ASSIGNMENT 1

EXPLORING AN OPENSOURCE SOFTWARE (WORDPRESS)

Submitted by: M. Hasnain Naeem

Reg #: 212728

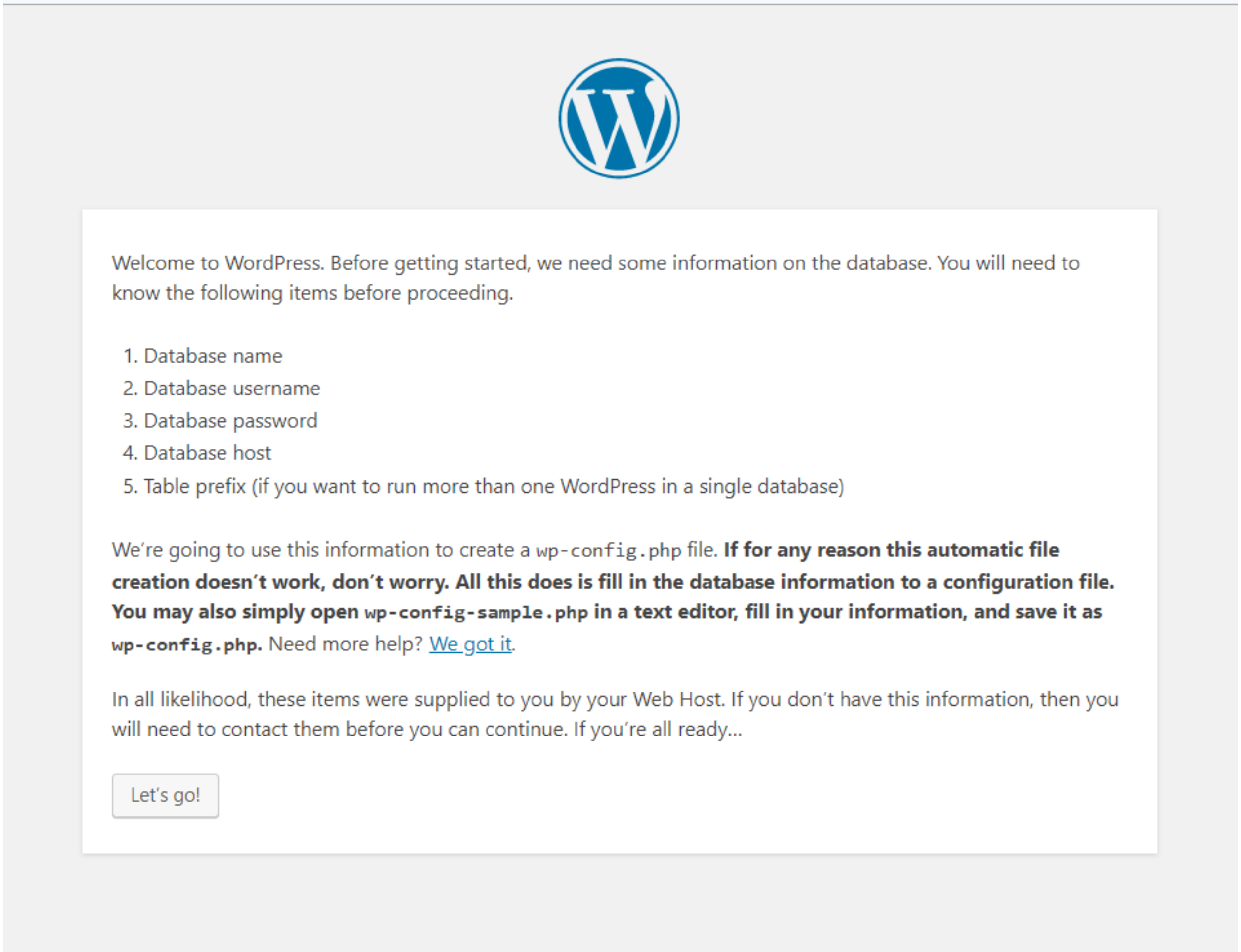
Section: 7B

Submitted to: Dr. Sidra Sultana

1 CONTENTS

2 USER'S PERSPECTIVE: HOW ADMIN PANEL IS AFFECTING THE LOOK & FEEL OF WEB

2.1 SETUP

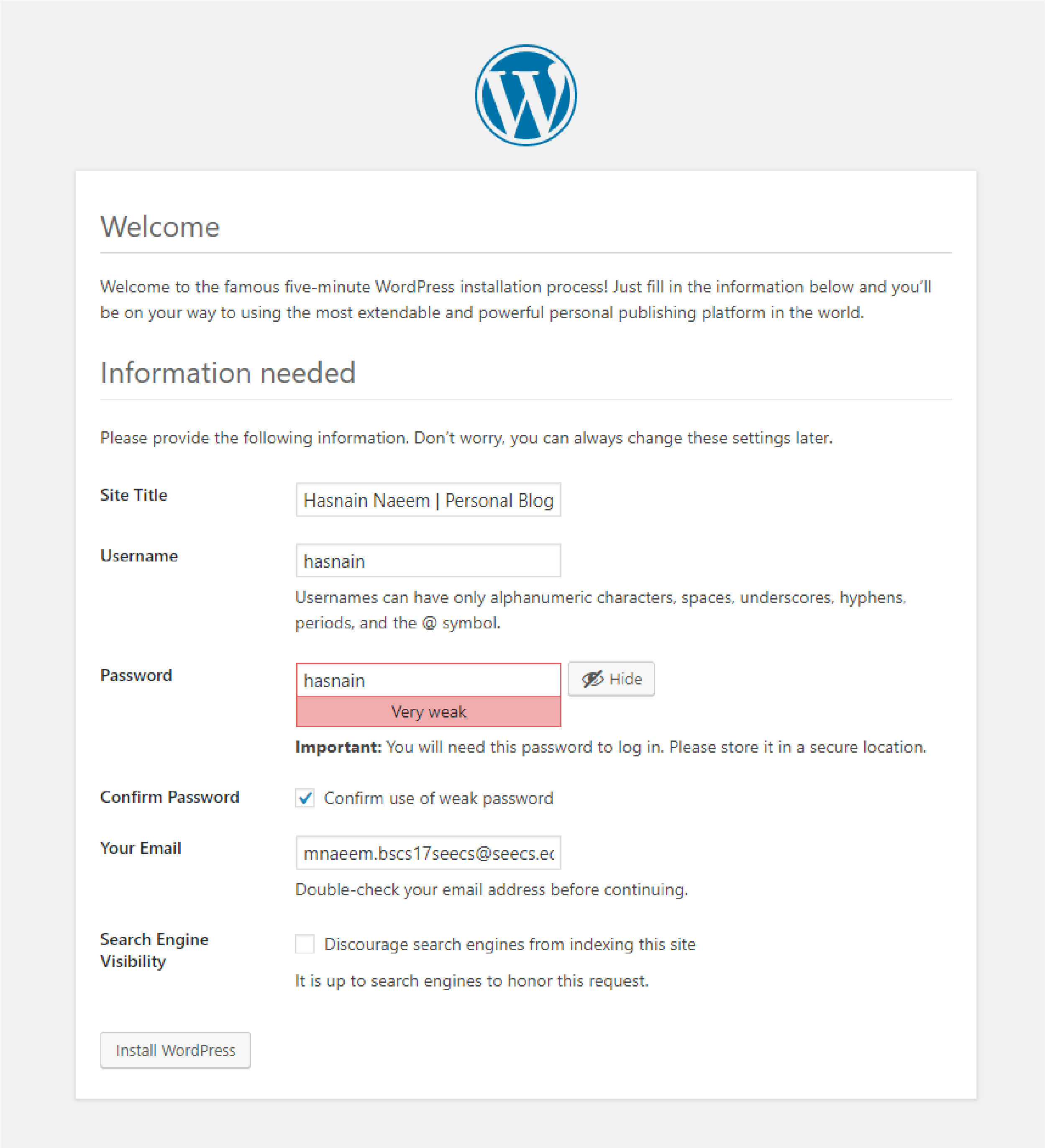


Welcome to WordPress. Before getting started, we need some information on the database. You will need to know the following items before proceeding.

1. Database name
2. Database username
3. Database password
4. Database host
5. Table prefix (if you want to run more than one WordPress in a single database)

We're going to use this information to create a `wp-config.php` file. **If for any reason this automatic file creation doesn't work, don't worry. All this does is fill in the database information to a configuration file. You may also simply open `wp-config-sample.php` in a text editor, fill in your information, and save it as `wp-config.php`.** Need more help? We got it.

