



Linux Introduction

Why Use Linux?

Windows ROS2 Install

- Use Windows 10
- Install Chocolatey
- Install Python
- Install Visual C++ Redistributables
- Install OpenSSL
- Install Visual Studio 2019
- Install OpenCV
- Install Chocolatey and Python dependencies
- Install RQt dependencies
 - Install PyQt5
 - Install QT
- Install Graphviz

Linux ROS2 Install

- Enter commands in terminal



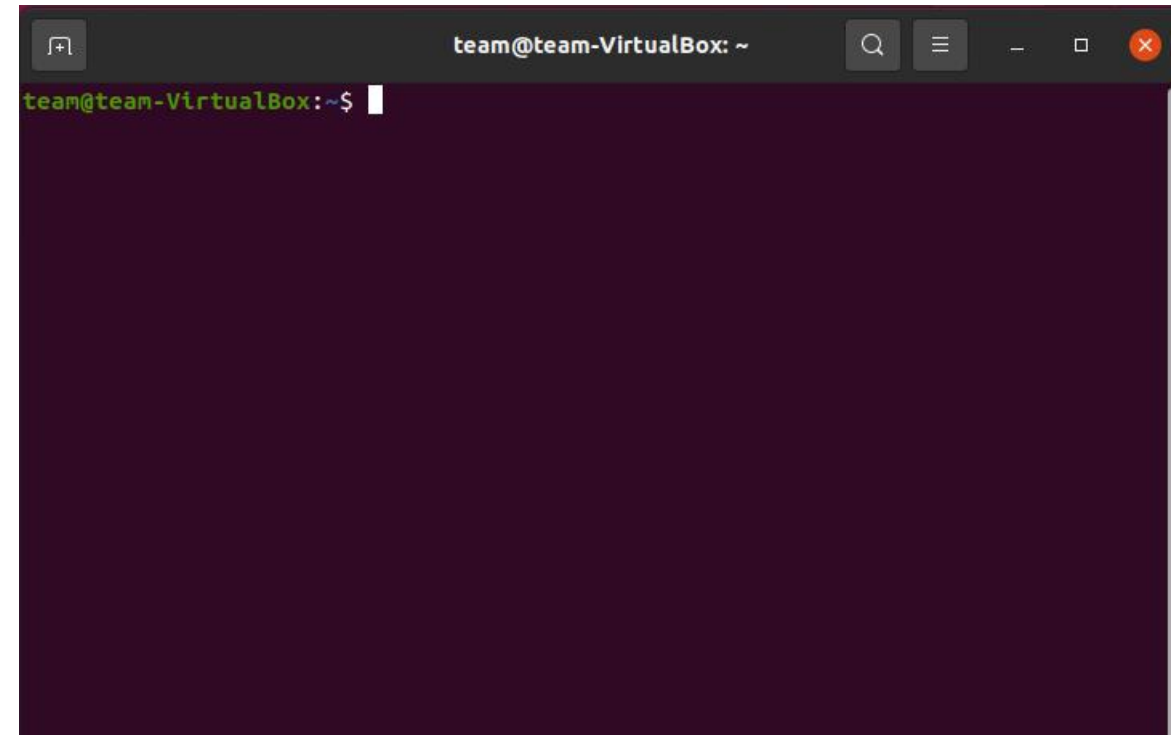
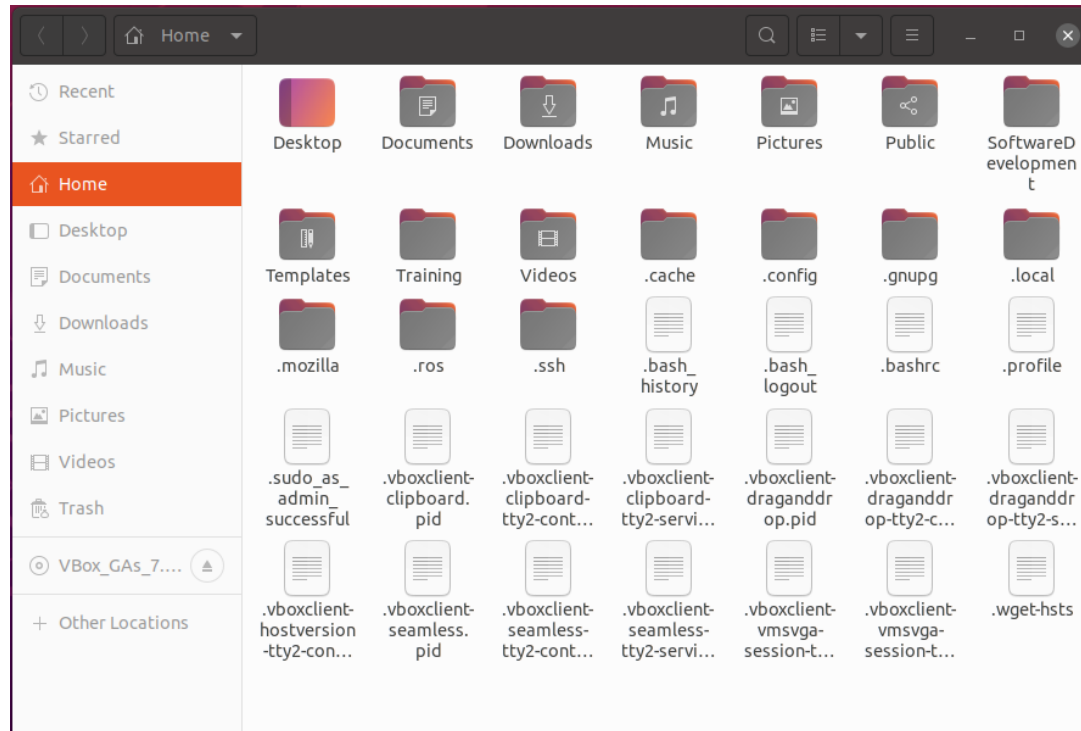
Why Use Linux?

