

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,
SONEPAT

APPLICATION PROGRAMMING LAB WORK

NAME : YASH JAIN
ROLL NO. : 11911029
BRANCH : CSE

1. Create a HTML web page form.

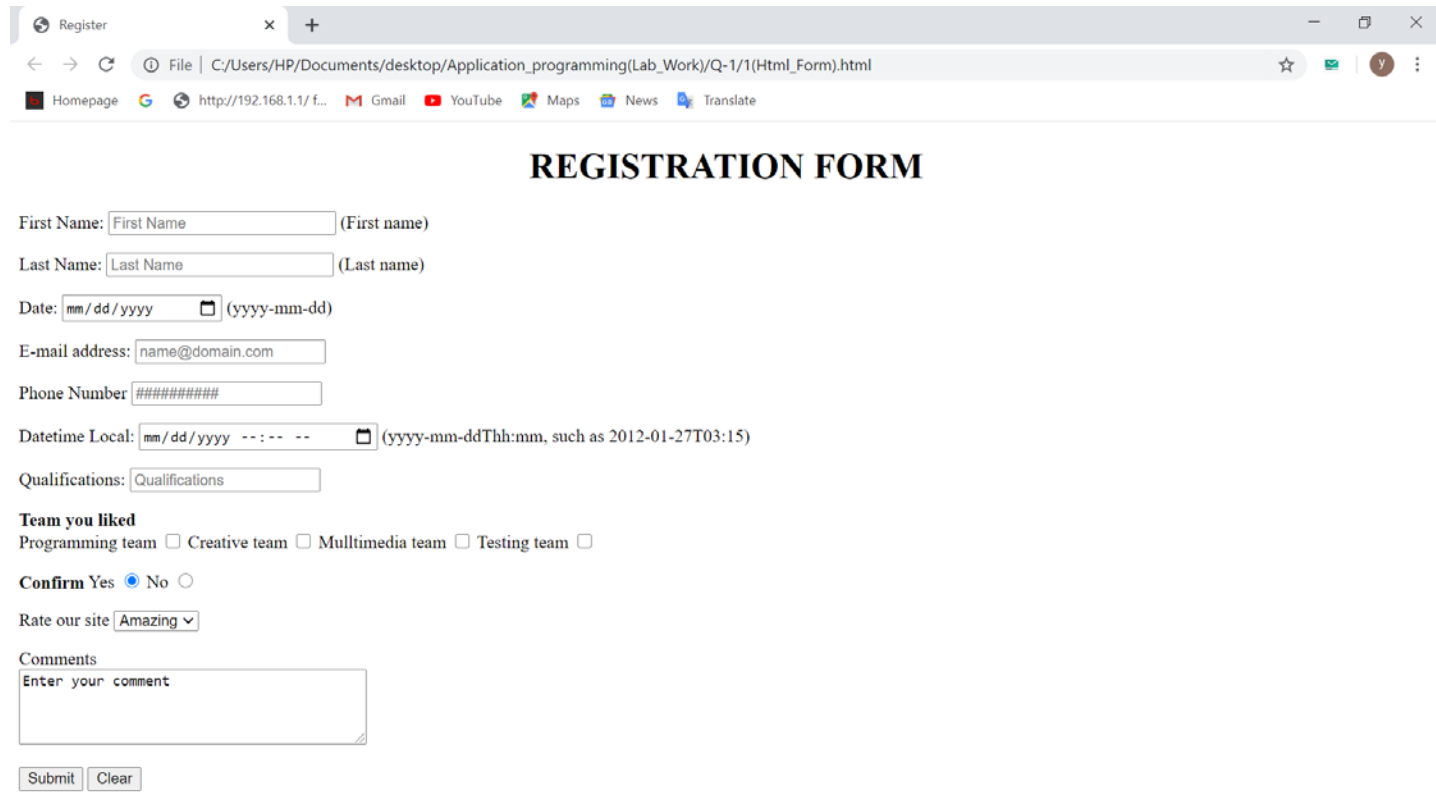
CODE

The image shows a web browser window displaying the HTML source code of a file named '1(Html_Form).html'. The browser's address bar shows the file path: C:\Users\HPA\Documents\desktop\Application_programming(Lab_Work)\Q-1-1(Html_Form).html. The status bar at the bottom indicates the file is 111:1 and provides various utility icons. The HTML code is displayed in a dark-themed editor with syntax highlighting. The code defines a form with the following elements:

- A text input field for 'name' with a placeholder 'Enter your name'.
- A text input field for 'email' with a placeholder 'Enter your email'.
- A password input field for 'password' with a placeholder 'Enter your password'.
- A confirmation checkbox labeled 'Confirm your password'.
- A 'Submit' button.

The code also includes various form attributes like 'type', 'name', 'value', and 'placeholder'.

OUTPUT



The screenshot shows a web browser window with a single tab titled "Register". The address bar displays the file path: "C:/Users/HP/Documents/desktop/Application_programming(Lab_Work)/Q-1/1(Html_Form).html". Below the browser window, the registration form is displayed. It includes fields for First Name, Last Name, Date, E-mail address, Phone Number, Datetime Local, and Qualifications. There are also checkboxes for "Team you liked" (Programming team, Creative team, Multimedia team, Testing team), a "Confirm" section with "Yes" and "No" radio buttons, a "Rate our site" dropdown menu set to "Amazing", and a "Comments" text area. At the bottom, there are "Submit" and "Clear" buttons.

Register

File | C:/Users/HP/Documents/desktop/Application_programming(Lab_Work)/Q-1/1(Html_Form).html

Homepage G http://192.168.1.1/ f... Gmail YouTube Maps News Translate

REGISTRATION FORM

First Name: (First name)

Last Name: (Last name)

Date: (yyyy-mm-dd)

E-mail address:

Phone Number:

Datetime Local: (yyyy-mm-ddThh:mm, such as 2012-01-27T03:15)

Qualifications:

Team you liked

Programming team ☐ Creative team ☐ Multimedia team ☐ Testing team ☐

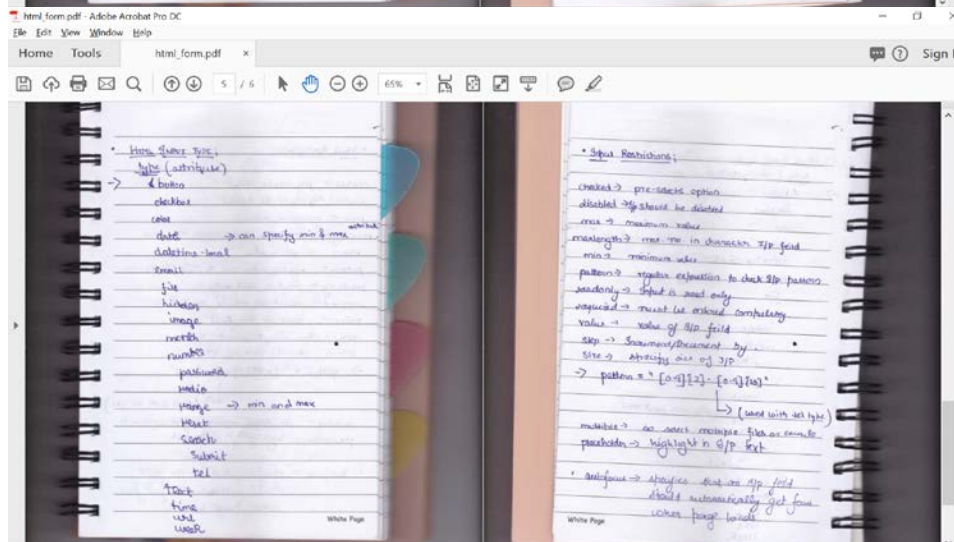
Confirm Yes ☒ No ☐

Rate our site:

Comments

Enter your comment

NOTES:



2. Home page using HTML.

CODE:

[illegible]

OUTPUT

Register

2(Html_homepage).html

+

File | C:/Users/HP/Documents/desktop/Application_programming(Lab_Work)/Q-2/2(Html_homepage).html

Search Star Mail

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DAILY BLOG

MARCH 28 2020

Linear harmonic oscillator

In a classical mechanics, a linear harmonic oscillator is a system that, when displaced from its equilibrium position, experiences a restoring force F proportional to the displacement x , where k is a positive constant. If F is the only force acting on the system, the system is called a simple linear harmonic oscillator, and it undergoes simple harmonic motion. Sinusoidal oscillations about the equilibrium point, with a constant amplitude and a constant frequency (which does not depend on the amplitude). If a frictional force (damping) proportional to the velocity is also present the harmonic oscillator is described as a damped oscillator.

Depending on the friction coefficient, the system can :

(1) Oscillate with a frequency lower than in the undamped case, and an amplitude decreasing with time (underdamped oscillator).

(2) Decay to the equilibrium position, without oscillations (overdamped oscillator).

