DAILY ASSESSMENT

Date:	**26-5-2020**	**Name:**	**Kavyashree m**
Course:	**Digitall signal processing**	**USN:**	**4al15ec036**
Topic:	**Fourier series & ghibbs phenomena using python,fourier transform,fourier transform derivatives,fourier transform convolution,intuition of fourier,laplace transform of first order,implementation of laplace using MATLAB, applications of Z-transform,find the Z-transform of sequence using MATLAB**	**Semester & Section:**	**8th A**
Github Repository:	**Kavya**		

FORENOON SESSION DETAILS

Image of session

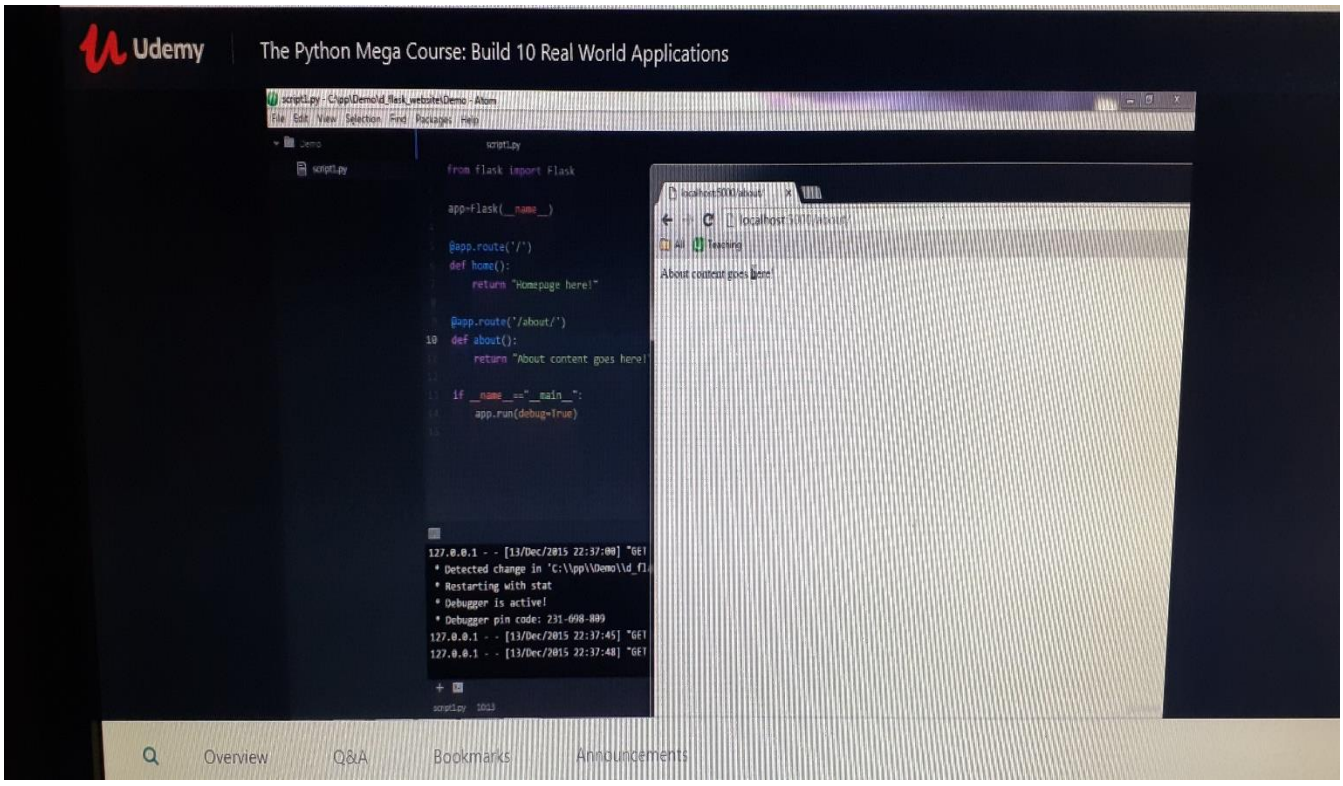


Fig 1 : fourier series

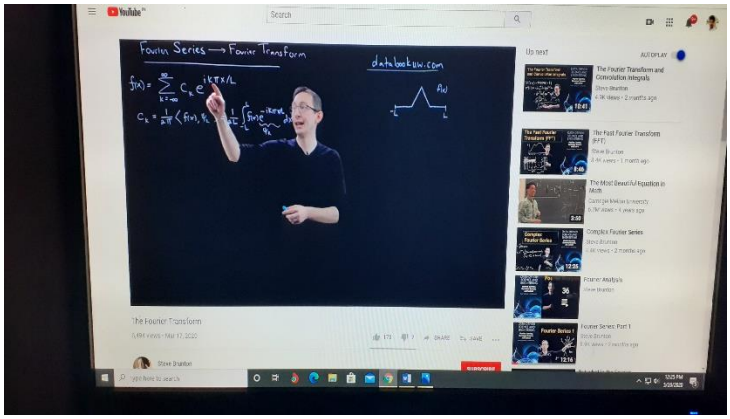


Fig 2 : fourier transform

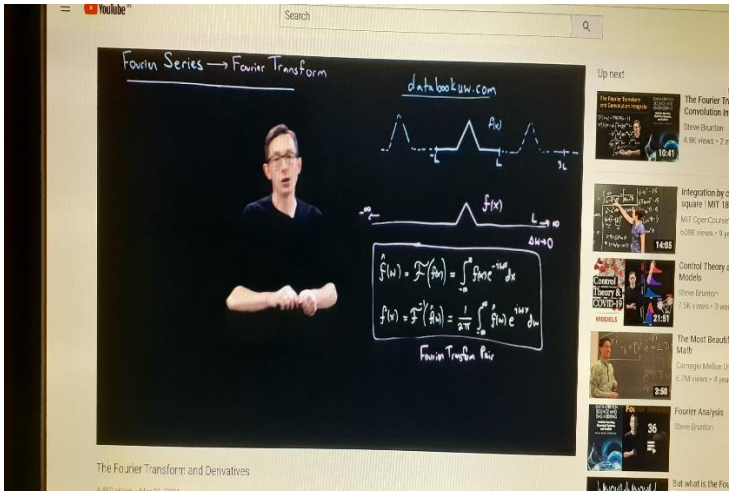


Fig 3: fourier transform derivative

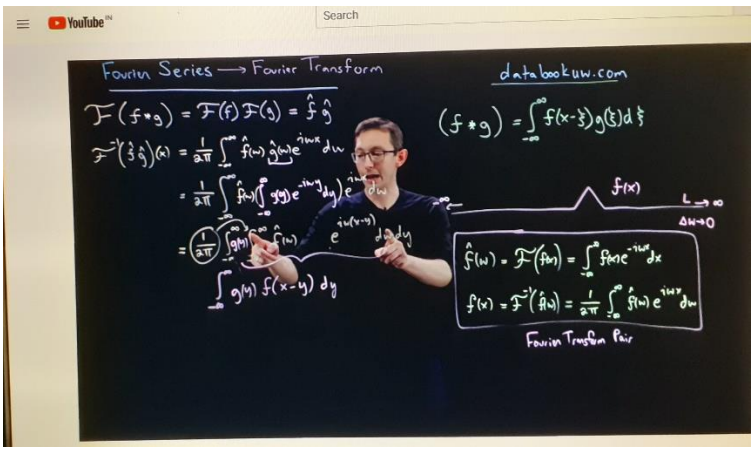