In all likelihood, these items were supplied to you by your Web Host. If you don't have this information, then you will need to contact them before you can continue. If you're all ready…



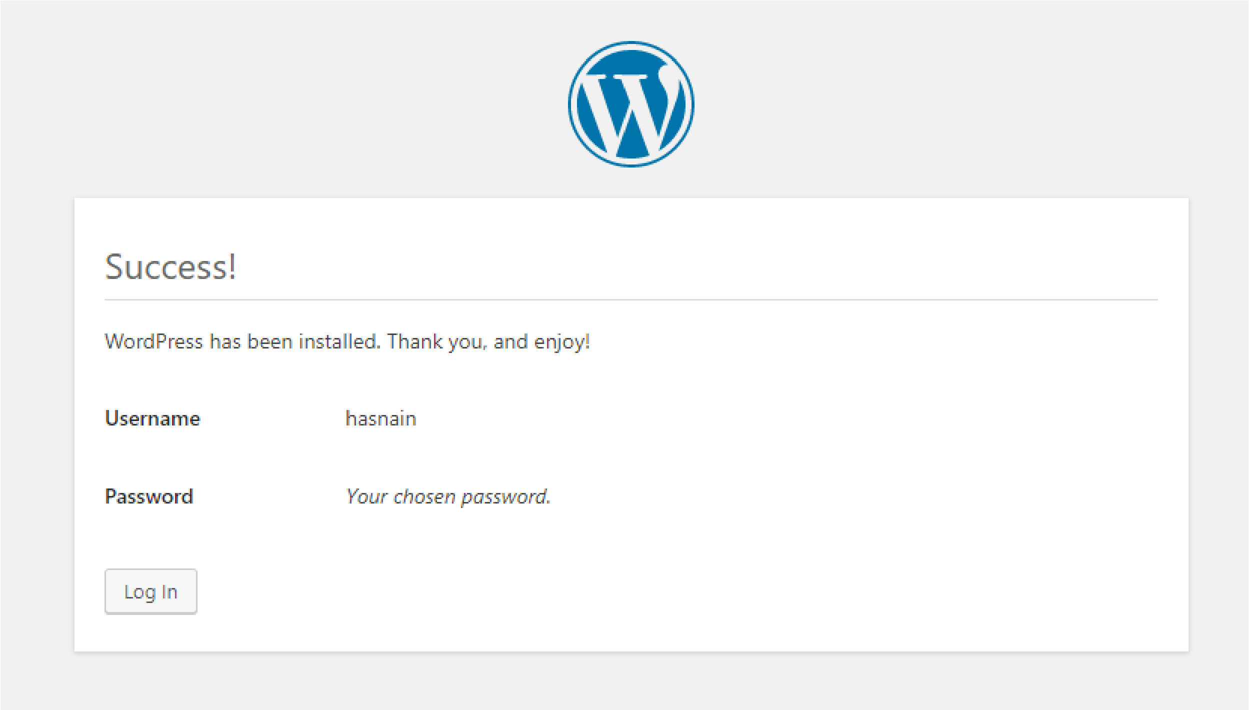
Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Don't worry, you can always change these settings later.

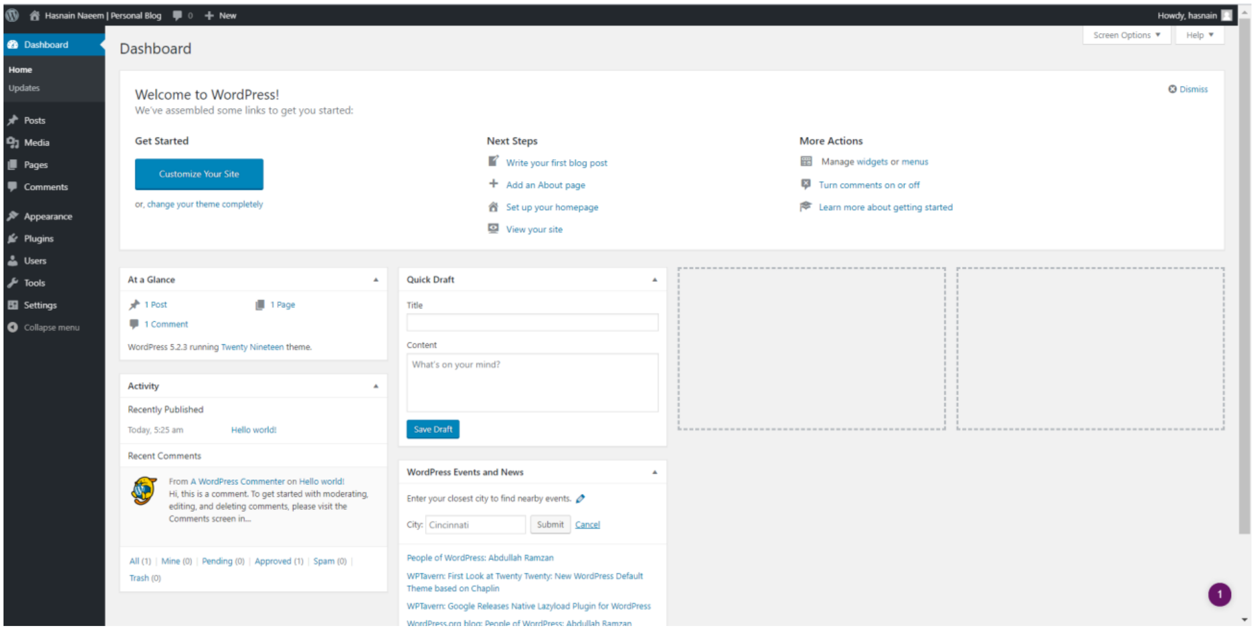
Site Title	Hasnain Naeem | Personal Blog
Username	hasnain Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.
Password	hasnain Very weak **Important:** You will need this password to log in. Please store it in a secure location.
Confirm Password	☑ Confirm use of weak password
Your Email	mnaeem.bscs17seecs@seecs.ec Double-check your email address before continuing.
Search Engine Visibility	□ Discourage search engines from indexing this site It is up to search engines to honor this request.