The bounded or the boundary solution between an underdamped oscillator and an overdamped oscillator occurs at a particular value of the friction coefficient and is called the critically damped. If an external time-dependent force is present, the linear harmonic oscillator is described as a driven oscillator. Mechanical examples include pendulums (with small angles of displacement), masses connected to springs and acoustical systems. Other analogous systems include electrical harmonic oscillators such as RLC circuits. The harmonic oscillator model is very important in Physics, because any mass subject to a force in stable equilibrium acts as a linear harmonic oscillator for small variations. Harmonic oscillation occurs widely in nature and are exploited in many manmade devices, such as clocks and radio circuits. They are the source of virtually all sinusoidal vibrations and waves.

MARCH 28 2020

Simple Harmonic Motion

Solving this differential equation, we can find that the motion is described by the function $x(t) = A \cos(\omega t + \phi)$, where $\omega = 2\pi f$. The motion is periodic, repeating itself in a sinusoidal fashion with constant amplitude A . In addition to its amplitude, the motion of a simple linear harmonic oscillator is characterized by its period $T = 2\pi/\omega$, the time for a single oscillation or its frequency $f = 1/T$, the number of cycle per unit time. The position at a given time t also depends on the phase ϕ , which determines the starting point on the sine wave. The period and frequency are determined by the size of the mass m and the constant k i.e. force constant. The velocity and acceleration of a simple linear harmonic oscillator oscillate with the same frequency as the position, but with shifted phases. The velocity is maximal for zero displacement, while the acceleration is in the direction opposite to the displacement. The potential energy stored in a simple linear harmonic oscillator at position x is $U = \frac{1}{2}kx^2$.

Introduction :- It is to be familiar with many examples of repeated motion in our daily life. If an object returns to its original position a number of time, we call its motion repetitive. Typically in examples of repetitive motion of the human body are heartbeat and breathing. Many objects move in a repetitive way, a swing, a rocking chair and a clock pendulum, for example.

Probably the first understanding the ancients had of repetitive motion grew out of their observations of the motion of the sun and the phases of the moon. Strings undergoing repetitive motion are the physical basis of all stringed musical instruments. Kinematics of Simple Harmonic Motion :- One common characteristics of the motions of the heartbeat, clock pendulum, violin string, and the rotating phonograph turntable is that each motion has a well-defined time interval for each complete cycle of the motion. Any motion that repeat itself with equal time intervals is called periodic motion. Its period is the time required for one cycle of the motion.