Fig 4: fourier transform convolution

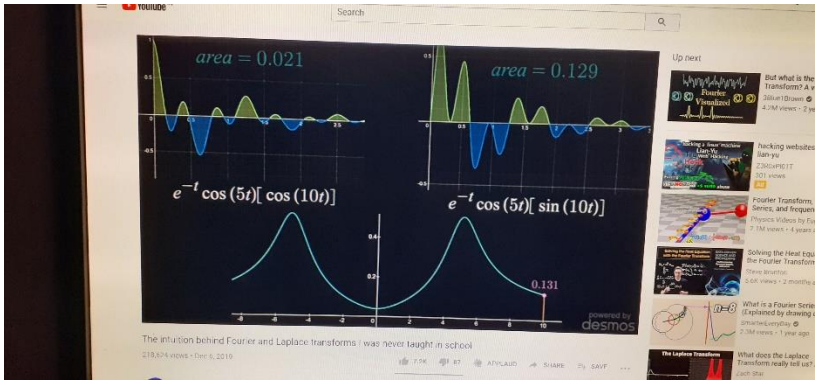


Fig 5: laplace transform of first order

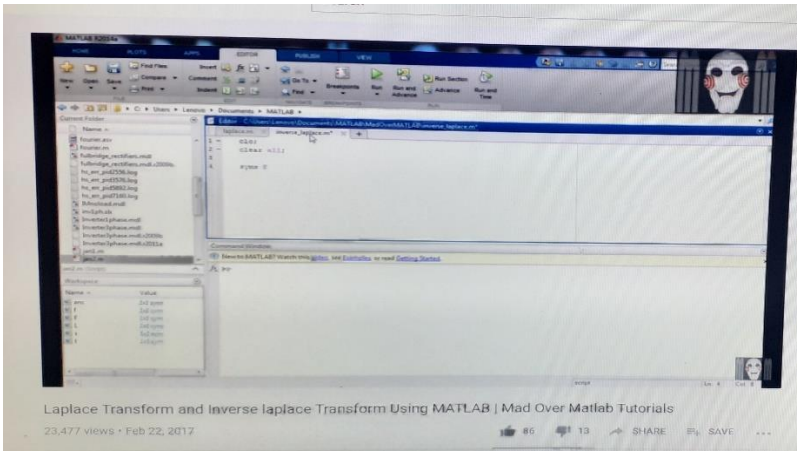


Fig 6: implementation of laplace using MATLAB

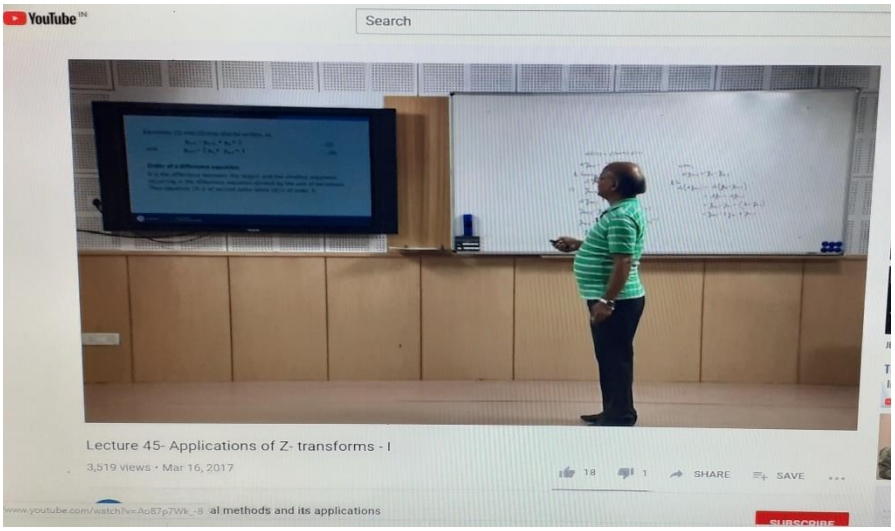


Fig 7: applications of Z-transform

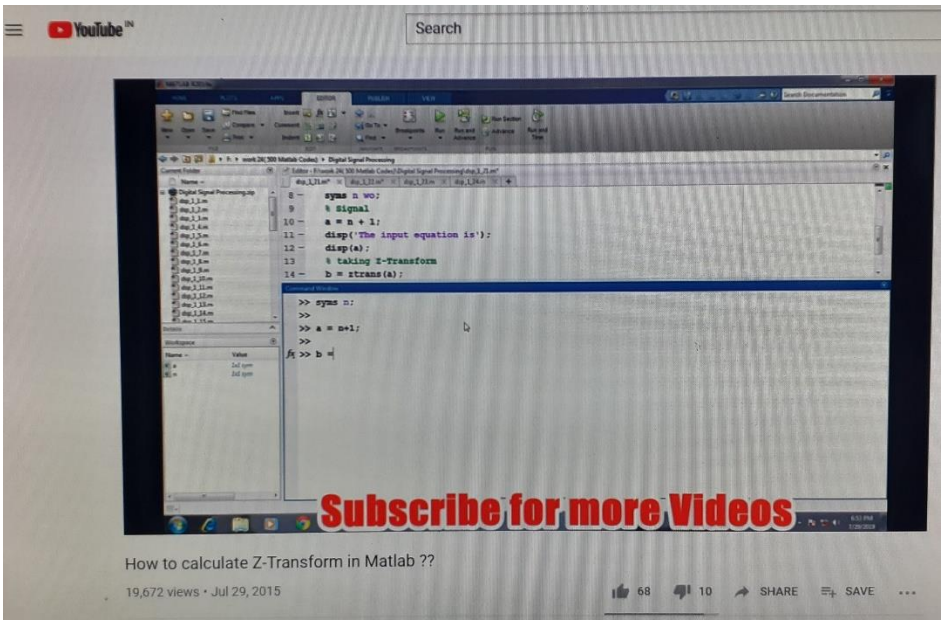


Fig 8: find the Z-transform of sequence using MATLAB

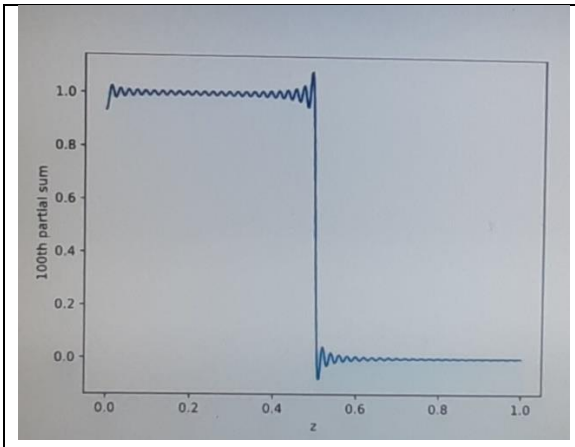
Fourier series & ghibbs phenomena using python

We take our function f(z) to be 1 on [0, 1/2] and 0 on (1/2, 1]. It works out that

$$c_n = \frac{1}{\lambda_n} \frac{J_1(\lambda_n/2)}{J_1(\lambda_n)^2}.$$

Python code and plot

Here's the plot with 100 terms. Notice how the partial sums overshoot the mark to the left of 1/2 and undershoot to the right of 1/2.