- Most embedded processors run some form of Linux
 - RoboRIO, Jetson Nano, Raspberry Pi, etc.
- When robots are in arenas, you might not have access to the device
- Need to have the skills necessary to fix the issues



Command Line Interface (CLI)

- User interface that uses commands instead of graphic user interface navigated with a mouse



Useful Linux Commands

- `cd`
 - Used for changing the current working directory
 - Syntax
`cd folderToNavigateTo/subfolderToNavigateTo`
- `ls`
 - Used to display the contents of a folder
 - Syntax:
`ls`
Use `-a` to show hidden files
- `mkdir`
 - Used to create a new folder
 - Syntax
`mkdir newFolderName`



Useful Linux Commands

- touch
 - Used to create new files
 - Syntax:
`touch newFile.file_extension`
- vi
 - Used to open the Vim file editor
 - Syntax:
`vi fileToEdit.txt`
- nano
 - Used to open the nano file editor
 - Syntax:
`nano fileToEdit.txt`



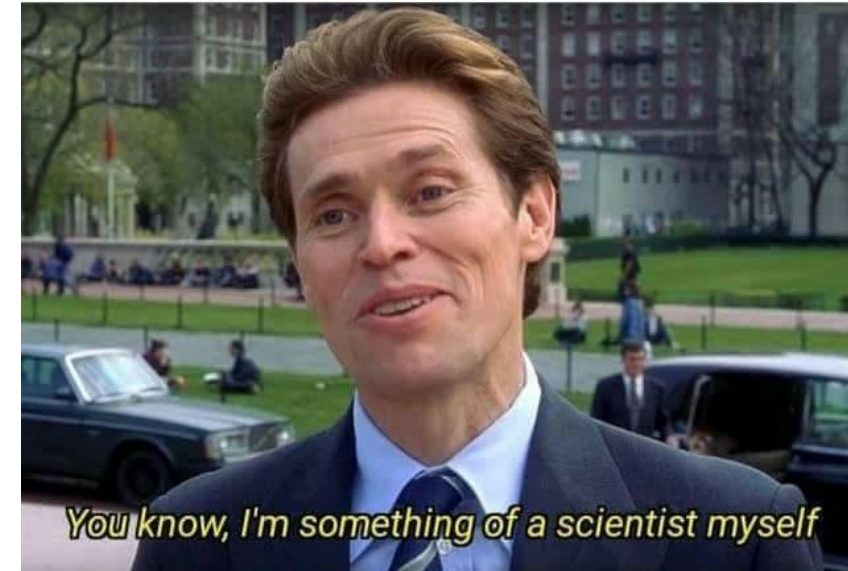
Useful Linux Commands

- **cat**
 - Used to view the contents of a file
 - Syntax:
cat fileToView.txt
Use the -n flag to view line numbers
- **rm**
 - Used to remove files and directories
 - Syntax:
rm fileToRemove.txt
rm -r DirectoryToRemove
Must use -r to remove directories



Useful Linux Commands

When you finally exit vim



WHEN YOU TRY TO EXIT VIM



I've been using Vim for about 2 years now, mostly because I can't figure out how to exit it.



Useful Linux Commands

- vi commands
 - To type commands in vi, press ESC to enter the command terminal
 - :q
 - Exits Vim
 - :w
 - Writes the changes to the file
 - :wq
 - Writes the changes, then exits Vim
 - :q!
 - Exits Vim and disregards any changes to the file
 - Move the cursor around using the arrow keys or hjkl
 - To insert text, press i. To stop entering text, press ESC