Click Me

3. Creating a web page using XML and CSS.

CODE:

```
3(CSS_XHTML).html — C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-3 — Atom
File Edit View Selection Find Packages Help

3(CSS_XHTML).html
1 <!doctype html>
2 <html lang="en" dir="ltr">
3 <head>
4 <meta charset="utf-8">
5 <title>Cascading Style Sheets</title>
6 <style media="screen" type="text/css">
7 body{
8     background-color: rgb(0,0,122,0.3);
9     //background-image: url(img1.png);
10    // background-repeat: no-repeat;
11    // background-size: contain;
12 }
13
14 p {
15     padding-top: 10px;
16     padding-bottom: 10px;
17     text-indent: 1em;
18 }
19
20 div {
21     font-weight: normal;
22     color: #0000FF;
23 }
24
25 h1 {
26     font-family: tahoma,sans-serif,helvetica;
27     border-bottom: 1px dotted blue;
28 }
29
30 p {
31     font-size: 12pt;
32     font-family: sans-serif,arial;
33 }
34
35 .special {
36     color: purple;
37 }
38
39 * {
40     text-decoration: none;
41 }
42
43 a:hover {
44     text-decoration: underline;
45     font-weight: bold;
46     color: green;
47 }
48
49 a:visited {
50     color: #0000FF;
51 }
52
53 a:active {
54     background-color: rgb(126, 0, 0, 0.4);
55 }
56
57 h1 {
58     margin-left: 40px;
59 }
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61 aside {
62     font-size: 80%;
63     float: right;
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[illegible]

OUTPUT:

The screenshot shows a web browser window with the title 'Cascading Style Sheets'. The address bar shows the file path: 'C:/Users/HP/Documents/desktop/Application_programming(Lab_Work)/Q-3/3(CSS_XHTML).html'. The document content is as follows:

Cascading Style Sheets(CSS3)

Go to W3C

WHAT IS CSS3?

Formatting and presentation of any HTML document is done by using cascading style sheets(CSS3).

The three ways of using CSS3 are :

- INLINE STYLING
- EMBEDDED STYLE SHEETS
- LINKING EXTERNAL STYLE SHEETS

This page is to demonstrate the use of CSS3 in our HTML document. The CSS is used to style your html doc. file as it can be used in three ways by embedding it in your element tag the second way is to use the style element tag in the head of your HTML file and then calling the following tag for styling the last method is to create a separate file of css and then linking it to your html doc. file using link tag and href attribute.

The process of linking external style sheets to your HTML document is also known as skinning.

Benefits of using CSS3

1. Improved control over formatting
2. Improves site maintainability
3. Improves page download speed
4. Improves output flexibility

CSS3 Properties

Property Type	Property
Overflow	font-family
	font-size
	font-style
	font-weight
	font-face
	letter-spacing
FONTS	

BORDERS	border-style
	border-top
	border-top-color
	border-top-width
	padding
	padding-top, padding-bottom, padding-right, padding-left
SPACING	margin
	margin-top, margin-bottom, margin-left, margin-right
	max-height
	max-width
	min-height
	min-width
	width
	bottom, left, top and right
LAYOUTS	position
	visibility
	z-index
LISTS	list-style
	list-style-image
	list-style-type

Applying style class

To apply style class to specify the special style to a particular paragraph over a html document containing several paragraph element in the html document user shall declare the class attribute in that particular html element and then call it later in the embedded style sheet by using period(.)class.

► Pseudo Class

Measurement Unit in CSS

You can classify the measurement in CSS3 in the following type :

1. Relative : A pixel is a relative-length measurement- it varies in size, based on screen resolution. Other relative length includes em(which, as a measurement means the font's uppercase M height-the most frequently used font measurement), ex(the font's x-height-usually set to a lowercase x's height) and percentage(e.g., font-size:50%)
2. Absolute : They do not vary in size based on the system. These units are inches(in), centimeter(cm), millimeter(mm), point(pt; 1pt=1/72inches), and pica(pi; 1pc=12points)

Whenever possible, use relative-length measurement. If you use absolute-length measurement, your document may not scale well on some client browsers(e.g., smartphones)

To ensure that your style sheets work in various web browsers, test them on many web browsers, and use the W3C CSS validator

NOTES:

XHTML.pdf - Adobe Acrobat Pro DC

File Edit View Window Help

Home Tools html_form.pdf XHTML.pdf x Sign In

119%

~~HTML~~

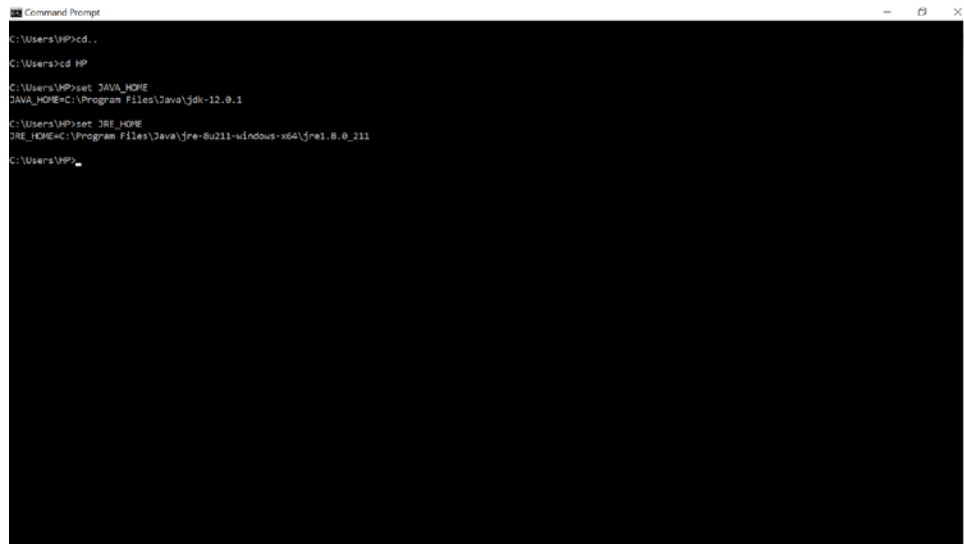
→ Extensible Hypertext Markup language : often referred as strictly followed HTML document.
As it holds some rules unlike html;

- ① Tags name must be lowercase.
- ② Tags must be properly nested.
Ex: `<a> Home ` ✓
(`<a> Home `) X
↳ But it may work in html
- ③ All tags must be closed properly even empty tags (`
`).

4. Configuring and Starting Apache Tomcat Server

Downloading Tomcat Server

1. Download the apache-tomcat 9.0.36 zip for required windows 32-bits or 64-bits zip file.(
<https://tomcat.apache.org/download-90.cgi>)
2. Unzip the file in c:// for ease of use.
Check for the following in tomcat folder:
 1. bin
 2. logs
 3. webapps
 4. work
 5. temp
 6. conf
 7. lib
3. Install the java jdk and jre packages according to the system configuration.
4. Create environment variable JAVA_HOME and provide variable path the java jdk (path).
5. Create environment variable JRE_HOME and provide variable path the java jre (path).
6. Check if the environment variable is set in command prompt:
set JAVA_HOME will return the variable path
set JRE_HOME will return the variable path if set.



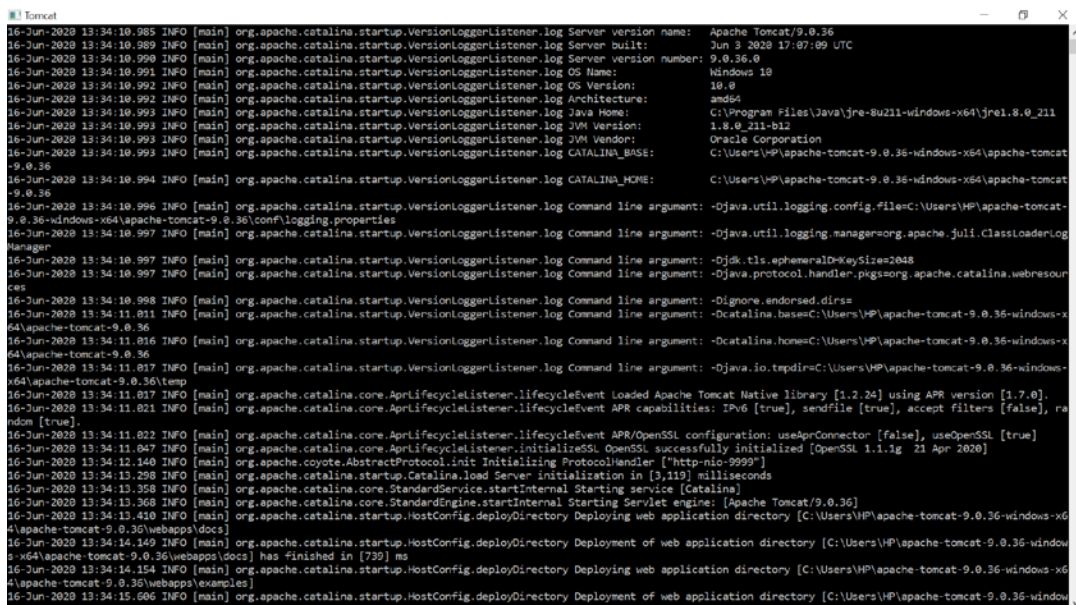
```
Command Prompt
C:\Users\HP>cd ..
C:\Users>cd HP
C:\Users\HP>set JAVA_HOME
JAVA_HOME=C:\Program Files\Java\jdk-12.0.1
C:\Users\HP>set JRE_HOME
JRE_HOME=C:\Program Files\Java\jre-8u211-windows-x64\jre1.8.0_211
C:\Users\HP>
```

Configuring Apache tomcat:

1. Open the conf folder in tomcat directory.
2. "conf\web.xml"; Enabling a Directory Listing
Open the configuration file "web.xml". We shall enable the directory listing by changing "listings" from "false" to "true" for the "default" servlet.
<param-value>true</param-value> like:
3. "conf\server.xml file"; set the TCP Port Number
<Connector port="9999" protocol="HTTP/1.1" Like -> You can set the port between 1024 and 65555.
4. "conf\context.xml"; Enabling Automatic Reload
In that we set reloadable="true" to the <Context> element to enable automatic reload after code changes.
Add reloadable="true" as in the following:
<Context reloadable="true"> </Context> Like
5. (Optional) "conf\tomcat-users.xml"
It is used to manage Tomcat by adding the highlighted lines, inside the <tomcat-users> elements. In that we can add a password and username as an optional step.
6. Your Apache Tomcat Server is now configured.

Start Server

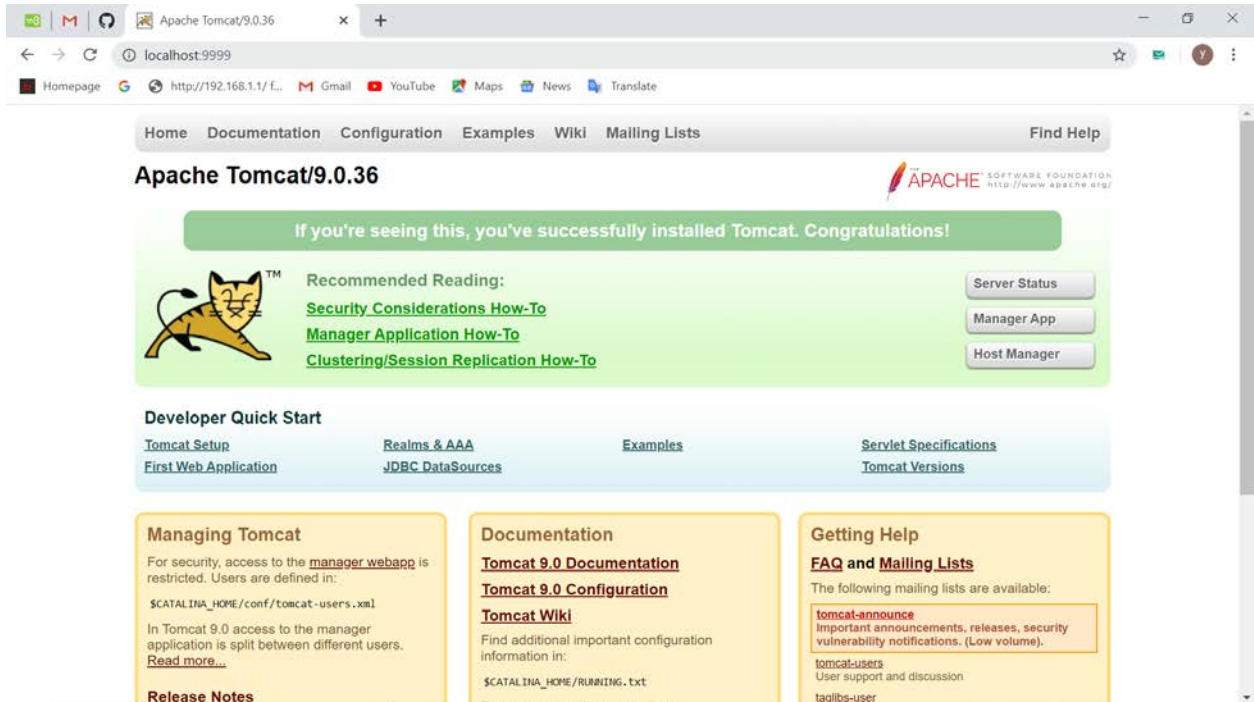
1. Launch in command prompt by changing the directory(cd) to tomcat bin folder where all executable files exist.
cd C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin
2. Now add command (startup.bat) opens the tomcat server in another command window.
3. Check for the port in tomcat window is set to 9999.



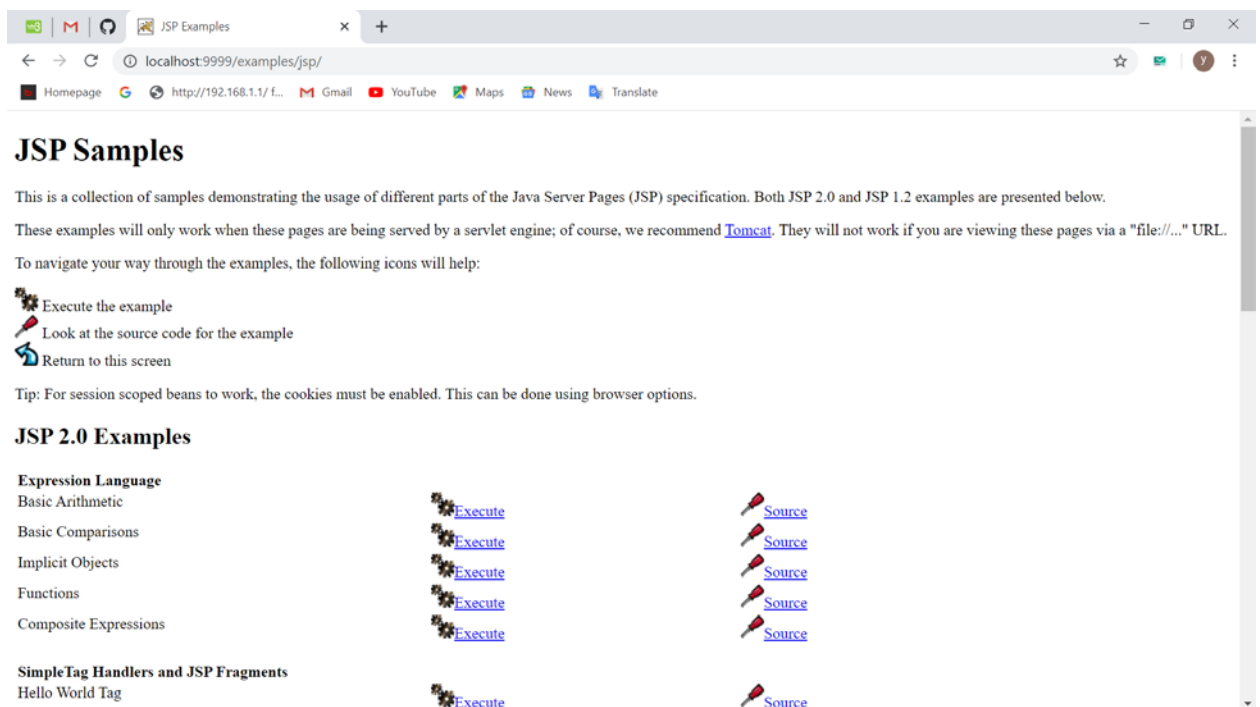
```
16-Jun-2020 13:34:10.985 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version name: Apache Tomcat/9.0.36
16-Jun-2020 13:34:10.989 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server built: Jun 3 2020 17:07:09 UTC
16-Jun-2020 13:34:10.990 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version number: 9.0.36.0
16-Jun-2020 13:34:10.991 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Name: Windows 10
16-Jun-2020 13:34:10.992 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Version: 10.0
16-Jun-2020 13:34:10.992 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Architecture: amd64
16-Jun-2020 13:34:10.993 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Java Home: C:\Program Files\Java\jre-8u211-windows-x64\jre1.8.0_211
16-Jun-2020 13:34:10.993 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log JVM Version: 1.8.0_211-b12
16-Jun-2020 13:34:10.993 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log JVM Vendor: Oracle Corporation
16-Jun-2020 13:34:10.993 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log CATALINA_BASE: C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36
16-Jun-2020 13:34:10.994 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log CATALINA_HOME: C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36
16-Jun-2020 13:34:10.996 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.config.file=C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\conf\logging.properties
16-Jun-2020 13:34:10.997 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
16-Jun-2020 13:34:10.997 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djdk.tls.ephemeralDHKeySize=2048
16-Jun-2020 13:34:10.997 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.protocol.handler.pkgs=org.apache.catalina.webresources
16-Jun-2020 13:34:10.998 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dignore.endorsed.dirs
16-Jun-2020 13:34:11.011 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.base=C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36
16-Jun-2020 13:34:11.016 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.home=C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36
16-Jun-2020 13:34:11.017 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.io.tmpdir=C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\temp
16-Jun-2020 13:34:11.017 INFO [main] org.apache.catalina.core.AprLifecycleListener.lifecycleEvent Loaded Apache Tomcat Native library [1.2.24] using APR version [1.7.0].
16-Jun-2020 13:34:11.021 INFO [main] org.apache.catalina.core.AprLifecycleListener.lifecycleEvent APR capabilities: IPv6 [true], sendfile [true], accept filters [false], random [true]
16-Jun-2020 13:34:11.022 INFO [main] org.apache.catalina.core.AprLifecycleListener.lifecycleEvent APR/OpenSSL configuration: useAprConnector [false], useOpenSSL [true]
16-Jun-2020 13:34:11.047 INFO [main] org.apache.catalina.core.AprLifecycleListener.initializeSSL OpenSSL successfully initialized [OpenSSL 1.1.1g 21 Apr 2020]
16-Jun-2020 13:34:12.140 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-9999"]
16-Jun-2020 13:34:13.298 INFO [main] org.apache.catalina.startup.Catalina.load Server initialization in [3,119] milliseconds
16-Jun-2020 13:34:13.358 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service [Catalina]
16-Jun-2020 13:34:13.368 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet engine: [Apache Tomcat/9.0.36]
16-Jun-2020 13:34:13.410 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory [C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\webapps\docs]
16-Jun-2020 13:34:14.149 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\webapps\docs] has finished in [739] ms
16-Jun-2020 13:34:14.154 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deploying web application directory [C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\webapps\examples]
16-Jun-2020 13:34:15.606 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\webapps\examples] has finished in [156] ms
```

Access the Server:

1. Open a browser then enter the URL "http://localhost:9999" to access the Tomcat server's welcome page.



2. Now try the URL http://localhost:9999/examples to view JSP and servlet examples.



3. To shutdown the server use shutdown.bat in command prompt or simply apply ctrl+c in tomcat window.