Here's the Python code that produced the plot.

```
import matplotlib.pyplot as plt
from scipy.special import j0, j1, jn_zeros
from scipy import linspace

N = 100 # number of terms in series

roots = jn_zeros(0, N)
coeff = [j1(r/2) / (r*j1(r)**2) for r in roots]
z = linspace(0, 1, 200)

def partial_sum(z):
    return sum( coeff[i]*j0(roots[i]*z) for i in range(N) )

plt.plot(z, partial_sum(z))
```

```
plt.xlabel("z")

plt.ylabel("{}th partial sum".format(N))

plt.show()
```

Fourier transform

The Fourier transform is used for the spectral analysis of time-series. For most functions *f* that occur in practice, *R* is a bounded even function of the time-lag τ and for typical noisy signals it turns out to be uniformly continuous with a maximum at $\tau = 0$.The autocorrelation function, more properly called the autocovariance function unless it is normalized in some appropriate fashion, measures the strength of the correlation between the values of *f* separated by a time lag. This is a way of searching for the correlation of *f* with its own past. It is useful even for other statistical tasks besides the analysis of signals. For example, if $f(t)$ represents the temperature at time *t*, one expects a strong correlation with the temperature at a time lag of 24 hours.

It possesses a Fourier transform,

$$P_f(\xi) = \int_{-\infty}^{\infty} R_f(\tau) e^{-2\pi i \xi \tau} \, d\tau.$$

This Fourier transform is called the power spectral density function of *f*

Fourier transform convolution

If f and g are functions defined at evenly spaced points, their convolution is given by:

26 (f ∗ g)[n] = f [m] m=−∞ ∞ ∑ g[n − m]

It turns out that convolving two functions is equivalent to multiplying them in the frequency domain – One multiplies the complex numbers representing coefficients at each frequency.

In other words, we can perform a convolution by taking the Fourier transform of both functions, multiplying the results, and then performing an inverse Fourier transform 32.

Laplace transform of first order

One familiar input to a first order system is the step change or step input. A step change from 0 to 1 is equivalent to a function that is equal to 0 for time < 0, and is equal to 1 for time [3] 0.

According to Kreyszig (2005)* "Solve the following initial value problem by Laplace transform:

$$y' + 4y = 0, \qquad y(0) = 2.8.$$

"

Solution

Here the given differential equation with initial condition is

$$y' + 4y = 0, \qquad y(0) = 2.8.$$

Now I have to solve this equation using Laplace transform.

So it will be

$$\mathcal{L}\{y' + 4y\} = \mathcal{L}\{0\}.$$

This means

$$(s\overline{y} - y_0) + 4\overline{y} = 0.$$

Now I already know from the given equation that $y_0 = y(0) = 2.8$.

Therefore I'll simplify this equation to get

$$\begin{aligned} s\overline{y} - 2.8 + 4\overline{y} &= 0 \\ \overline{y}(s+4) &= 2.8 \\ \overline{y} &= \frac{2.8}{s+4}. \end{aligned}$$

Next, I'll find out the value of y as

$$y = \mathcal{L}^{-1}\left\{\frac{2.8}{s+4}\right\}.$$

So I'll use one of the standard formulas in Laplace transform.

Thus it will be

$$\mathcal{L}^{-1}\left\{\frac{2.8}{s+4}\right\} = 2.8e^{-4t}.$$

Hence I can conclude that the solution of the differential equation will be

$$y = 2.8e^{-4t}.$$

This is the answer to this example.

Now I'll give you another example.

Implementation of laplace using MATLAB

Laplace transform

Syntax

- laplace(f)
- laplace(f,transVar)
- laplace(f,var,transVar)
-

Description

- example

laplace(f) returns the Laplace Transform of f. By default, the independent variable is t and the transformation variable is s.

- example

laplace(f,transVar) uses the transformation variable transVar instead of s.

- example

laplace(f,var,transVar) uses the independent variable var and the transformation variable transVar instead of t and s, respectively.

Examples

Laplace Transform of Symbolic Expression

Compute the Laplace transform of 1/sqrt(x). By default, the transform is in terms of s.

```
syms x y
f = 1/sqrt(x);
laplace(f)
ans =
pi^(1/2)/s^(1/2)
```

Specify Independent Variable and Transformation Variable

Compute the Laplace transform of exp(-a*t). By default, the independent variable is t, and the transformation variable is s.

```
syms a t
f = exp(-a*t);
laplace(f)
ans =
1/(a + s)
```

Specify the transformation variable as y. If you specify only one variable, that variable is the transformation variable. The independent variable is still t.

```
laplace(f,y)
ans =
1/(a + y)
```

Specify both the independent and transformation variables as a and y in the second and third arguments, respectively.

laplace(f,a,y)

ans =

1/(t + y)

Applications of Z-transform

It is generalize form of Fourier transform, which we get when we generalize Fourier transform and get z transform. Applications of Z Ttransform is used to convert discrete time domain into a complex frequency domain where, discrete time domain represents an order of complex or real numbers.

Find the Z-transform of sequence using MATLAB

Program Code :

```
%ztransform of finite duration sequence
clc;
close all;
clear all;
syms 'z';
disp('If you input a finite duration sequence x(n), we will give you its z-transform');
nf=input('Please input the initial value of n = ');
nl=input('Please input the final value of n = ');
x= input('Please input the sequence x(n)= ');
syms 'm';
syms 'y';
f(y,m)=(y*(z^(-m)));
disp('Z-transform of the input sequence is displayed below');
k=1;
for n=nf:1:nl
```

```
    answer(k)=(f((x(k)),n));
   k=k+1;
end
disp(sum(answer));
```