Success!

WordPress has been installed. Thank you, and enjoy!

Username	hasnain
Password	*Your chosen password.*



Dashboard

Welcome to WordPress!

We've assembled some links to get you started:

Get Started

or, change your theme completely

Next Steps

- Write your first blog post
- Add an About page
- Set up your homepage
- View your site

More Actions

- Manage widgets or menus
- Turn comments on or off
- Learn more about getting started

At a Glance

1 Post
1 Page
1 Comment

WordPress 5.2.3 running Twenty Nineteen theme.

Activity

Recently Published

Today, 5:25 am Hello world!

Recent Comments

From A WordPress Commenter on Hello world!
Hi, this is a comment. To get started with moderating, editing, and deleting comments, please visit the Comments screen in…

Quick Draft

Title

Content

What's on your mind?

WordPress Events and News

Enter your closest city to find nearby events.

City: Cincinnati

People of WordPress: Abdullah Ramzan

WPTavern: First Look at Twenty Twenty: New WordPress Default Theme based on Chaplin

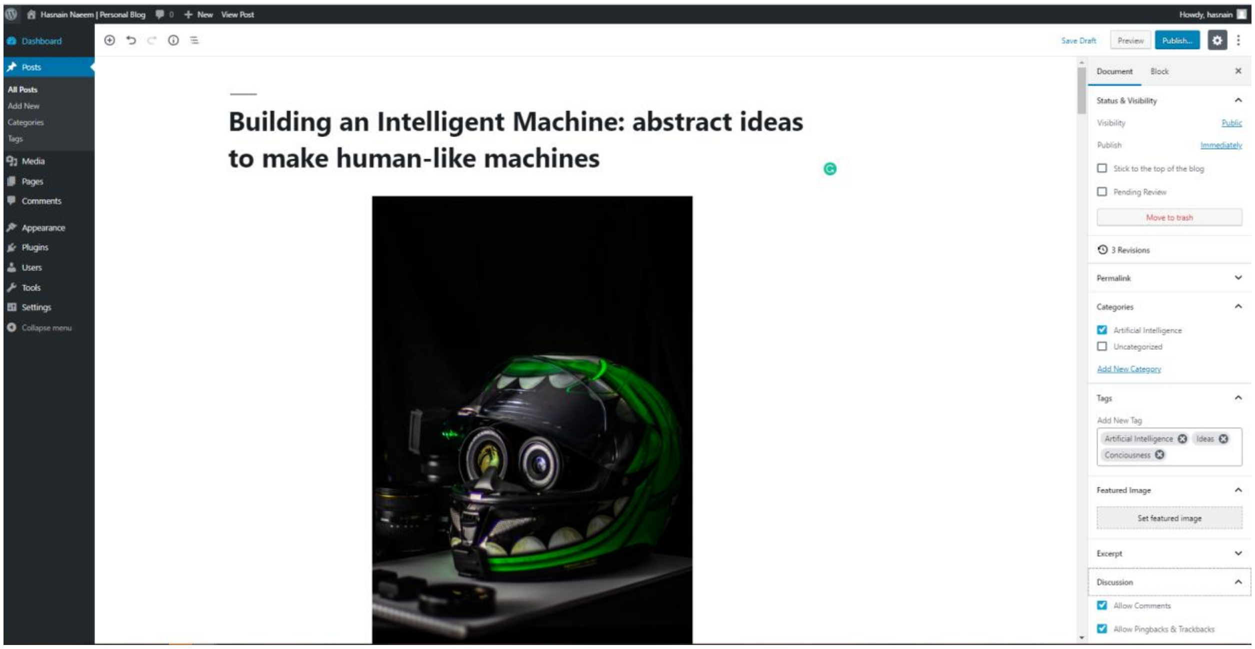
WPTavern: Google Releases Native Lazyload Plugin for WordPress

