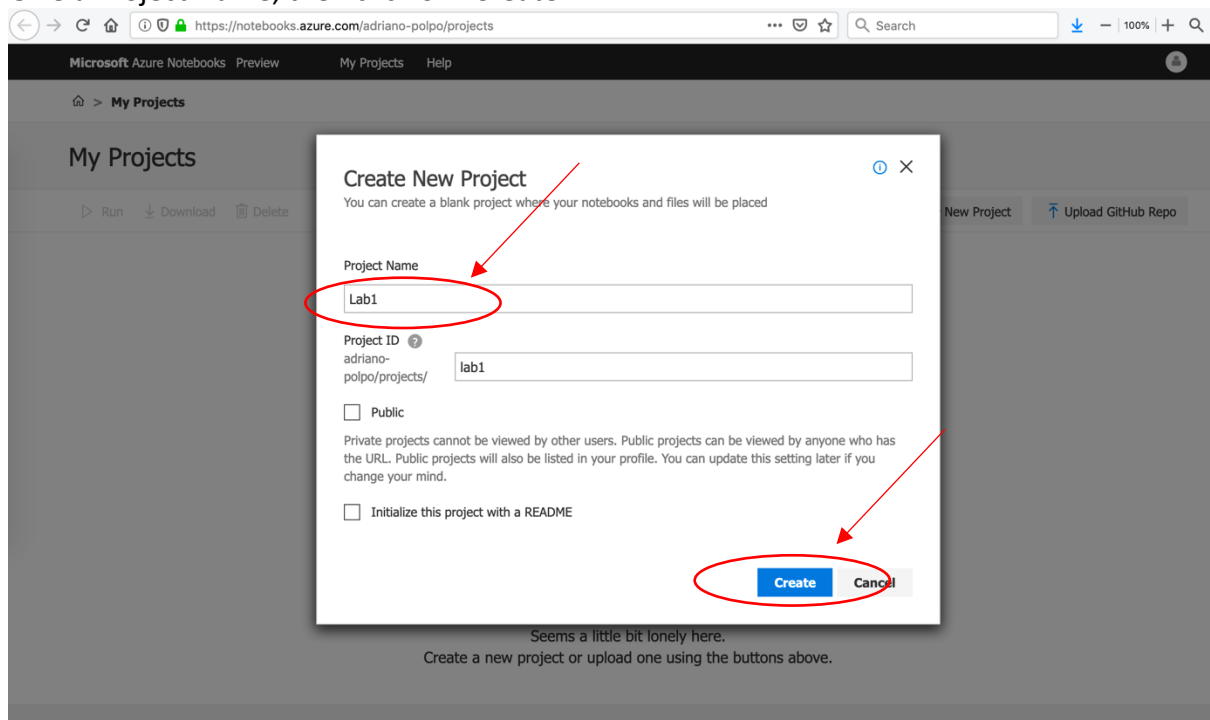
The screenshot shows the Microsoft Azure Notebooks interface with the 'My Projects' link in the navigation bar highlighted by a red circle. The 'Projects' section displays the same table of projects as the previous screenshot, showing 10 projects with their respective statistics and dates. The interface includes a search bar and pagination controls at the bottom.

Name	Stars	Clones	Modified On	Created On
Access Your Data in Azure Notebooks	95	8133	Nov 28, 2018	Nov 28, 2018
Azure Cosmos DB Samples	15	893	Aug 3, 2017	May 11, 2017
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Create a new project.



Give a Project Name, then click on "Create".



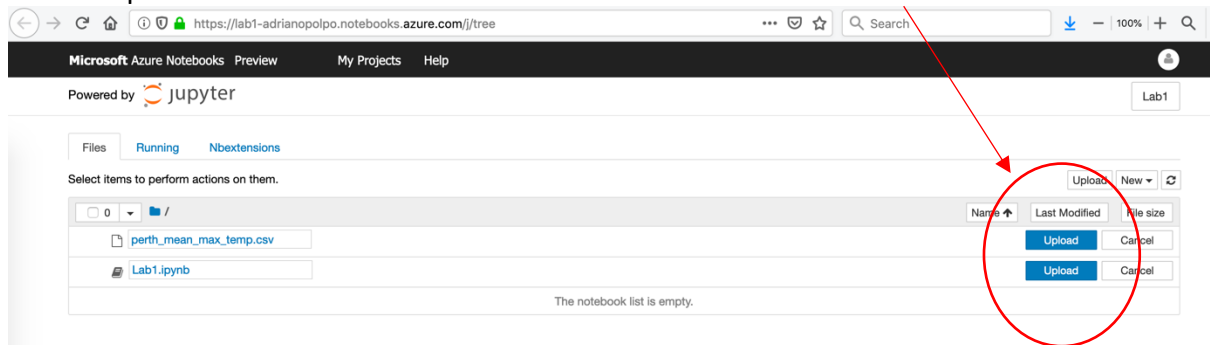
Click to start a session, running on Free Compute.