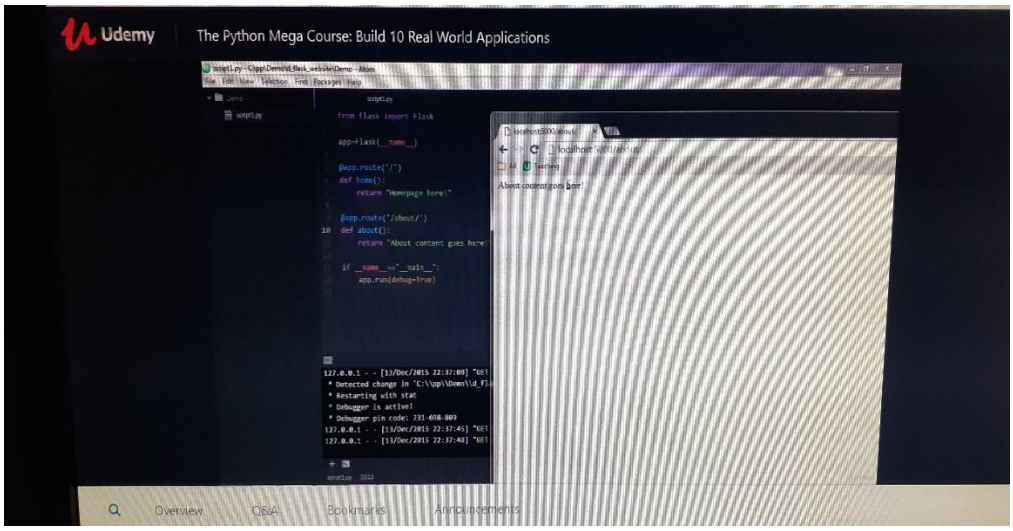
Example of Output

```
If you input a finite duration sequence x(n), we will give you its z-transform
Please input the initial value of n = 0
Please input the final value of n = 4
Please input the sequence x(n)= [1 0 3 -1 2]
Z-transform of the input sequence is displayed below
3/z^2 - 1/z^3 + 2/z^4
```

AFTERNOON SESSION DETAILS

Date:	**26-5-2020**	**Name:**	**Kavyashree m**
Course:	**Python programming**	**USN:**	**4al15ec036**
Topic:	**Application :build a personal website with python and flask**	**Semester & Section:**	**8th A**
Github Repository:	**Kavya**		

Image of session



Build a personal website with python

HTML

- HTML stands for Hyper Text Markup Language
- HTML describes the structure of a Web page

- HTML consists of a series of elements
- HTML elements tell the browser how to display the content
- HTML elements are represented by tags
- HTML tags label pieces of content such as "heading", "paragraph", "table", and so on
- Browsers do not display the HTML tags, but use them to render the content of the page

HTML Tags

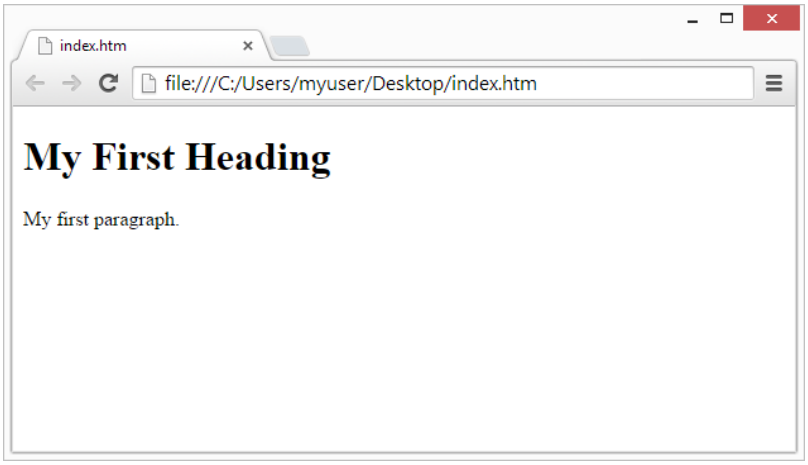
- HTML tags are element names surrounded by angle brackets:

  <tagname>content goes here...</tagname>
- HTML tags normally come in pairs like and
- The first tag in a pair is the start tag, the second tag is the end tag
- The end tag is written like the start tag, but with a forward slash inserted before the tag nam

Web Browsers

The purpose of a web is to read HTML documents and display them.

The browser does not display the HTML tags, but uses them to determine how to display the document:



HTML Page Structure

Below is a visualization of an HTML page structure:

<html>

<head>

<title>Page title</title>

</head>

<body>

<h1>This is a heading</h1>

This is a paragraph.

This is another paragraph.

</body>

</html>

HTML Template

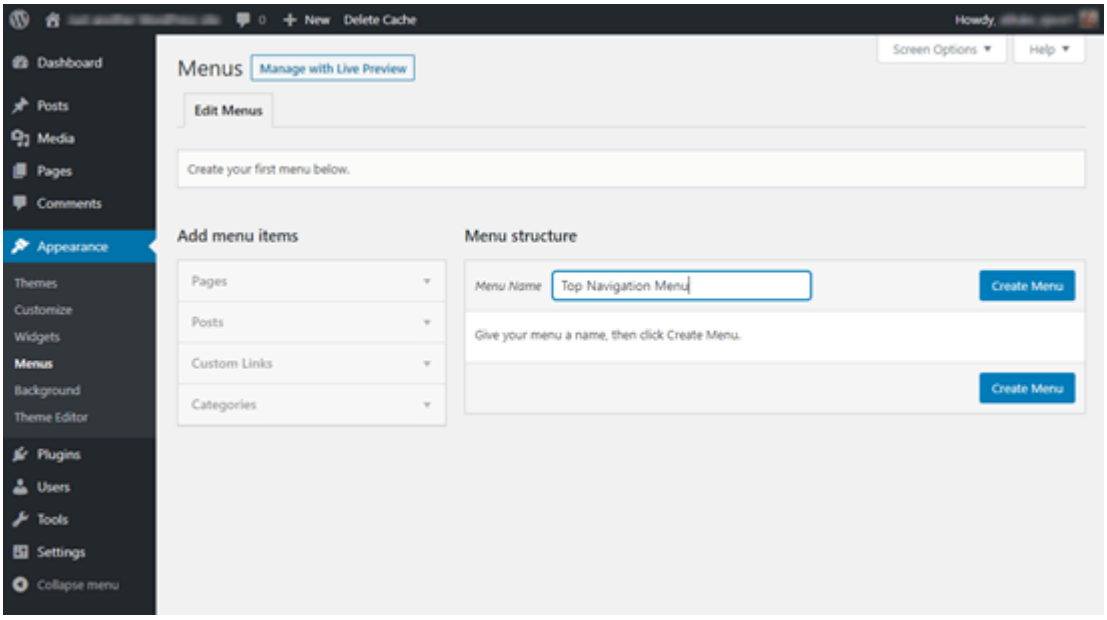
An example of HTML template is as shown below :