```
Command Prompt
C:\Users\HP>cd..
C:\Users\HP>cd HP
C:\Users\HP>set JAVA_HOME
JAVA_HOME=C:\Program Files\Java\jdk-12.0.1
C:\Users\HP>set JRE_HOME
JRE_HOME=C:\Program Files\Java\jre-8u211-windows-x64\jre1.8.0_211
C:\Users\HP>cd C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin
C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin>startup.bat
Using CATALINA_BASE:   "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36"
Using CATALINA_HOME:   "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36"
Using CATALINA_TMPDIR: "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\temp"
Using JRE_HOME:        "C:\Program Files\Java\jre-8u211-windows-x64\jre1.8.0_211"
Using CLASSPATH:       "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin\bootstrap.jar;C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin\tomcat-juli.jar"
C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin>shutdown.bat
Using CATALINA_BASE:   "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36"
Using CATALINA_HOME:   "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36"
Using CATALINA_TMPDIR: "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\temp"
Using JRE_HOME:        "C:\Program Files\Java\jre-8u211-windows-x64\jre1.8.0_211"
Using CLASSPATH:       "C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin\bootstrap.jar;C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin\tomcat-juli.jar"
C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin>
C:\Users\HP\apache-tomcat-9.0.36-windows-x64\apache-tomcat-9.0.36\bin>
```

5. MODIFICATION OF WEB.XML

1. What is the Default Servlet ?

The default servlet is the servlet which serves static resources as well as serves the directory listings (if directory listings are enabled). It is declared globally in `$CATALINA_BASE/conf/web.xml`.

2. What is Web XML?

The web.xml file is the deployment descriptor for a Servlet-based Java **web** application (which most Java **web** apps are). Among other things, it declares which Servlets exist and which URLs they handle. The part you cite defines a Servlet Filter. Servlet filters can do all kinds of preprocessing on requests.

3. Why we use web.xml?

Generally speaking, this is the configuration file of web applications in java. It instructs the servlet container (tomcat for ex.) which classes to load, what parameters to set in the context, and how to intercept requests coming from browsers.

There you specify:

- what servlets (and filters) you want to use and what URLs you want to map them to
- listeners - classes that are notified when some events happen (context starts, session created, etc)
- configuration parameters (context-params)
- error pages, welcome files
- security constraints

In servlet 3.0 many of the web.xml parts are optional. These configurations can be done via annotations (`@WebServlet`, `@WebListener`).

4. How to modify web.xml to enable https?

To modify the web.xml file to enable HTTPS

1. Open the web.xml file usually located in the `$CATALINA_HOME/webapps/moab/WEB-INF/` directory.
2. Add a `<security-constraint>` section to cause all pages to be hosted with HTTPS.

Code:

```
<web-app>
...
  <security-constraint>
    <web-resource-collection>
      <web-resource-name>Viewpoint Secure URLs</web-resource-name>
```