Useful Linux Commands

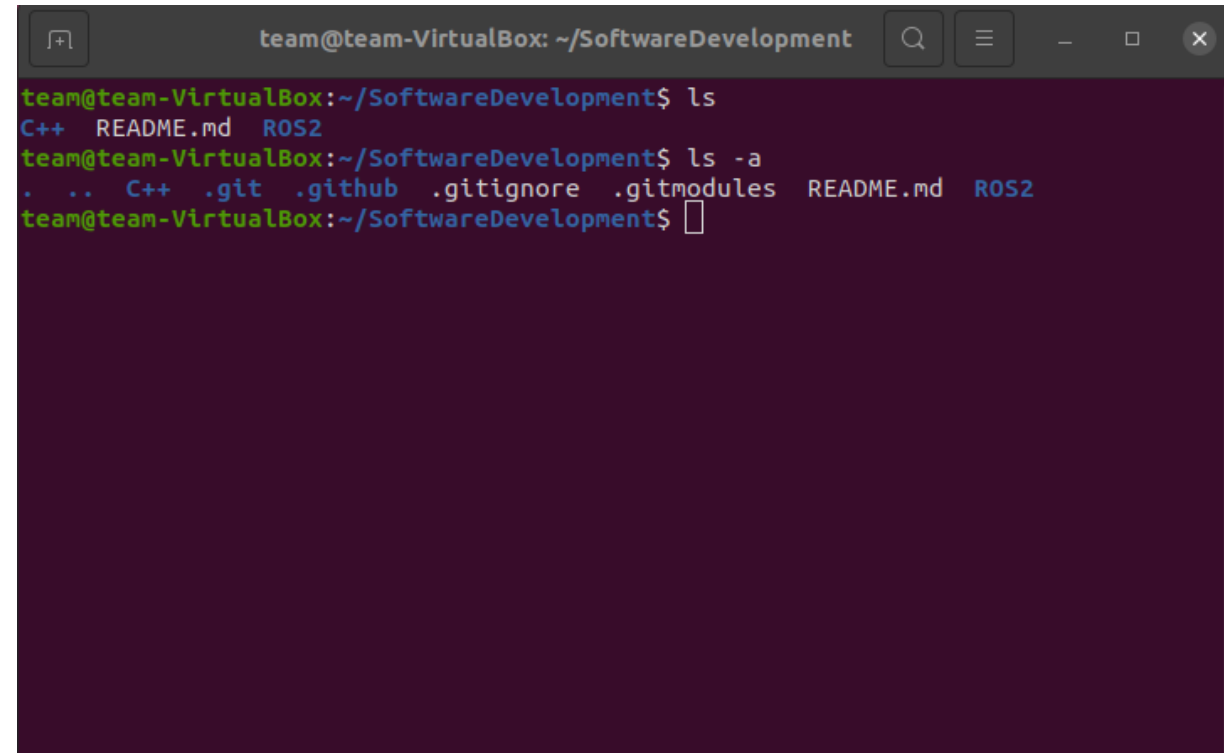
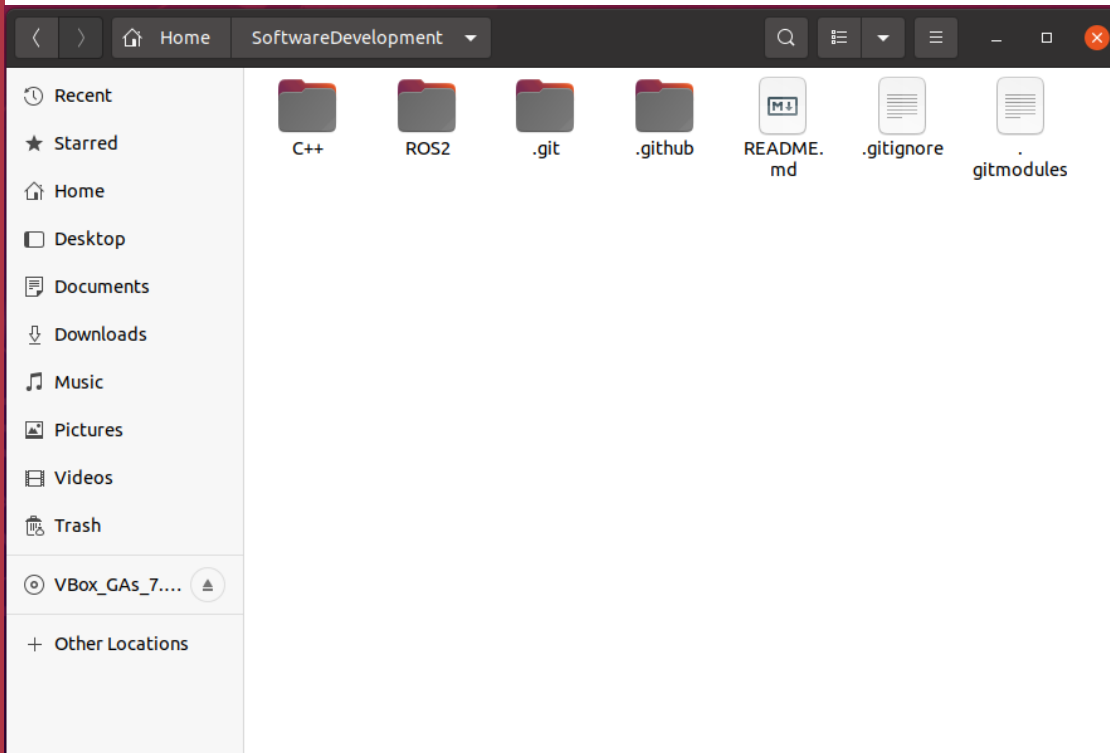
- nano commands
 - ^ (left control) O
 - Used to write the file to the specified output file
 - ^X
 - Close the editor
 - Move the cursor around using the arrow keys