Navigation Menu

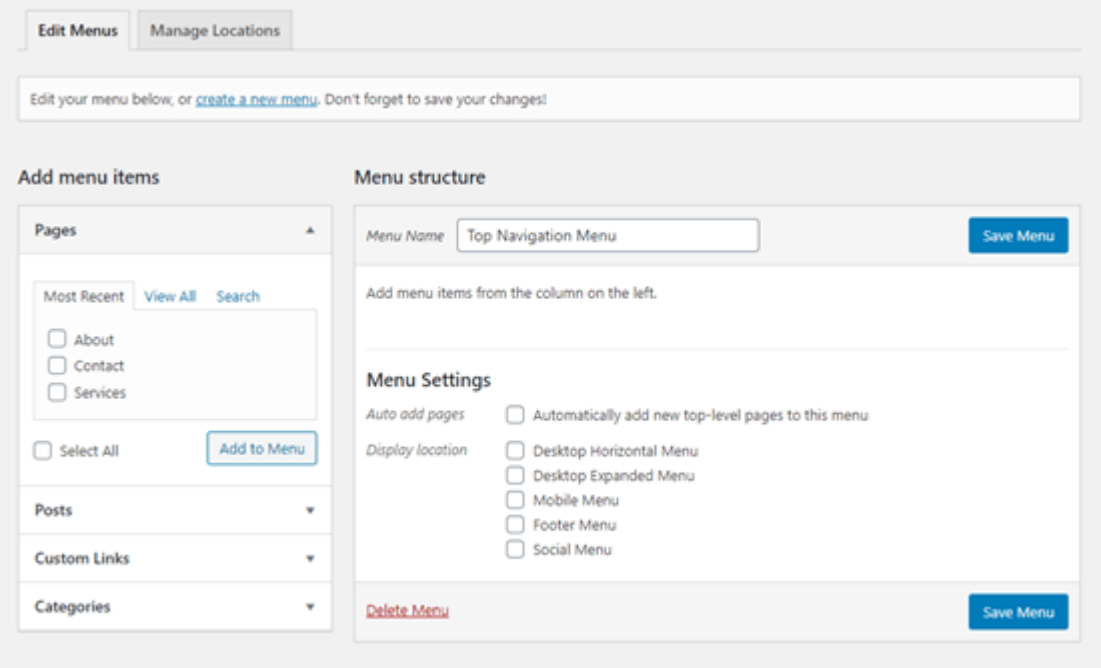
A navigation menu is a list of a links pointing to important areas of a website. They are usually presented as a horizontal bar of links at the top of every page on a website.Navigation menus give your site structure and help visitors find what they're looking for. WordPress makes it really easy to add menus and sub-menus. You can add links to your most important pages, categories or topics, blog posts, and even custom links such as your social media profile.The exact location of your menu will depend on your WordPress theme. Most themes will have several options, so you can create different menus that can be displayed in different places.

Creating Your First Custom Navigation Menu

To create a navigation menu, you need to visit the Appearance » Menus page in your WordPress admin dashboard.

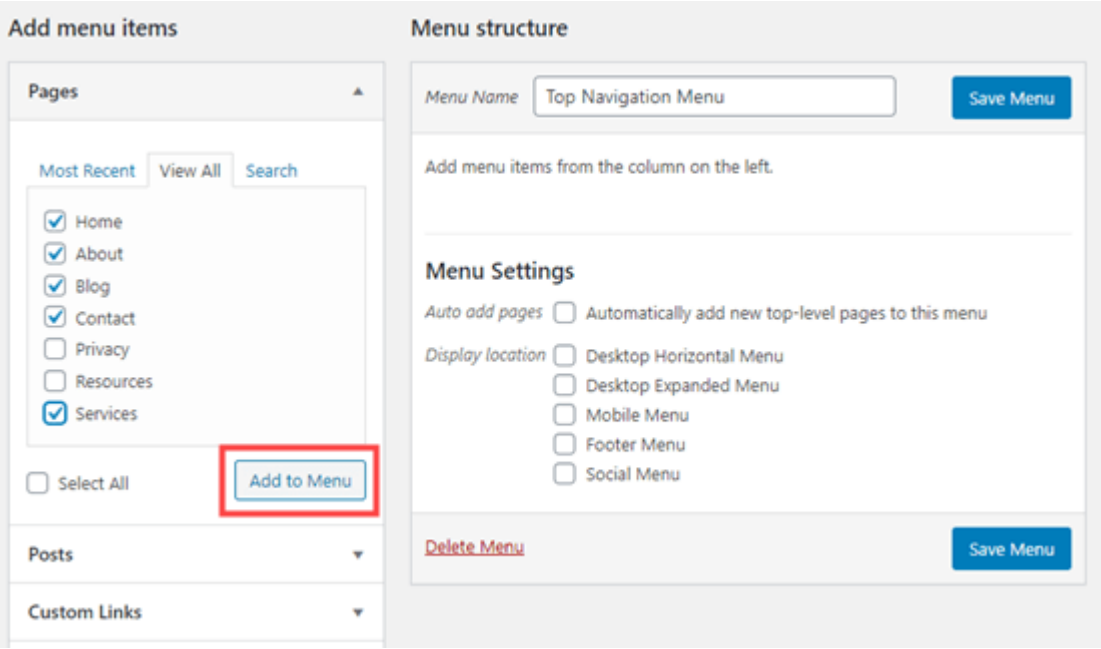


First, you need to provide a name for your menu, like 'Top Navigation Menu' and then click the 'Create Menu' button. This will expand the menu area, and it will look like this:

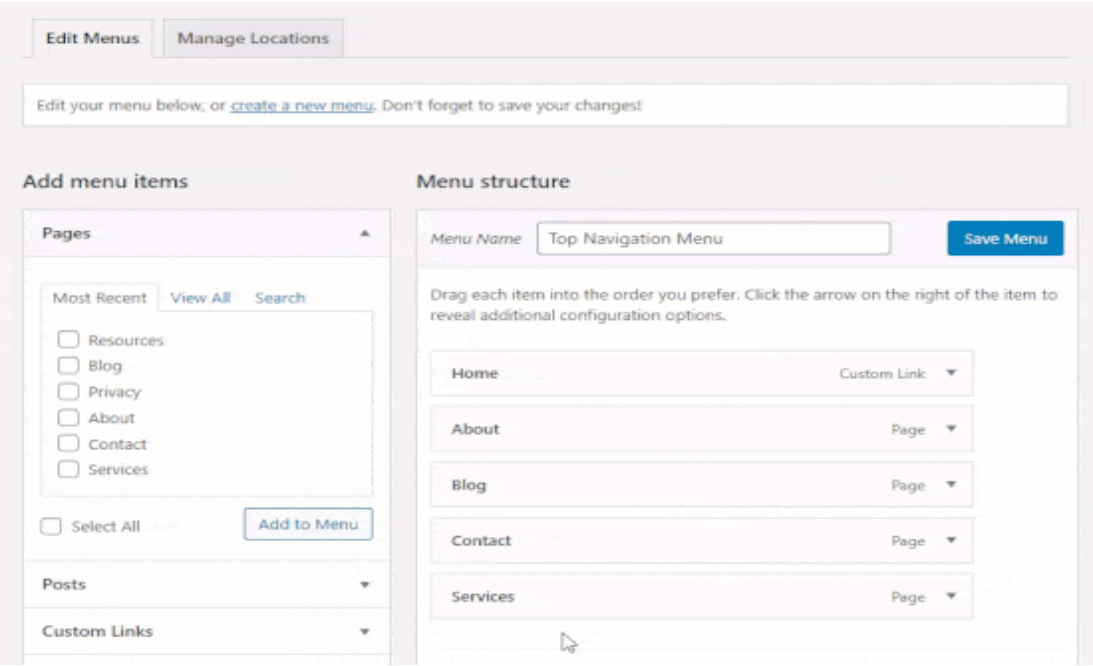


Next, you can choose the pages you want to add to the menu. You can either automatically add all new top-level pages, or you can select specific pages from the left column.