```

        <url-pattern>/*</url-pattern>
    </web-resource-collection>
    <user-data-constraint>
        <transport-guarantee>CONFIDENTIAL</transport-guarantee>
    </user-data-constraint>
</security-constraint>
</web-app>

```

MODIYING WEB.XML

The DefaultServlet allows the following initParamters:

Property	Description
Debug	Debugging level. It is not very useful unless you are a tomcat developer. As of this writing, useful values are 0, 1, 11, 1000. [0]
Listings	<p>If no welcome file is present, can a directory listing be shown? value may be true or false [false]</p> <p>Welcome files are part of the servlet api.</p> <p>WARNING: Listings of directories containing many entries are expensive. Multiple requests for large directory listings can consume significant proportions of server resources.</p>
Precompressed	<p>If a precompressed version of a file exists (a file with <code>.br</code> or <code>.gz</code> appended to the file name located alongside the original file), Tomcat will serve the precompressed file if the user agent supports the matching content encoding (br or gzip) and this option is enabled. [false]</p> <p>The precompressed file with the with <code>.br</code> or <code>.gz</code> extension will be accessible if requested directly so if the original resource is protected with a security constraint, the precompressed versions must be similarly protected.</p> <p>It is also possible to configure the list of precompressed formats. The syntax is comma separated list of [content-encoding]=[file-extension] pairs. For example: <code>br=.br,gzip=.gz,bzip2=.bz2</code>. If multiple formats are specified, the client supports more than one and the client does not express a preference, the order of the list of formats will be treated as the server preference order and used to select the format returned.</p>
ReadmeFile	If a directory listing is presented, a readme file may also be presented with the listing. This file is inserted as is so it may contain HTML.
GlobalXsltFile	If you wish to customize your directory listing, you can use an XSL transformation. This value is a relative file name (to either <code>\$CATALINA_BASE/conf/</code> or <code>\$CATALINA_HOME/conf/</code>) which will be used for all directory listings. This can be overridden per context and/or per directory. See contextXsltFile and localXsltFile below. The format of the xml is shown below.
contextXsltFile	You may also customize your directory listing by context by configuring contextXsltFile. This must be a context relative path (e.g.: <code>/path/to/context.xslt</code>) to a file with a <code>.xsl</code> or <code>.xslt</code> extension. This overrides globalXsltFile. If this value is present but a file does not

	exist, then <code>globalXsltFile</code> will be used. If <code>globalXsltFile</code> does not exist, then the default directory listing will be shown.
<code>LocalXsltFile</code>	You may also customize your directory listing by directory by configuring <code>localXsltFile</code> . This must be a file in the directory where the listing will take place to with a <code>.xsl</code> or <code>.xslt</code> extension. This overrides <code>globalXsltFile</code> and <code>contextXsltFile</code> . If this value is present but a file does not exist, then <code>contextXsltFile</code> will be used. If <code>contextXsltFile</code> does not exist, then <code>globalXsltFile</code> will be used. If <code>globalXsltFile</code> does not exist, then the default directory listing will be shown.
<code>Input</code>	Input buffer size (in bytes) when reading resources to be served. [2048]
<code>Output</code>	Output buffer size (in bytes) when writing resources to be served. [2048]
<code>Readonly</code>	Is this context "read only", so HTTP commands like PUT and DELETE are rejected? [true]
<code>FileEncoding</code>	File encoding to be used when reading static resources. [platform default]
<code>UseBomIfPresent</code>	If a static file contains a byte order mark (BOM), should this be used to determine the file encoding in preference to <code>fileEncoding</code> . [true]
<code>SendfileSize</code>	If the connector used supports <code>sendfile</code> , this represents the minimal file size in KB for which <code>sendfile</code> will be used. Use a negative value to always disable <code>sendfile</code> . [48]
<code>UseAcceptRanges</code>	If true, the <code>Accept-Ranges</code> header will be set when appropriate for the response. [true]
<code>ShowServerInfo</code>	Should server information be presented in the response sent to clients when directory listing is enabled. [true]
<code>SortListings</code>	Should the server sort the listings in a directory. [false]
<code>sortDirectoriesFirst</code>	Should the server list all directories before all files. [false]
<code>AllowPartialPut</code>	Should the server treat an HTTP PUT request with a <code>Range</code> header as a partial PUT? Note that RFC 7233 clarified that <code>Range</code> headers are only valid for GET requests. [true]

6.Creating web page using PHP.

CODE:

```
formphp.html — C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-6 — Atom
File Edit View Selection Find Packages Help

formphp.html
1 <!DOCTYPE html>
2 <html lang="en" dir="ltr">
3   <head>
4     <meta charset="utf-8">
5     <title></title>
6   </head>
7   <body>
8     <h2>Registration Form</h2>
9
10    <form action="formphp.php" method="POST">
11
12      First name:
13      <input type="text" name="firstname">
14
15      <br> Last name:
16      <input type="text" name="lastname">
17
18      <br> Agree to Terms of Service:
19      <input type="checkbox" name="agree">
20      <br>
21
22      <input type="hidden" name="form_submitted" value="1" />
23
24      <input type="submit" value="Submit" >
25
26    </form>
27  </body>
28 </html>
29

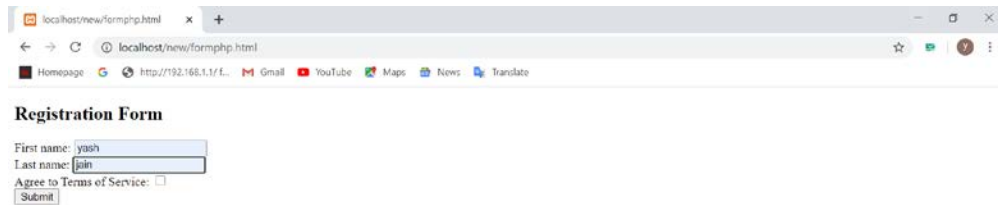
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-6\formphp.html 1:1 CRLF UTF-8 HTML no branch Not on branch GitHub Git (4031)

formphp.php — C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-6 — Atom
File Edit View Selection Find Packages Help

formphp.php
1 <?php
2 if(isset($_POST["form_submitted"]))
3 {
4   if(!isset($_POST["agree"]))
5     echo "You haven't agreed to the terms and services";
6   else
7     echo "Thank You !<br>".$_POST["firstname"]." ".$_POST["firstname"]." you have been successfully registered";
8 }
9 ?>
10