Useful Linux Commands

In folder SoftwareDevelopment

Run ls and ls -a



Useful Linux Commands

In folder SoftwareDevelopment

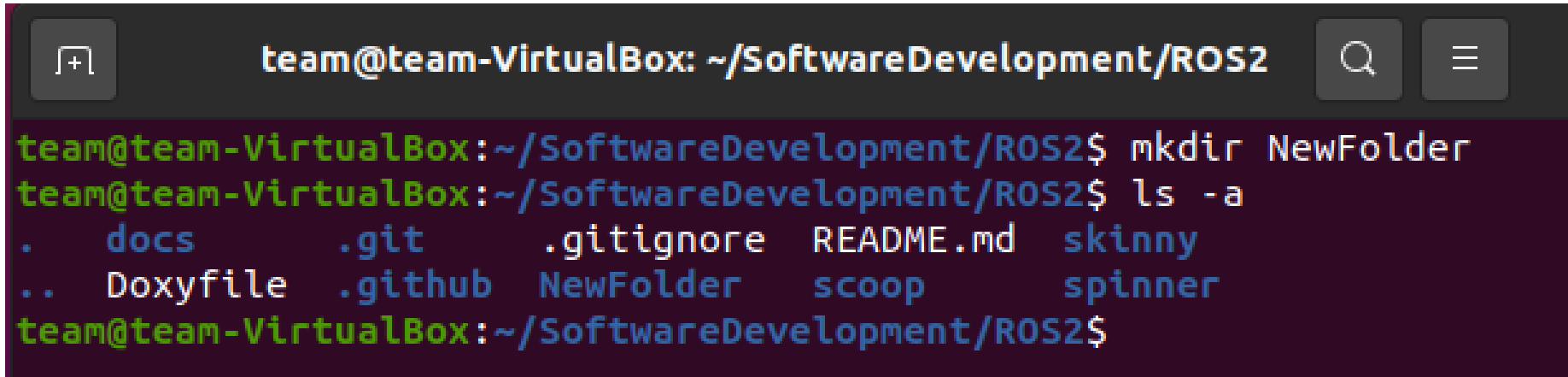
Run cd ROS2

```
team@team-VirtualBox: ~/SoftwareDevelopment/ROS2  
team@team-VirtualBox:~/SoftwareDevelopment$ cd ROS2  
team@team-VirtualBox:~/SoftwareDevelopment/ROS2$
```

Useful Linux Commands

In folder SoftwareDevelopment\ROS2

Run mkdir NewFolder



```
team@team-VirtualBox: ~/SoftwareDevelopment/ROS2
team@team-VirtualBox:~/SoftwareDevelopment/ROS2$ mkdir NewFolder
team@team-VirtualBox:~/SoftwareDevelopment/ROS2$ ls -a
.  docs      .git      .gitignore README.md  skinny
.. Doxyfile  .github   NewFolder scoop      spinner
team@team-VirtualBox:~/SoftwareDevelopment/ROS2$
```