First, click the 'View All' tab to see all your site's pages. After that click the box next to each of the pages you want to add to your menu, and then click on the 'Add to Menu' button.

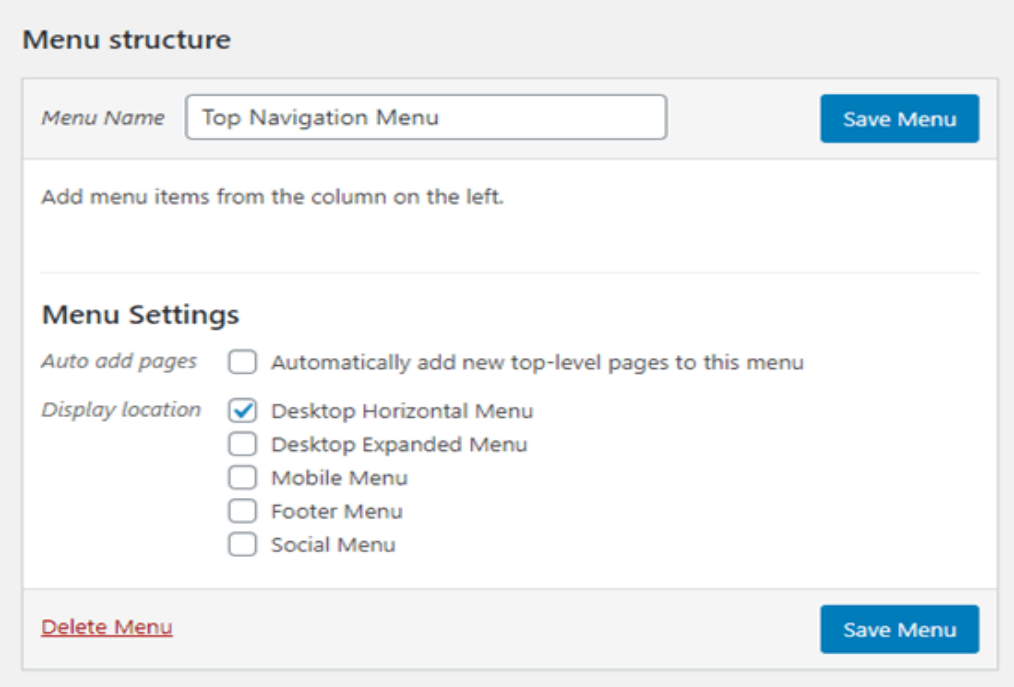


Once your pages have been added, you can move them around by dragging and dropping them**.**



Most themes have several different locations where you can put menus. In this example, we're using the default 2020 theme, which has 5 different locations.

After adding pages to the menu, select the location where you want to display the menu and click on the 'Save Menu' button.



CSS Styling

- CSS stands for Cascading Style Sheets
- CSS describes how HTML elements are to be displayed on screen, paper, or in other media
- CSS saves a lot of work. It can control the layout of multiple web pages all at once
- External stylesheets are stored in CSS files

CSS selector

- The selector points to the HTML element you want to style.
- The declaration block contains one or more declarations separated by semicolons.
- Each declaration includes a CSS property name and a value, separated by a colon.

- Multiple CSS declarations are separated with semicolons, and declaration blocks are surrounded by curly braces.

Creating a python virtual environment

A virtual environment is a Python environment such that the Python interpreter, libraries and scripts installed into it are isolated from those installed in other virtual environments, and any libraries installed in a “system” Python, i.e., one which is installed as part of your operating system.

A virtual environment is a directory tree which contains Python executable files and other files which indicate that it is a virtual environment.

Common installation tools such as setuptools and pip work as expected with virtual environments. In other words, when a virtual environment is active, they install Python packages into the virtual environment without needing to be told to do so explicitly.

When a virtual environment is active, the attributes sys.prefix and sys.exec_prefix point to the base directory of the virtual environment, whereas sys.base_prefix and sys.base_exec_prefix point to the non-virtual environment Python installation which was used to create the virtual environment.

When a virtual environment is active, any options that change the installation path will be ignored from all distutils configuration files to prevent projects being inadvertently installed outside of the virtual environment.

How to install GIT

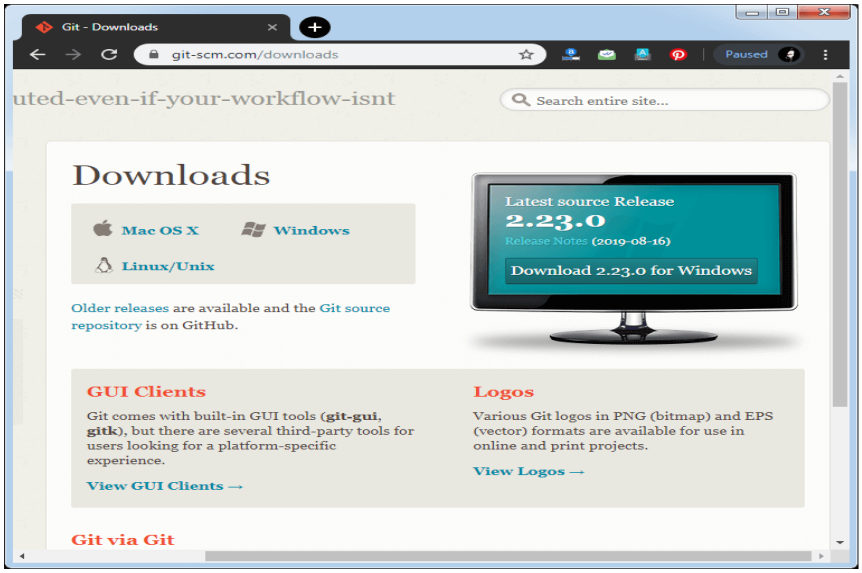
To use Git, you have to install it on your computer. Even if you have already installed Git, it's probably a good idea to upgrade it to the latest version. You can either install it as a package or via another installer or download it from its official site.

Now the question arises that how to download the Git installer package. Below is the stepwise installation process that helps you to download and install the Git.

How to download Git?