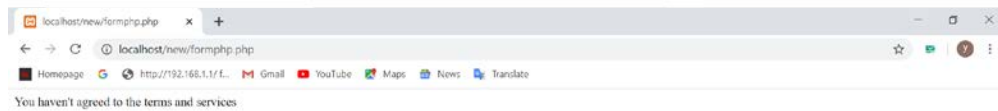
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-6\formphp.php 1:1 CRLF UTF-8 PHP no branch Not on branch GitHub Git (4031)
```

OUTPUT:

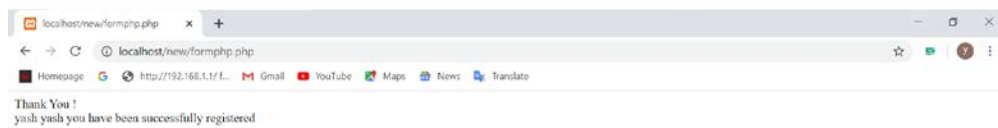


A screenshot of a web browser window. The address bar shows 'localhost/new/formphp.html'. The page title is 'Registration Form'. The form contains the following fields and elements:

- First name:
- Last name:
- Agree to Terms of Service: ☐
- Submit:

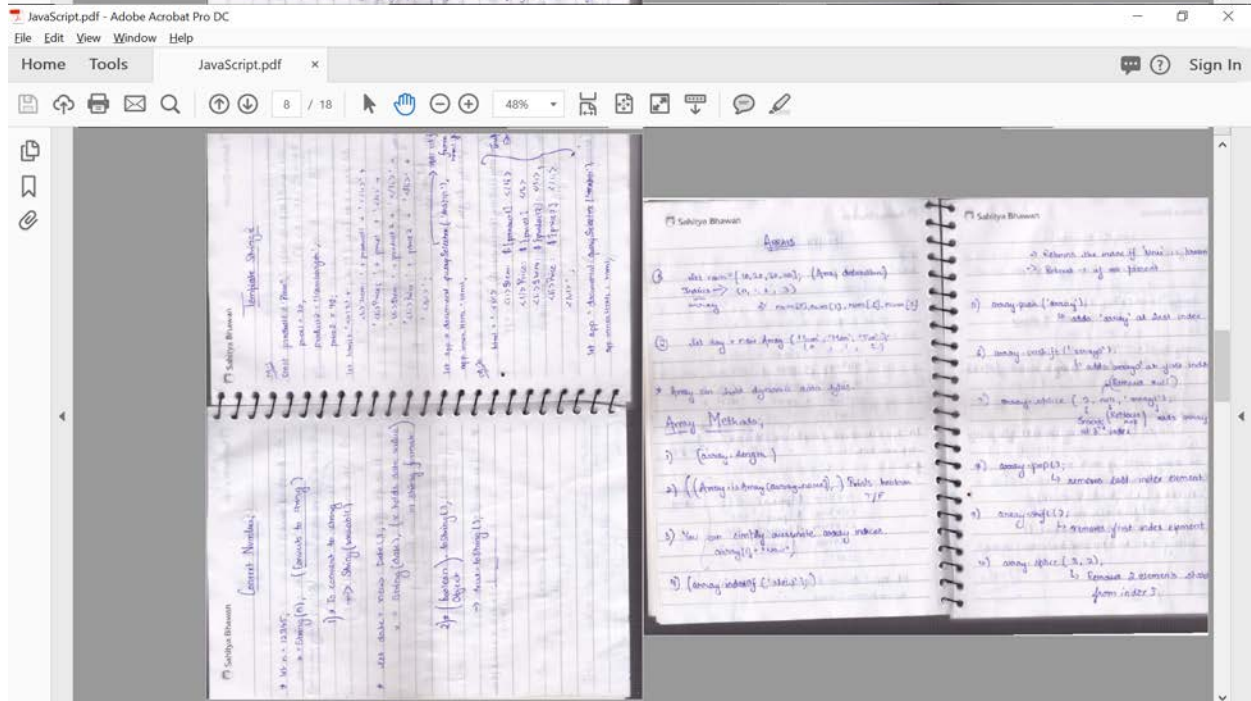
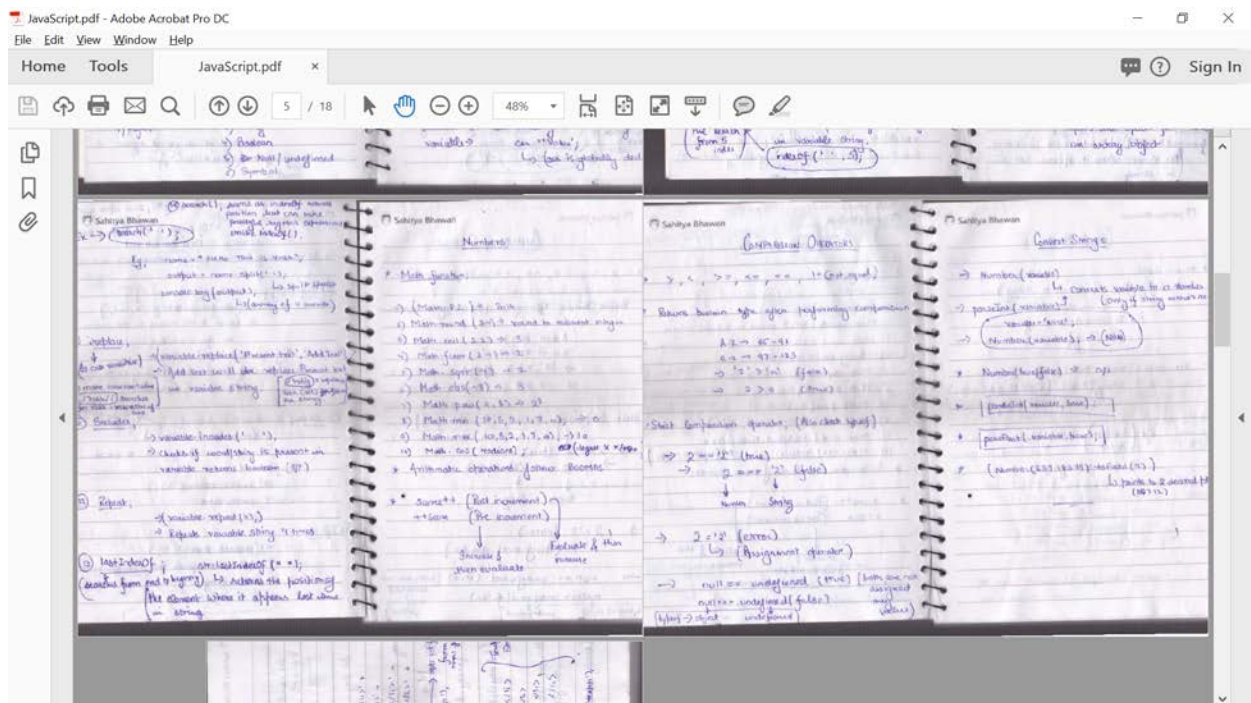


A screenshot of a web browser window. The address bar shows 'localhost/new/formphp.php'. The page content displays the message: 'You haven't agreed to the terms and services'.

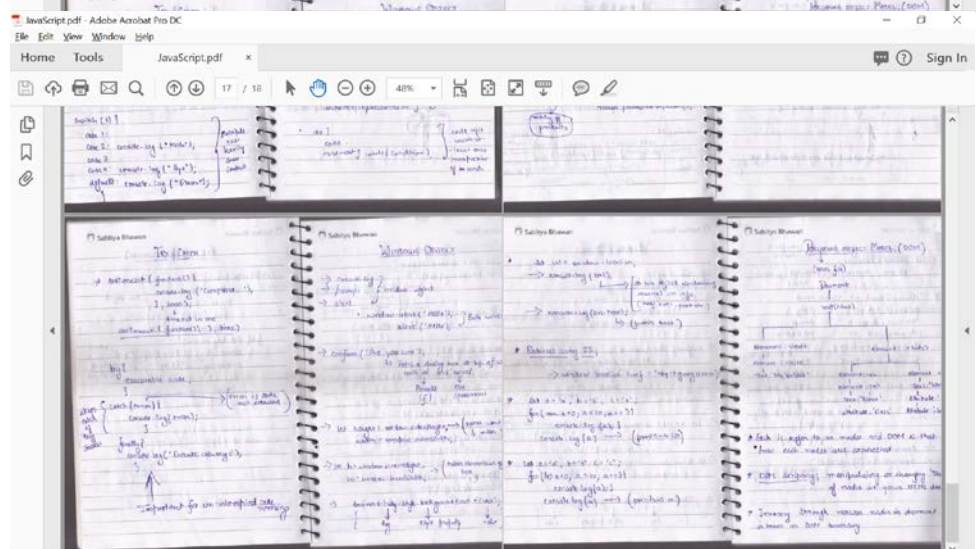


A screenshot of a web browser window. The address bar shows 'localhost/new/formphp.php'. The page content displays the message: 'Thank You !
yash yash you have been successfully registered'.

The image displays a collection of handwritten notes on JavaScript arrays and strings, organized into a grid. The notes are written in blue and black ink on lined paper. The top section focuses on arrays, detailing how to create them (e.g., using square brackets, literals, or the `Array` constructor), how to access elements (using indices), and how to modify them (using `push`, `pop`, `shift`, `unshift`, etc.). It also covers array methods like `length`, `indexOf`, and `lastIndexOf`. The bottom section focuses on strings, explaining that they are immutable and how to access characters (using brackets or `charAt`/`charCodeAt`), and lists various string methods like `concat`, `indexOf`, `substring`, `slice`, `replace`, and `split`.



[illegible][illegible]



CODE:

C:\Users\HP\Documents\desktop\Application programming(Lab Work)\Q-8\File\registration.php 90:1

OUTPUT:

Simple Registration Form in PHP x +

localhost/new/registration.php


Homepage http://192.168.1.1/f... Gmail YouTube Maps News Translate

Registration Form in PHP with Validation

Please fill all fields in the form

Name

Email

 Please include an '@' in the email address. '12213' is missing an '@'.

Confirm Password

Already have an account? [Login](#)

Simple Registration Form in PHP x +

localhost/new/registration.php

Homepage http://192.168.1.1/f... Gmail YouTube Maps News Translate

Notice: Undefined variable: error in C:\xampp\htdocs\new\registration.php on line 24

Notice: Undefined variable: sql in C:\xampp\htdocs\new\registration.php on line 29

Error: Table 'registration.users' doesn't exist

Registration Form in PHP with Validation

Please fill all fields in the form

Name Name must contain only alphabets and space

Email

Mobile Mobile number must be minimum of 10 characters

Password

Confirm Password

Already have an account? [Login](#)

Hoisting on XAMPP Server (Apache Tomcat)

1. Install the XAMPP Server on your system as per the system requirements.
2. Configure the Apache Server on Starting the port and PIDs will be assigned to your system
3. Start MySQL for database if present in your document or simply create the database in myPhpAdmin in Xampp localhost/dashboard.

The image shows the XAMPP Control Panel v3.2.4 window and a web browser displaying the XAMPP Apache Friends homepage.

XAMPP Control Panel v3.2.4

Service	Module	PID(s)	Port(s)	Actions
Apache	10440 10418	80, 443	Stop Admin Config Logs	
MySQL	3248	3306	Stop Admin Config Logs	
FileZilla	8228	21, 14147	Stop Admin Config Logs	
Mercury			Start Admin Config Logs	
Tomcat			Start Admin Config Logs	

Log Output:

```
2:47:10 PM [main] Initializing Control Panel
2:47:10 PM [main] Windows Version: Home 64-bit
2:47:10 PM [main] XAMPP Version: 7.2.29
2:47:10 PM [main] Control Panel Version: 3.2.4 [Compiled: Jun 5th 2019]
2:47:10 PM [main] You are not running with administrator rights! This will work for
2:47:10 PM [main] most application stuff but whenever you do something with services
2:47:10 PM [main] there will be a security dialogue or things will break! So think
2:47:10 PM [main] about running this application with administrator rights!
2:47:10 PM [main] XAMPP Installation Directory: "c:\xampp\"
2:47:10 PM [main] Checking for prerequisites
2:47:11 PM [main] All prerequisites found
2:47:11 PM [main] Initializing Modules
2:47:11 PM [Tomcat] Java is already running on port 8005!
2:47:11 PM [Tomcat] Is Tomcat already running?
2:47:11 PM [main] Starting Check-Timer
2:47:11 PM [main] Control Panel Ready
2:47:14 PM [Apache] Attempting to start Apache app...
2:47:15 PM [Apache] Status change detected: running
2:47:15 PM [mysql] Attempting to start MySQL app...
2:47:15 PM [mysql] Status change detected: running
2:47:16 PM [filezilla] Attempting to start FileZilla app...
2:47:16 PM [filezilla] Status change detected: running
```

Web Browser (localhost/dashboard/)

Apache Friends Applications FAQs HOW-TO Guides PHPInfo phpMyAdmin

XAMPP Apache + MariaDB + PHP + Perl

Welcome to XAMPP for Windows 7.2.29

You have successfully installed XAMPP on this system! Now you can start using Apache, MariaDB, PHP and other components. You can find more info in the FAQs section or check the HOW-TO Guides for getting started with PHP applications.

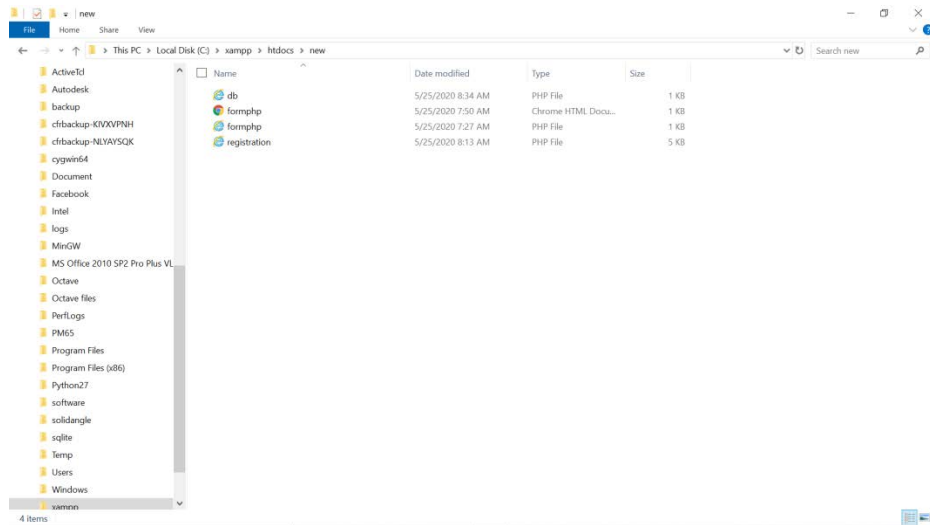
XAMPP is meant only for development purposes. It has certain configuration settings that make it easy to develop locally but that are insecure if you want to have your installation accessible to others. If you want have your XAMPP accessible from the internet, make sure you understand the implications and you checked the FAQs to learn how to protect your site. Alternatively you can use WAMP, MAMP or LAMP which are similar packages which are more suitable for production.

Start the XAMPP Control Panel to check the server status.

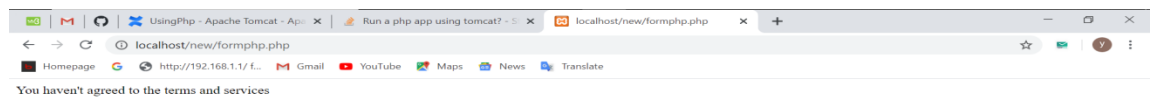
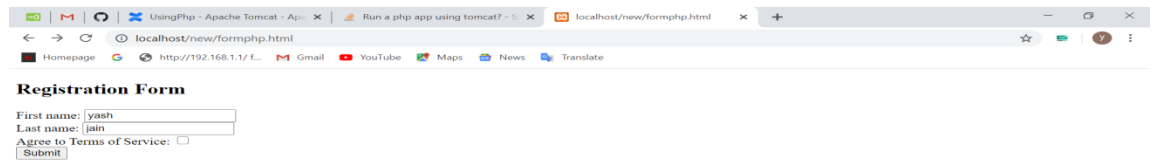
Community

Now open Xampp folder in c directory and open htdocs folder

1. Create new folder(new) for running php on Apache.
 - a. C:\xampp\htdocs\new
2. Now save the php and html file in new folder.



3. Open localhost in browser then provide the following address to run php.



9. Writing and Understanding python.

CODE:

```
apy — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs) — Atom
File Edit View Selection Find Packages Help

apy

1: for loop in python
# for val in range(5):
#     print(val)

# if else condition example
num=1
if num >= 0:
    print('Positive')
else:
    print('Negative')

# string operation in python
string="hello"
print(string)
string1=" python"
print(string + string1)

# boolean values in python
a= True
b= False
print(a)
print(b)
a= not True means false
b= not False means true
print(a)
print(b)

# in operator
animal="dog"
if animal in ["lion","cat","dog"]: # if searched as dog is present in in operator
    print('Your animal is in the list')
if animal not in ["lion","cat","dog"]: # if condition isn't work so not in states that list if present to not be searched
    print('Animal searched is not present')

# taking user input
name=input('Enter your name ')
age=input('Enter your age ')
print('Your name is : ' + name)
print('Your age is : ' + age)

C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs)\a.py 1:1 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

```
apy — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs) — Atom
File Edit View Selection Find Packages Help

apy

# taking user input
name=input('Enter your name ')
age=input('Enter your age ')
print('Your name is : ' + name)
print('Your age is : ' + age)

# calculate age
name=input('Enter your name ')
print('What is your age?',(name),'?')
age=input('Age : ')
# first make assigning integer type to age variable
days=age*365
print(name, ' has been alive for ', days, ' days')

# Upper and lowercase functions
name1 = input('Enter your name ')
print(name1.lower())
print(name1.upper())

# REPETING IN STRINGS
str is for reading it is for tab
print("Natural numbers are 1\n2\n3\n4\n5 etc.")

# Combining STRINGS
first_name="Yash "
last_name="Kain"
full_name=first_name + last_name
print(full_name)

# def() functions
name="Yash Kain "
age=19
total=(name+str(age)) # Converts an integer to a string
print(total)

# writing if() functions
name=input('What's your name Yash?')
print("Hi "+name+" How are you?")
user=input()
print("Thanks "+name+" Goodbye!!")

C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs)\a.py 84:1 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

OUTPUT:

```
Command Prompt
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>
a.py
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>
a.py
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>
a.py
Positive
hello
hello Python
True
False
False
True
Your animal is in the list
Enter your name yash
Enter your age 12
Your name is : yash
Your age is : 12
Enter your name yash
What is your age? yash ?
Age : 12
yash has been alive for 4380 days
Enter your name yash
yash
YASH
Natural numbers are :
1
2
3
4
5 etc.
Yash Jain
Yash Jain 19
What's your name ?
yash
Hi yash How are you?
fine
Thanks yash GoobBye!!
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>
```


10.Using python libraries for mathematics calculations.

CODE:

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs) — Atom
File Edit View Selection Find Packages Help

calculator.py
1 from tkinter import *
2 from tkinter import ttk
3
4 ...
5
6 USE CASE
7
8 1. User clicks a number
9     a. Get current value in entry widget
10    b. Put new value to the right of current value
11    c. Clear the entry box
12    d. Insert the new number
13    * Note Start entry as clear
14
15 2. User clicks a math button
16     a. Check if there is a value in entry
17     b. Store which math button was pressed
18     c. Call the matching math calculation based on button press
19     d. Store current entry value
20     e. Clear entry widget
21     f. Prepare for next entry so a calculation can be made
22     * Note handle conversion of values to floats
23
24 3. User clicks the equal button
25     a. Check if a math button has been clicked
26     b. Check which math button was clicked last
27     c. Get the stored 1st number value entered
28     d. Get the value currently in the entry widget
29     e. Perform the correct calculation
30     f. Clear entry widget
31     g. Place the new calculation solution in entry
32
33 4. User clicks AC
34     a. Clear all math button presses
35     b. Clear values in entry widget
36     c. Put a 0 in entry widget
37     d. Store 0 in current value
38 ...
39
40 class Calculator:
41
42 C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)\calculator.py 1:1 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs) — Atom
File Edit View Selection Find Packages Help

calculator.py
39
40 class Calculator:
41     # Stores the current value to display in the entry
42     calc_value = 0.0
43     # Will define if this was the last math button clicked
44     div_trigger = False
45     mult_trigger = False
46     add_trigger = False
47     sub_trigger = False
48
49     # Called anytime a number button is pressed
50     def button_press(self, value):
51
52         if value == 'AC':
53             # Make false to cancel out previous math button clicks
54             self.add_trigger = False
55             self.sub_trigger = False
56             self.mult_trigger = False
57             self.div_trigger = False
58             # Clear the entry box
59             # (0, "end") refers to all characters in the widget
60             self.number_entry.delete(0, "end")
61
62         else:
63             # Get the current value in the entry
64             entry_val = self.number_entry.get()
65
66             # Put the new value to the right of it
67             # If it was 1 and 2 is pressed it is now 12
68             # Otherwise the new number goes on the left
69             entry_val += value
70
71             # Clear the entry box
72             self.number_entry.delete(0, "end")
73
74             # Insert the new value going from left to right
75             self.number_entry.insert(0, entry_val)
76
77     # Returns True or False if the string is a float
78     def isfloat(self, str_val):
79         try:
80             # If the string isn't a float float() will throw a
81             # ValueError
82
83 C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)\calculator.py 65:51 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\python_programs — Atom
File Edit View Selection Find Packages Help

calculator.py
11
12     float(str_val)
13     # If there is a value you want to return use return
14     return True
15 except ValueError:
16     return False
17
18 # Handles logic when math buttons are pressed
19 def math_button_press(self, value):
20
21     # Only do anything if entry currently contains a number
22     if self.isfloat(str(self.number_entry.get())):
23
24         # Only allow to cancel out previous math button click
25         self.add_trigger = False
26         self.sub_trigger = False
27         self.mult_trigger = False
28         self.div_trigger = False
29
30         # Set the value out of the entry box for the calculation
31         self.calc_value = float(self.entry_value.get())
32         # Set the math button click so when equals is clicked
33         # that function knows what calculation to use
34         if value == "/":
35             self.div_trigger = True
36         elif value == "*":
37             self.mult_trigger = True
38         elif value == "+":
39             self.add_trigger = True
40         else:
41             self.sub_trigger = True
42
43         # Clear the entry box
44         self.number_entry.delete(0, "end")
45
46 # Performs a mathematical operation by having the value before
47 # the math button is clicked and the current value. Then perform
48 # the right calculation by checking what math button was clicked
49 # last
50 def equal_button_press(self):
51
52     # Make sure a math button was clicked
53     if self.add_trigger or self.sub_trigger or self.mult_trigger or self.div_trigger:
54
55         if self.add_trigger or self.sub_trigger or self.mult_trigger or self.div_trigger:
56             solution = self.calc_value + float(self.entry_value.get())
57             solution = self.calc_value - float(self.entry_value.get())
58             solution = self.calc_value * float(self.entry_value.get())
59             solution = self.calc_value / float(self.entry_value.get())
60
61         # Clear the entry box
62         self.number_entry.delete(0, "end")
63
64         self.number_entry.insert(0, solution)
65
66 def __init__(self, root):
67     # Will hold the changing value stored in the entry
68     self.entry_value = StringVar(root, value="")
69
70     # Define rules for the app
71     root.title("Calculator")
72
73     # Defines the width and height of the window
74     root.geometry("500x245")
75
76     # Block resizing of window
77     root.resizable(width=False, height=False)
78
79     # Customizes the styling for the buttons and entry
80     style = ttk.Style()
81     style.configure("TButton",
82                     font="Serif 15",
83                     padding=10)
84
85     style.configure("TEntry",
86                     font="Serif 16",
87                     padding=10)
88
89     # Create the text entry box
90     self.number_entry = ttk.Entry(root,
91                                   textvariable=self.entry_value, width=50)
```