WordPress.org blog: People of WordPress: Abdullah Ramzan

2.2 Exploration of Features

2.2.1 Posts Section

Writing a Blog Post



Building an Intelligent Machine: abstract ideas to make human-like machines

Status & Visibility

Visibility: Public

Publish: Immediately

☐ Stick to the top of the blog

☐ Pending Review

Categories

☑ Artificial Intelligence

☐ Uncategorized

Tags

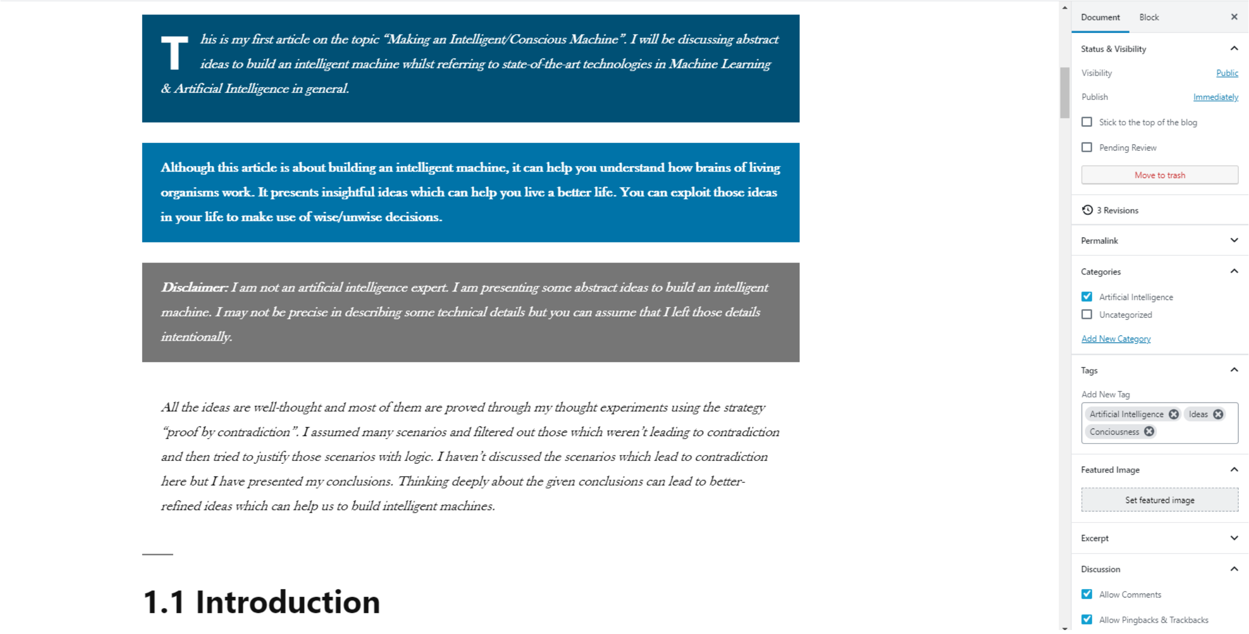
Add New Tag: Artificial Intelligence, Ideas, Conciousness

Featured Image

Discussion

☑ Allow Comments

☑ Allow Pingbacks & Trackbacks



This is my first article on the topic "Making an Intelligent/Conscious Machine". I will be discussing abstract ideas to build an intelligent machine whilst referring to state-of-the-art technologies in Machine Learning & Artificial Intelligence in general.

Although this article is about building an intelligent machine, it can help you understand how brains of living organisms work. It presents insightful ideas which can help you live a better life. You can exploit those ideas in your life to make use of wise/unwise decisions.

Disclaimer: *I am not an artificial intelligence expert. I am presenting some abstract ideas to build an intelligent machine. I may not be precise in describing some technical details but you can assume that I left those details intentionally.*

All the ideas are well-thought and most of them are proved through my thought experiments using the strategy "proof by contradiction". I assumed many scenarios and filtered out those which weren't leading to contradiction and then tried to justify those scenarios with logic. I haven't discussed the scenarios which lead to contradiction here but I have presented my conclusions. Thinking deeply about the given conclusions can lead to better-refined ideas which can help us to build intelligent machines.