Step1

To download the Git installer, visit the Git's official site and go to download page. The page looks like as



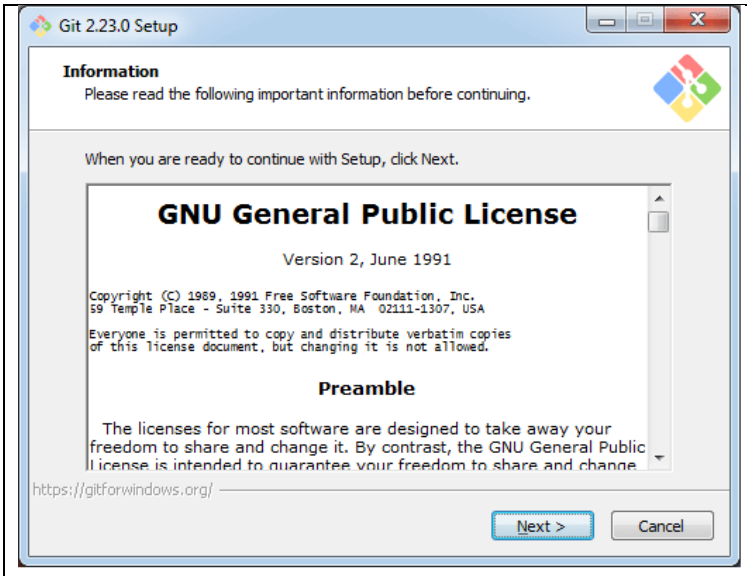
Click on the package given on the page as download 2.23.0 for windows. The download will start after selecting the package.

Now, the Git installer package has been downloaded.

Install Git

Step2

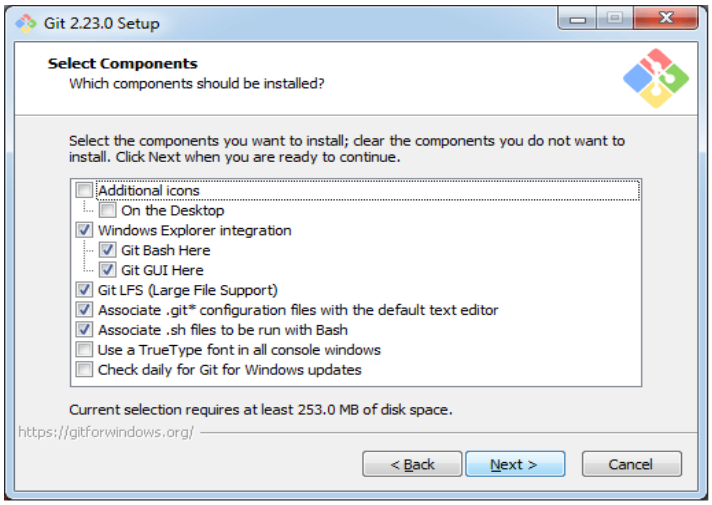
Click on the downloaded installer file and select yes to continue. After the selecting yes the installation begins, and the screen will look like as



Click on next to continue.

Step3

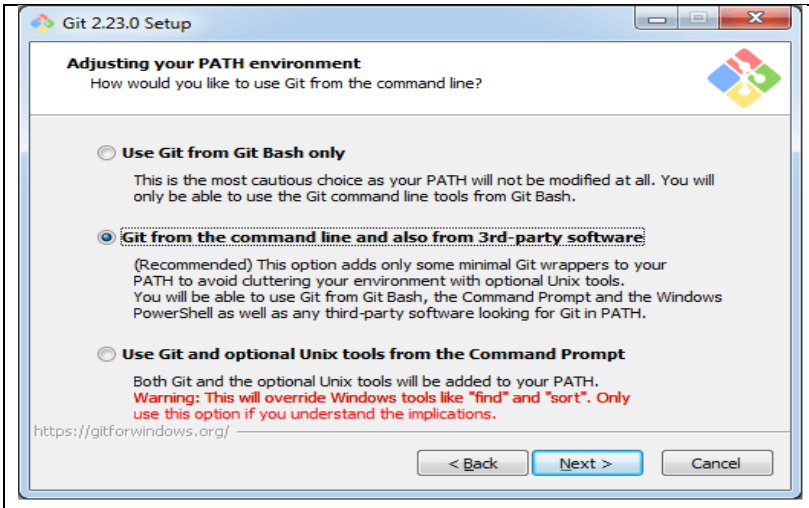
Default components are automatically selected in this step. You can also choose your required part**.**



Click next to continue.

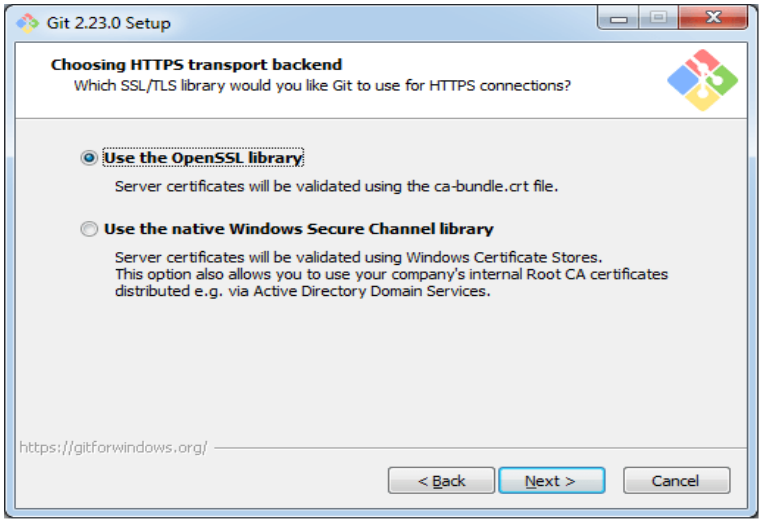
Step4

The default Git command-line options are selected automatically. You can choose your preferred choice. Click next to continue**.**



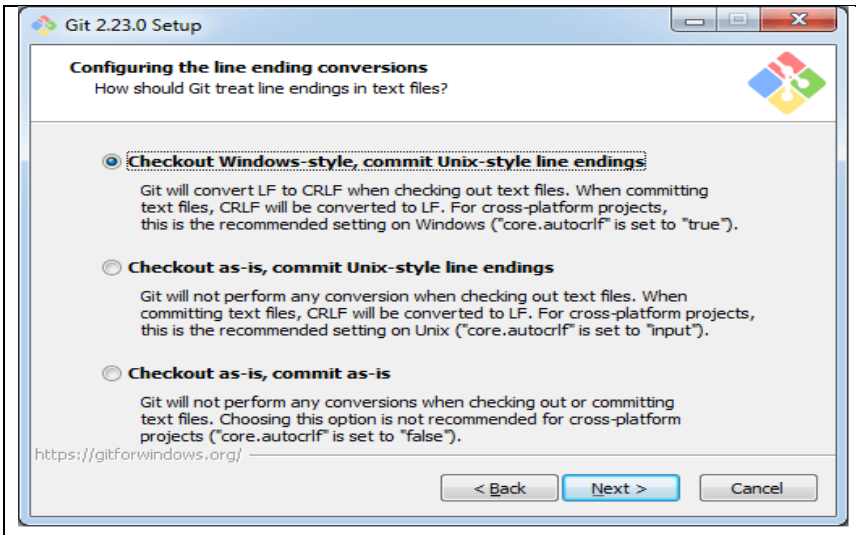
Step5

The default transport backend options are selected in this step. Click next to continue.