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\python_programs — Atom
File Edit View Selection Find Packages Help

calculator.py
12
13     if self.add_trigger or self.sub_trigger or self.mult_trigger or self.div_trigger:
14
15         if self.add_trigger:
16             solution = self.calc_value + float(self.entry_value.get())
17         elif self.sub_trigger:
18             solution = self.calc_value - float(self.entry_value.get())
19         elif self.mult_trigger:
20             solution = self.calc_value * float(self.entry_value.get())
21         else:
22             solution = self.calc_value / float(self.entry_value.get())
23
24         # Clear the entry box
25         self.number_entry.delete(0, "end")
26
27         self.number_entry.insert(0, solution)
28
29 def __init__(self, root):
30     # Will hold the changing value stored in the entry
31     self.entry_value = StringVar(root, value="")
32
33     # Define rules for the app
34     root.title("Calculator")
35
36     # Defines the width and height of the window
37     root.geometry("500x245")
38
39     # Block resizing of window
40     root.resizable(width=False, height=False)
41
42     # Customizes the styling for the buttons and entry
43     style = ttk.Style()
44     style.configure("TButton",
45                     font="Serif 15",
46                     padding=10)
47
48     style.configure("TEntry",
49                     font="Serif 16",
50                     padding=10)
51
52     # Create the text entry box
53     self.number_entry = ttk.Entry(root,
54                                   textvariable=self.entry_value, width=50)
```

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs) — Atom
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calculator.py
1 # Create the root window
2 root = Tk()
3 # Create the calculator class
4 self.number_entry = Entry(root, textvariable=self.entry_value, width=50)
5 self.number_entry.grid(row=0, columnspan=4, sticky=(W, E))
6
7 # ----- 1st Row -----
8 self.button7 = ttk.Button(root, text="7", command=lambda: self.button_press('7')).grid(row=1, column=0,
9 sticky=(W, E))
10 self.button8 = ttk.Button(root, text="8", command=lambda: self.button_press('8')).grid(row=1, column=1,
11 sticky=(W, E))
12 self.button9 = ttk.Button(root, text="9", command=lambda: self.button_press('9')).grid(row=1, column=2,
13 sticky=(W, E))
14 self.button_div = ttk.Button(root, text="/", command=lambda: self.math_button_press('/')).grid(row=1, column=3,
15 sticky=(W, E))
16
17 # ----- 2nd Row -----
18 self.button4 = ttk.Button(root, text="4", command=lambda: self.button_press('4')).grid(row=2, column=0,
19 sticky=(W, E))
20 self.button5 = ttk.Button(root, text="5", command=lambda: self.button_press('5')).grid(row=2, column=1,
21 sticky=(W, E))
22 self.button6 = ttk.Button(root, text="6", command=lambda: self.button_press('6')).grid(row=2, column=2,
23 sticky=(W, E))
24 self.button_mult = ttk.Button(root, text="*", command=lambda: self.math_button_press('*')).grid(row=2, column=3,
25 sticky=(W, E))
26
27 # ----- 3rd Row -----
28 self.button1 = ttk.Button(root, text="1", command=lambda: self.button_press('1')).grid(row=3, column=0,
29 sticky=(W, E))
30 self.button2 = ttk.Button(root, text="2", command=lambda: self.button_press('2')).grid(row=3, column=1,
31 sticky=(W, E))
32 self.button3 = ttk.Button(root, text="3", command=lambda: self.button_press('3')).grid(row=3, column=2,
33 sticky=(W, E))
34
35 C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs)\calculator.py 201:1 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

```
calculator.py — C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs) — Atom
File Edit View Selection Find Packages Help

calculator.py
35 self.button6 = ttk.Button(root, text="6", command=lambda: self.button_press('6')).grid(row=2, column=2,
36 sticky=(W, E))
37 self.button_mult = ttk.Button(root, text="*", command=lambda: self.math_button_press('*')).grid(row=2, column=3,
38 sticky=(W, E))
39
40 # ----- 3rd Row -----
41 self.button1 = ttk.Button(root, text="1", command=lambda: self.button_press('1')).grid(row=3, column=0,
42 sticky=(W, E))
43 self.button2 = ttk.Button(root, text="2", command=lambda: self.button_press('2')).grid(row=3, column=1,
44 sticky=(W, E))
45 self.button3 = ttk.Button(root, text="3", command=lambda: self.button_press('3')).grid(row=3, column=2,
46 sticky=(W, E))
47 self.button_add = ttk.Button(root, text="+", command=lambda: self.math_button_press('+')).grid(row=3, column=3,
48 sticky=(W, E))
49
50 # ----- 4th Row -----
51 self.button_clear = ttk.Button(root, text="AC", command=lambda: self.button_press('AC')).grid(row=4, column=0,
52 sticky=(W, E))
53 self.button0 = ttk.Button(root, text="0", command=lambda: self.button_press('0')).grid(row=4, column=1,
54 sticky=(W, E))
55 self.button_equal = ttk.Button(root, text="=", command=lambda: self.equal_button_press()).grid(row=4, column=2,
56 sticky=(W, E))
57 self.button_sub = ttk.Button(root, text="-", command=lambda: self.math_button_press('-')).grid(row=4, column=3,
58 sticky=(W, E))
59
60 # Get the root window object
61 root = Tk()
62 # Create the calculator
63 calc = Calculator(root)
64 # Run the app until exited
65 root.mainloop()
66
67 C:\Users\HP\Documents\desktop\Application_programming\Lab_Work\Q-9\9(python_programs)\calculator.py 228:1 CRLF UTF-8 Python no branch Not on branch GitHub Git (4031)
```

OUTPUT:

```
Command Prompt - calculator.py
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>
a.py
C:\Users\
a.py
839520.0
C:\Users
a.py
Positive
hello
hello Py
True
False
False
True
Your ani
Enter yo
Enter yo
Your nam
Your age is : 12
Enter your name yash
What is your age? yash ?
Age : 12
yash has been alive for 4380 days
Enter your name yash
yash
YASH
Natural numbers are :
1
2
3
4
5 etc.
Yash Jain
Yash Jain 19
What's your name ?
yash
Hi yash How are you?
Fine
Thanks yash GoobBye!!
C:\Users\HP\Documents\desktop\Application_programming(Lab_Work)\Q-9\9(python_programs)>calculator.py
```

7	8	9	/
4	5	6	*
1	2	3	+
AC	0	=	-