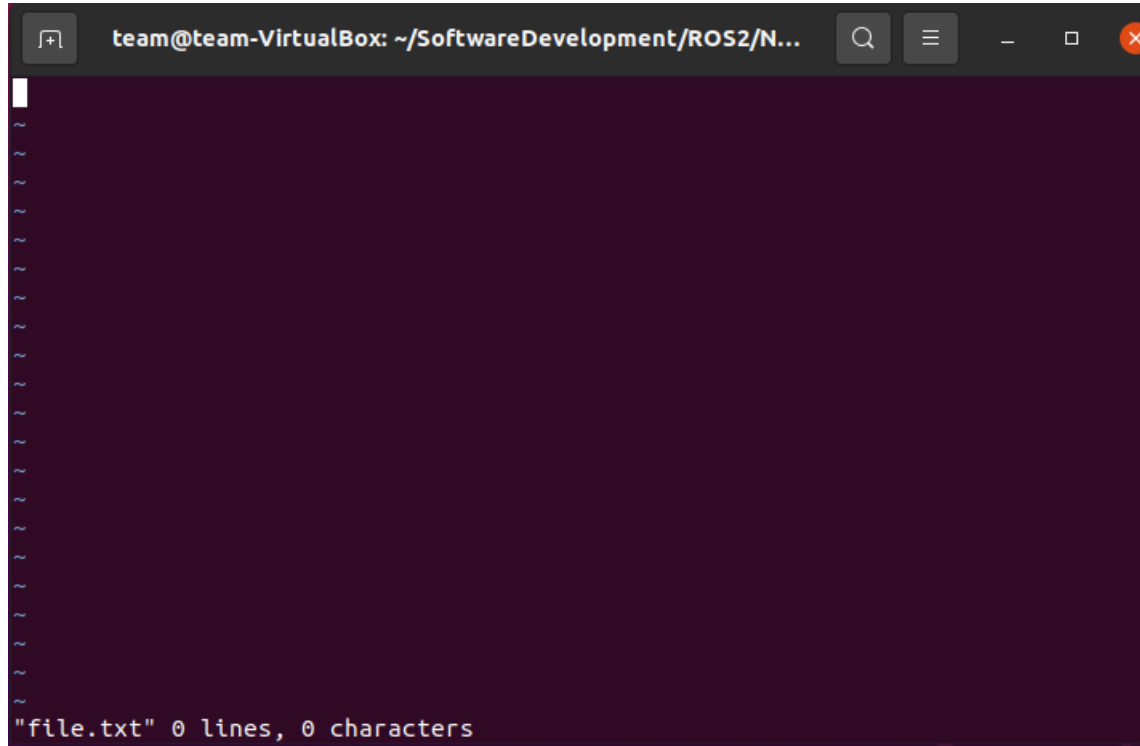
Useful Linux Commands

To create a new text file, run *touch file.txt*

```
team@team-VirtualBox: ~/SoftwareDevelopment/ROS2/N...  
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$ ls -a  
..  