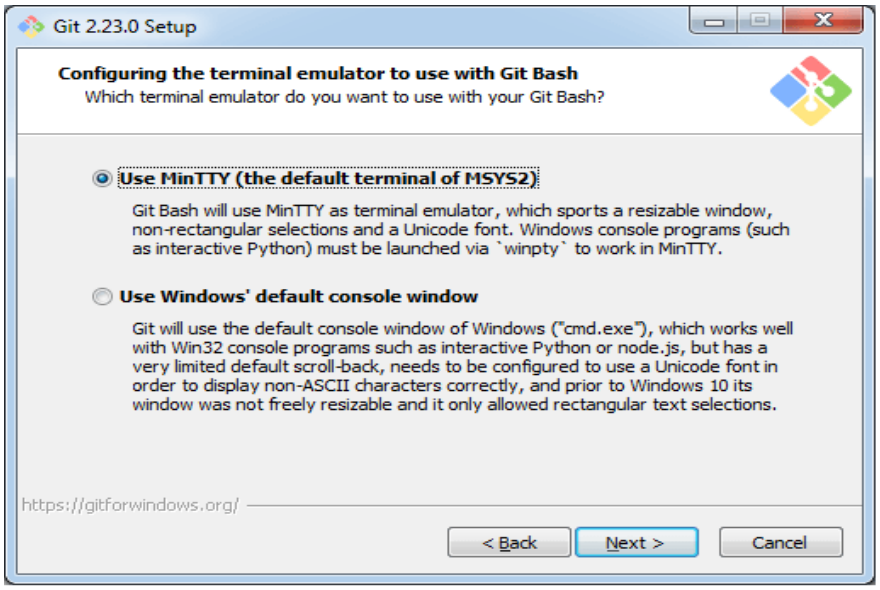
Step6

Select your required line ending option and click next to continue.



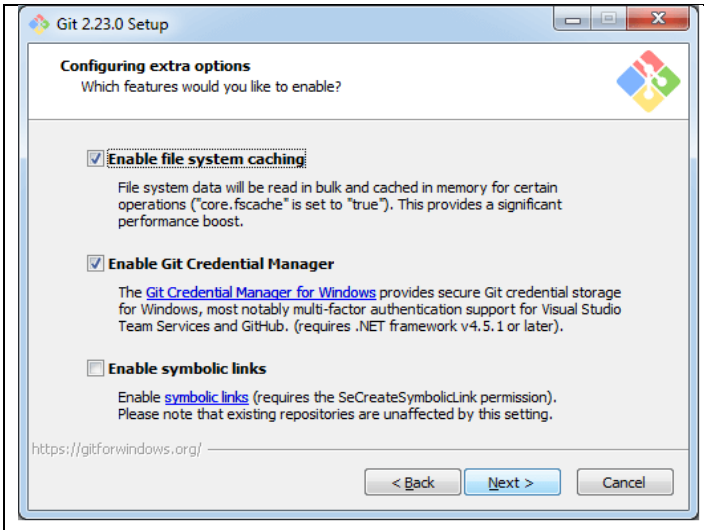
Step7

Select preferred terminal emulator clicks on the next to continue.



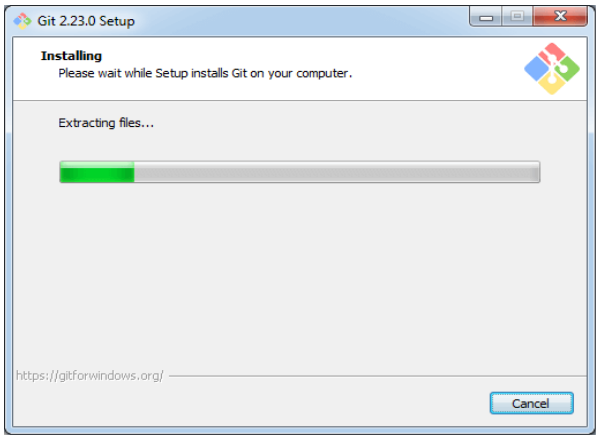
Step8

This is the last step that provides some extra features like system caching, credential management and symbolic link. Select the required features and click on the next option.



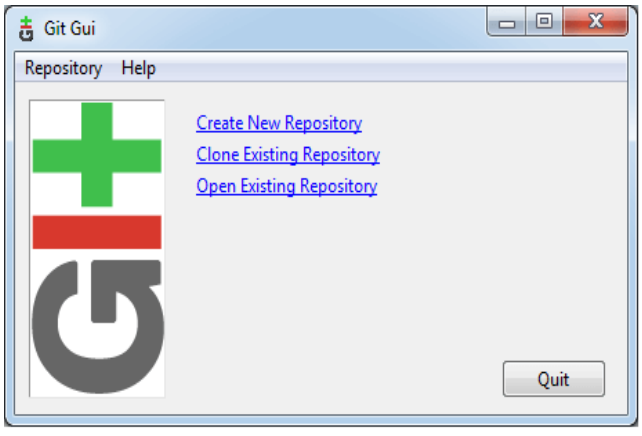
Step9

The files are being extracted in this step.



Therefore, The Git installation is completed. Now you can access the Git Gui and Git Bash.

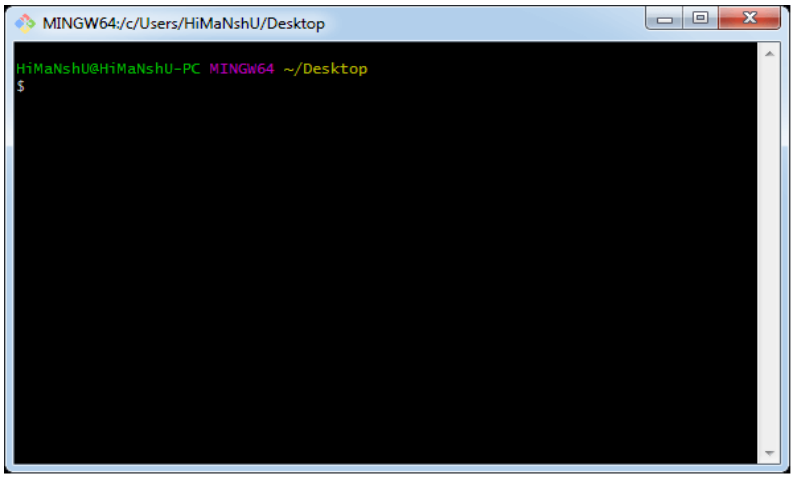
The Git Gui looks like as



It facilitates with three features.

- Create New Repository
- Clone Existing Repository
- Open Existing Repository

The Git Bash looks like as



TROUBLESHOOTING

When learning how to code in Python, most Ignition users tend to place most of their learning efforts on memorizing syntax or other aspects of the language. While being comfortable with the language is useful, there are plenty of references available: countless books and websites that describe syntax and usage already exist.

The following are some general and helpful best practices that can help minimize the amount of time you spend troubleshooting, as they can help better direct you to a problem.

- Look for Errors
- Use Print Statements
- Avoid Hard-Coding Arguments: Use Variables Instead
- The Simplest Approach Really Is the Best Approach