1.1 Introduction

Status & Visibility

Visibility: Public

Publish: Immediately

☐ Stick to the top of the blog

☐ Pending Review

Categories

☑ Artificial Intelligence

☐ Uncategorized

Tags

Add New Tag: Artificial Intelligence, Ideas, Conciousness

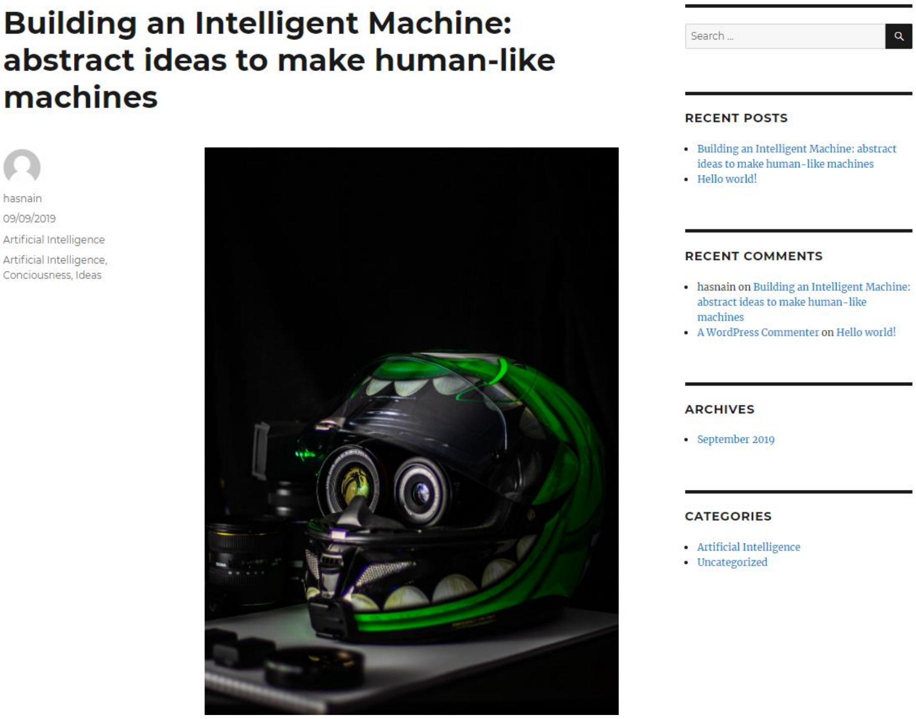
Featured Image

Discussion

☑ Allow Comments

☑ Allow Pingbacks & Trackbacks

Published Blog Post



Building an Intelligent Machine: abstract ideas to make human-like machines

hasnain

09/09/2019

Artificial Intelligence

Artificial Intelligence, Conciousness, Ideas

RECENT POSTS

- Building an Intelligent Machine: abstract ideas to make human-like machines
- Hello world!

RECENT COMMENTS

- hasnain on Building an Intelligent Machine: abstract ideas to make human-like machines
- A WordPress Commenter on Hello world!

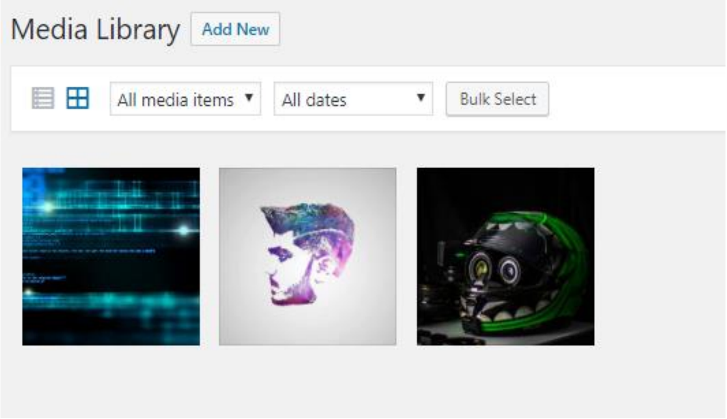
ARCHIVES

- September 2019

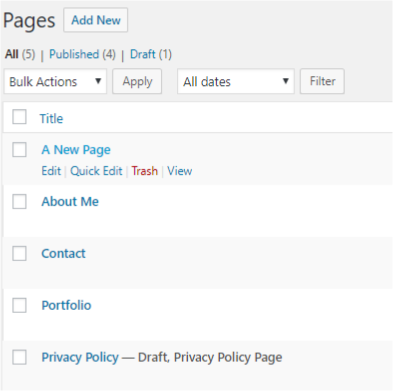
CATEGORIES

- Artificial Intelligence
- Uncategorized

2.2.2 Media Section



2.2.3 Pages Section


Pages
Add New
All (5) | Published (4) | Draft (1)
Bulk Actions
Apply
All dates
Filter
Edit | Quick Edit | Trash | View