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$ touch file.txt  
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$ ls  
file.txt  
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$
```

Useful Linux Commands

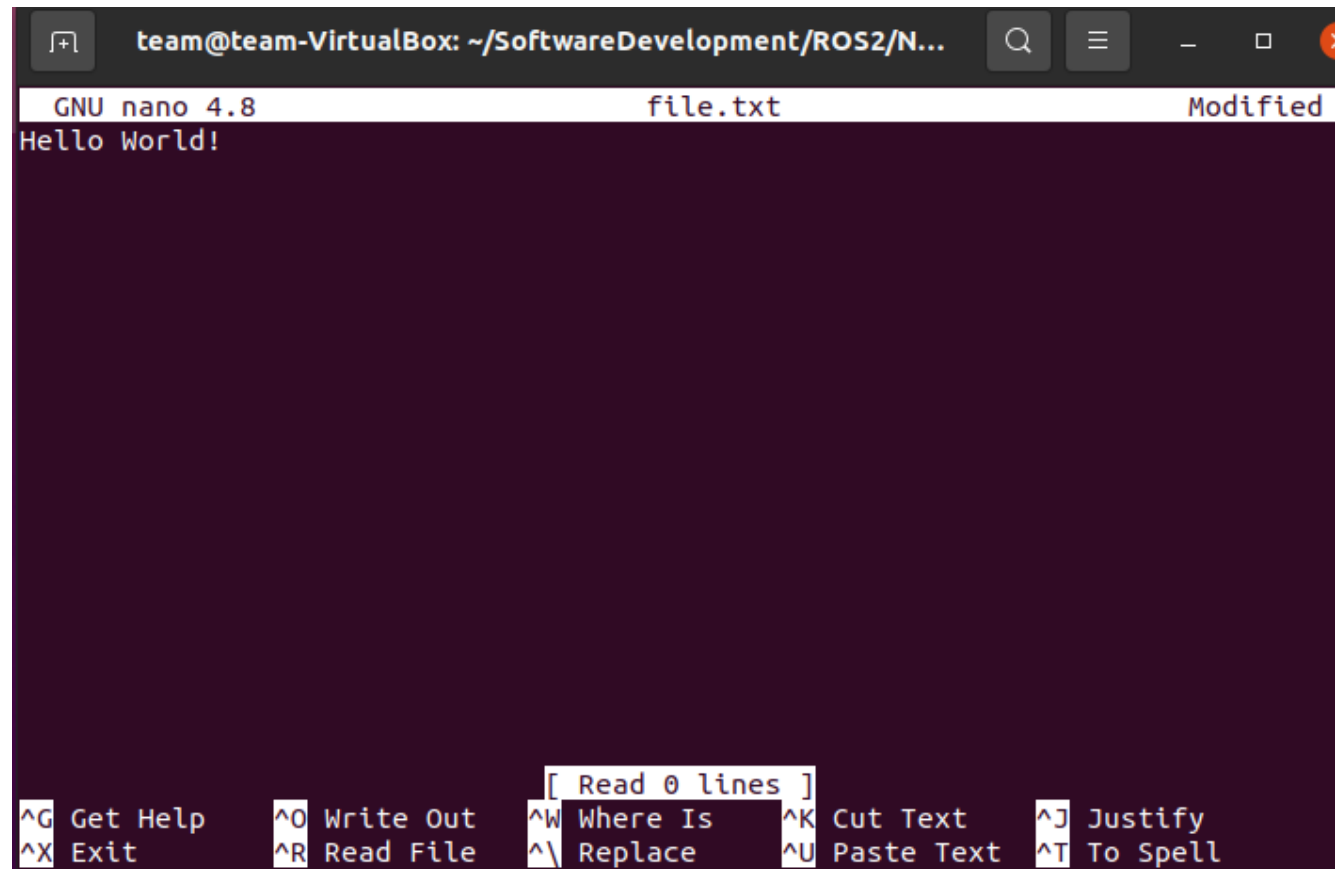
To open the text file, run *vi file.txt*