The screenshot shows the Microsoft Azure Notebooks interface for a project named 'Lab1'. The status is 'Stopped'. A red arrow points to the 'Run on Free Co...' button, which is circled in red. The interface includes a navigation bar with 'Microsoft Azure Notebooks', 'Preview', 'My Projects', and 'Help'. Below the navigation bar, there's a header for 'Lab1' with 'Clone' and 'Star' buttons. The main area displays a message: 'This project is empty. Start your project by creating or uploading a file using the buttons above.' There is also a search bar and a 'Show hidden items' button.

Click to upload the files (perth\_mean\_max\_temp.csv and Lab1.ipynb).

The screenshot shows the file upload interface of the Microsoft Azure Notebooks. The 'Upload' button is circled in red. The interface includes a navigation bar with 'Microsoft Azure Notebooks', 'Preview', 'My Projects', and 'Help'. Below the navigation bar, there's a header for 'Lab1' with 'Powered by jupyter'. The main area displays a message: 'The notebook list is empty.' There is also a search bar and a 'Show hidden items' button.

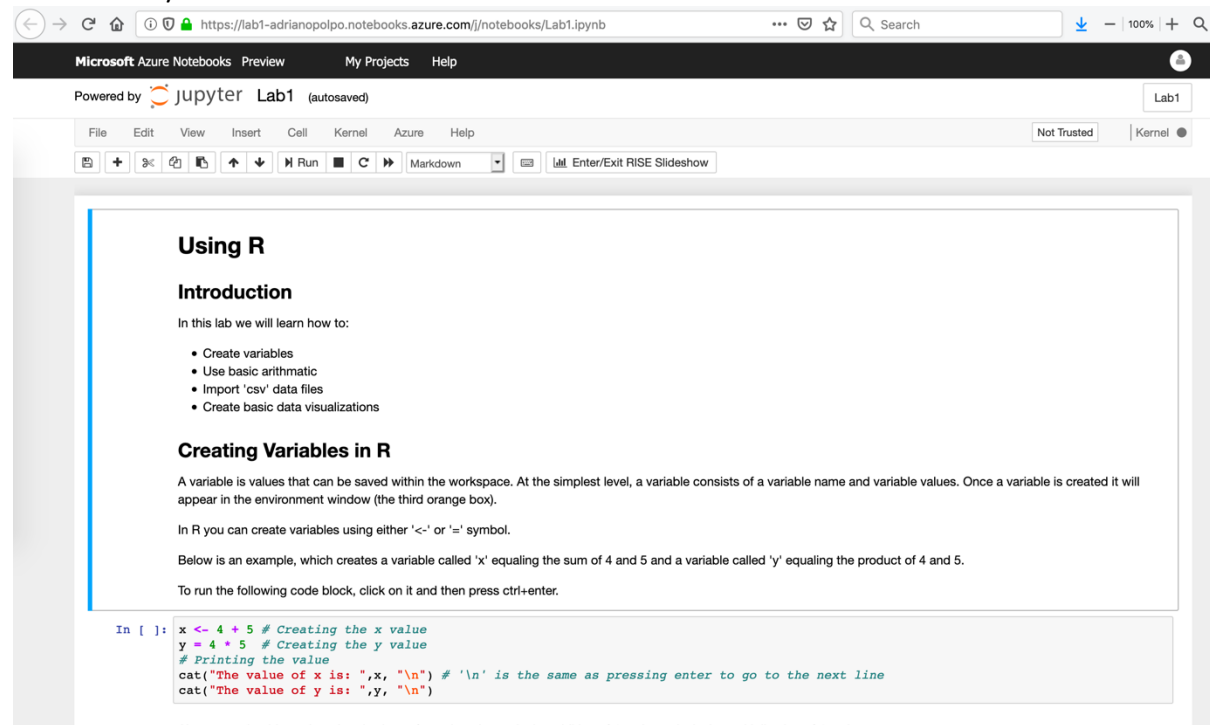
Click to upload each file.



After upload, click on "Lab1.ipynb"



This is our work environment. To do your Lab, you must read and follow the instructions/exercises in the file.



**Using R**

**Introduction**

In this lab we will learn how to:

- Create variables
- Use basic arithmetic
- Import 'csv' data files
- Create basic data visualizations

**Creating Variables in R**

A variable is values that can be saved within the workspace. At the simplest level, a variable consists of a variable name and variable values. Once a variable is created it will appear in the environment window (the third orange box).