☐ Title

☐ A New Page

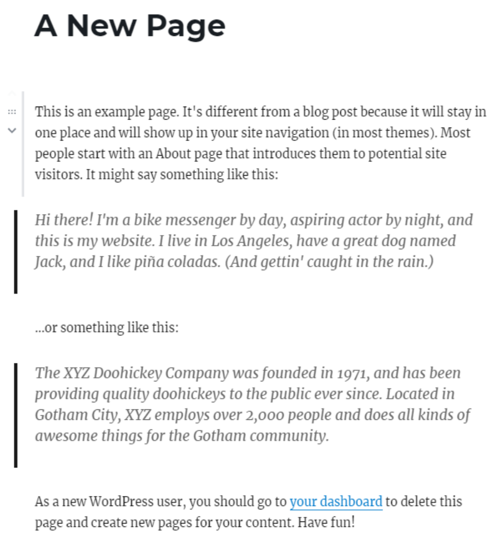
☐ About Me

☐ Contact

☐ Portfolio

☐ Privacy Policy — Draft, Privacy Policy Page

Adding a New Page



A New Page

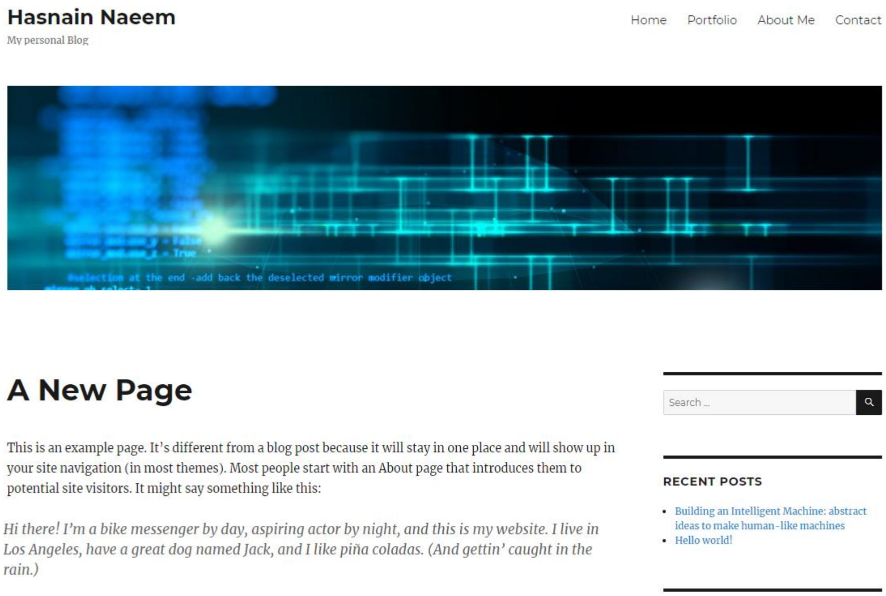
This is an example page. It's different from a blog post because it will stay in one place and will show up in your site navigation (in most themes). Most people start with an About page that introduces them to potential site visitors. It might say something like this:

> *Hi there! I'm a bike messenger by day, aspiring actor by night, and this is my website. I live in Los Angeles, have a great dog named Jack, and I like piña coladas. (And gettin' caught in the rain.)*

...or something like this:

> *The XYZ Doohickey Company was founded in 1971, and has been providing quality doohickeys to the public ever since. Located in Gotham City, XYZ employs over 2,000 people and does all kinds of awesome things for the Gotham community.*

As a new WordPress user, you should go to your dashboard to delete this page and create new pages for your content. Have fun!