The screenshot shows a terminal window titled "team@team-VirtualBox: ~/SoftwareDevelopment/ROS2/N...". The terminal has a dark purple background. On the left side, there is a vertical column of tilde (~) characters. At the bottom of the terminal, the text "*file.txt*" 0 lines, 0 characters" is displayed, indicating that the vi editor is open to an empty file named file.txt.

Useful Linux Commands

To edit the file using nano, run *nano file.txt*



```
team@team-VirtualBox: ~/SoftwareDevelopment/ROS2/N...
GNU nano 4.8 file.txt Modified
Hello World!

[ Read 0 lines ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify
^X Exit      ^R Read File  ^_ Replace   ^U Paste Text ^T To Spell
```


Useful Linux Commands

To view the contents of a file, run *cat newFile.txt*

```
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$ nano file.txt
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$ cat file.txt
Hello World!
team@team-VirtualBox:~/SoftwareDevelopment/ROS2/NewFolder$
```

Navigate Through Linux Example

Open a terminal

Create a new folder named LinuxExample

Move into the LinuxExample folder

Create a new text file named TestFile.txt

Add your name to TestFile.txt using Vim

View the contents of TestFile.txt

Add Hello World to TestFile.txt using Nano

View the contents of TestFile.txt

Navigate to the parent directory

Remove LinuxExample



Navigate Through Linux Example

Open a terminal

Create a new folder named LinuxExample

```
mkdir LinuxExample
```

Move into the LinuxExample folder

```
cd LinuxExample
```

Create a new text file named TestFile.txt

```
touch TestFile.txt
```

Add your name to TestFile.txt using Vim

```
vi TestFile.txt
```

View the contents of TestFile.txt

```
cat TestFile.txt
```

Add Hello World to TestFile.txt using Nano

```
nano TestFile.txt
```

View the contents of TestFile.txt

```
cat TestFile.txt
```

Navigate to the parent directory

```
cd ..
```

Remove LinuxExample

```
rm -r LinuxExample
```