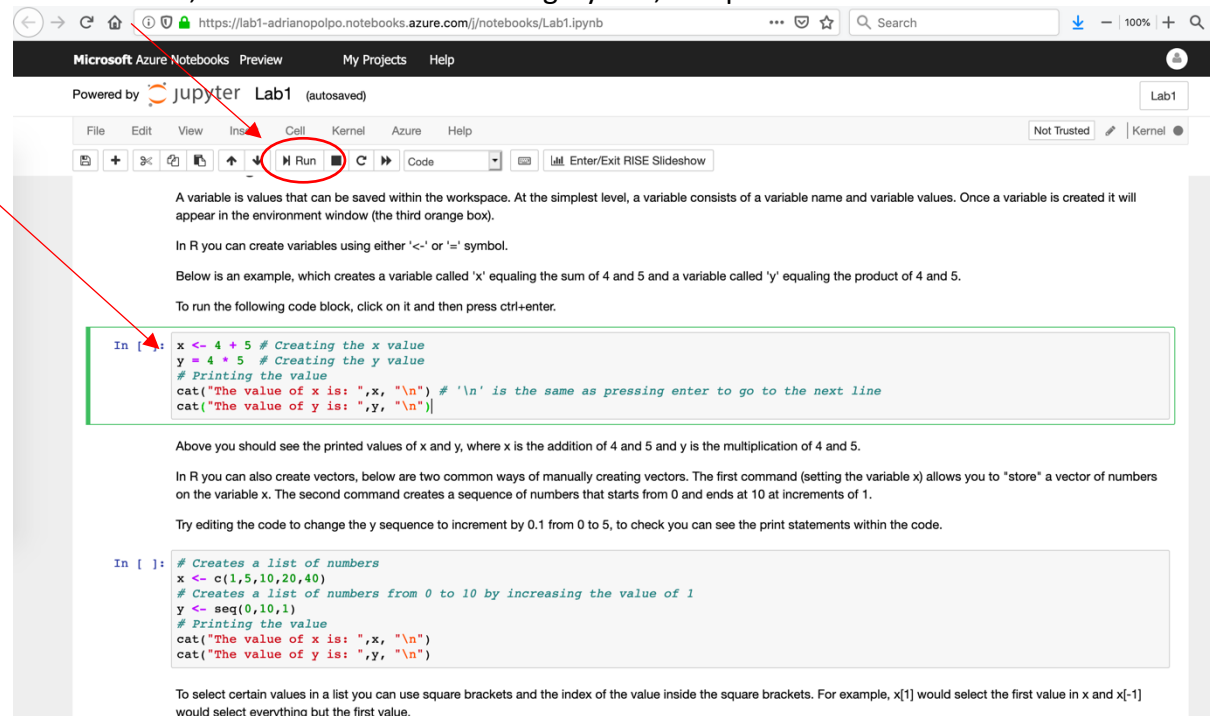
In R you can create variables using either '<-' or '=' symbol.

Below is an example, which creates a variable called 'x' equaling the sum of 4 and 5 and a variable called 'y' equaling the product of 4 and 5.

To run the following code block, click on it and then press ctrl+enter.

```
In [ ]: x <- 4 + 5 # Creating the x value
        y = 4 * 5 # Creating the y value
        # Printing the value
        cat("The value of x is: ",x, "\n") # '\n' is the same as pressing enter to go to the next line
        cat("The value of y is: ",y, "\n")
```

To run a code, click in the last line of the grey box, and press ctrl+enter or click on “Run”.



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        cat("The value of x is: ",x, "\n") # '\n' is the same as pressing enter to go to the next line
        cat("The value of y is: ",y, "\n")
```

Above you should see the printed values of x and y, where x is the addition of 4 and 5 and y is the multiplication of 4 and 5.

In R you can also create vectors, below are two common ways of manually creating vectors. The first command (setting the variable x) allows you to "store" a vector of numbers on the variable x. The second command creates a sequence of numbers that starts from 0 and ends at 10 at increments of 1.

Try editing the code to change the y sequence to increment by 0.1 from 0 to 5, to check you can see the print statements within the code.

```
In [ ]: # Creates a list of numbers
        x <- c(1,5,10,20,40)
        # Creates a list of numbers from 0 to 10 by increasing the value of 1
        y <- seq(0,10,1)
        # Printing the value
        cat("The value of x is: ",x, "\n")
        cat("The value of y is: ",y, "\n")
```

To select certain values in a list you can use square brackets and the index of the value inside the square brackets. For example, x[1] would select the first value in x and x[-1] would select everything but the first value.

To “turn-off” your machine, click on “File”, and them on “Close and Halt”.

The screenshot shows the Microsoft Azure Notebooks interface. The browser address bar displays the URL: <https://lab1-adrianopolpo.notebooks.azure.com/j/notebooks/Lab1.ipynb>. The interface includes a top navigation bar with "Microsoft Azure Notebooks", "Preview", "My Projects", and "Help". Below this, it says "Powered by jupyter Lab1 (autosaved)". The main menu bar includes "File", "Edit", "View", "Insert", "Cell", "Kernel", "Azure", and "Help". The "File" menu is open, showing options like "New Notebook", "Open...", "Upload...", "Download...", "Make a Copy...", "Rename...", "Save and Checkpoint", "Revert to Checkpoint", "Print Preview", "Download as", "Trust Notebook", and "Close and Halt". The "Close and Halt" option is circled in red. The main content area shows a Jupyter Notebook with a title "Introduction" and a section "Creating Variables in R". The notebook content includes text explaining variables in R and a code block with the following R code:

```
In [ ]: x <- 4 + 5 # Creating the x value
y = 4 * 5 # Creating the y value
# Printing the value
cat("The value of x is: ", x, "\n") # '\n' is the same as pressing enter to go to the next line
cat("The value of y is: ", y, "\n")
```