A New Page

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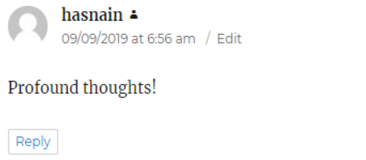
> *Hi there! I'm a bike messenger by day, aspiring actor by night, and this is my website. I live in Los Angeles, have a great dog named Jack, and I like piña coladas. (And gettin' caught in the rain.)*

2.2.4 Comments Section

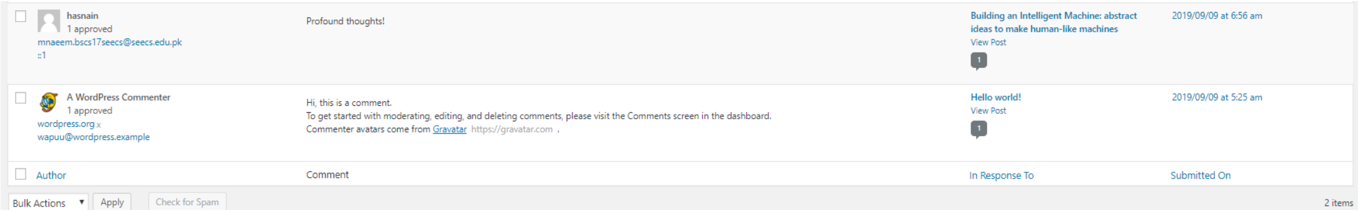
Commenting under a post



hasnain
09/09/2019 at 6:56 am / Edit

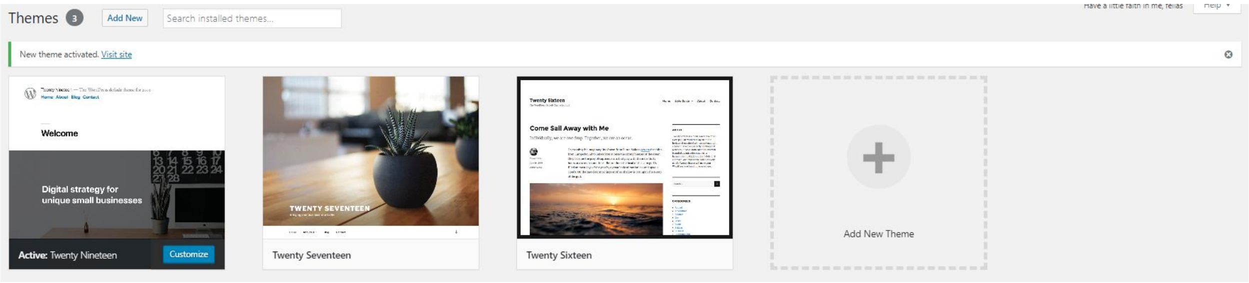
Profound thoughts!

Reviewing comments on Admin Panel



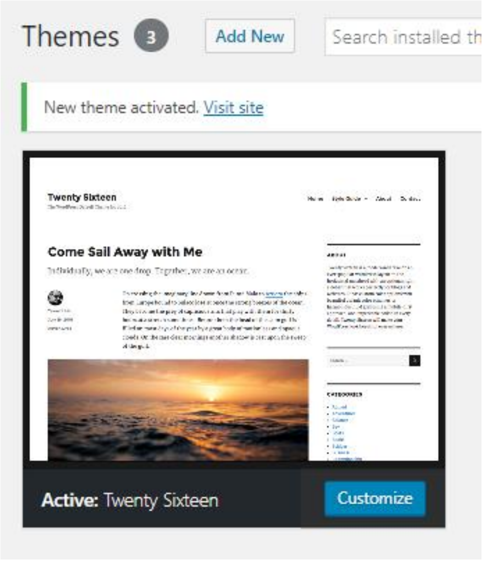
□ Author	Comment	In Response To	Submitted On
□ hasnain 1 approved mnaeem.bscs17seecs@seecs.edu.pk ::1	Profound thoughts!	Building an Intelligent Machine: abstract ideas to make human-like machines View Post 1	2019/09/09 at 6:56 am
□ A WordPress Commenter 1 approved wordpress.org x wapuu@wordpress.example	Hi, this is a comment. To get started with moderating, editing, and deleting comments, please visit the Comments screen in the dashboard. Commenter avatars come from Gravatar https://gravatar.com .	Hello world! View Post 1	2019/09/09 at 5:25 am

2.2.5 Themes Section



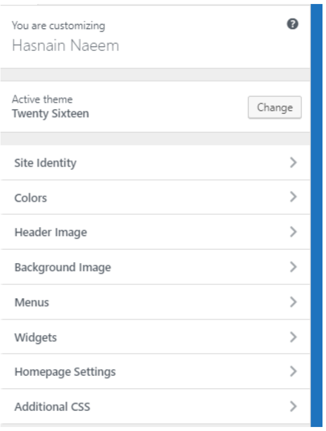
New theme activated. Visit site

Changed Theme



New theme activated. Visit site

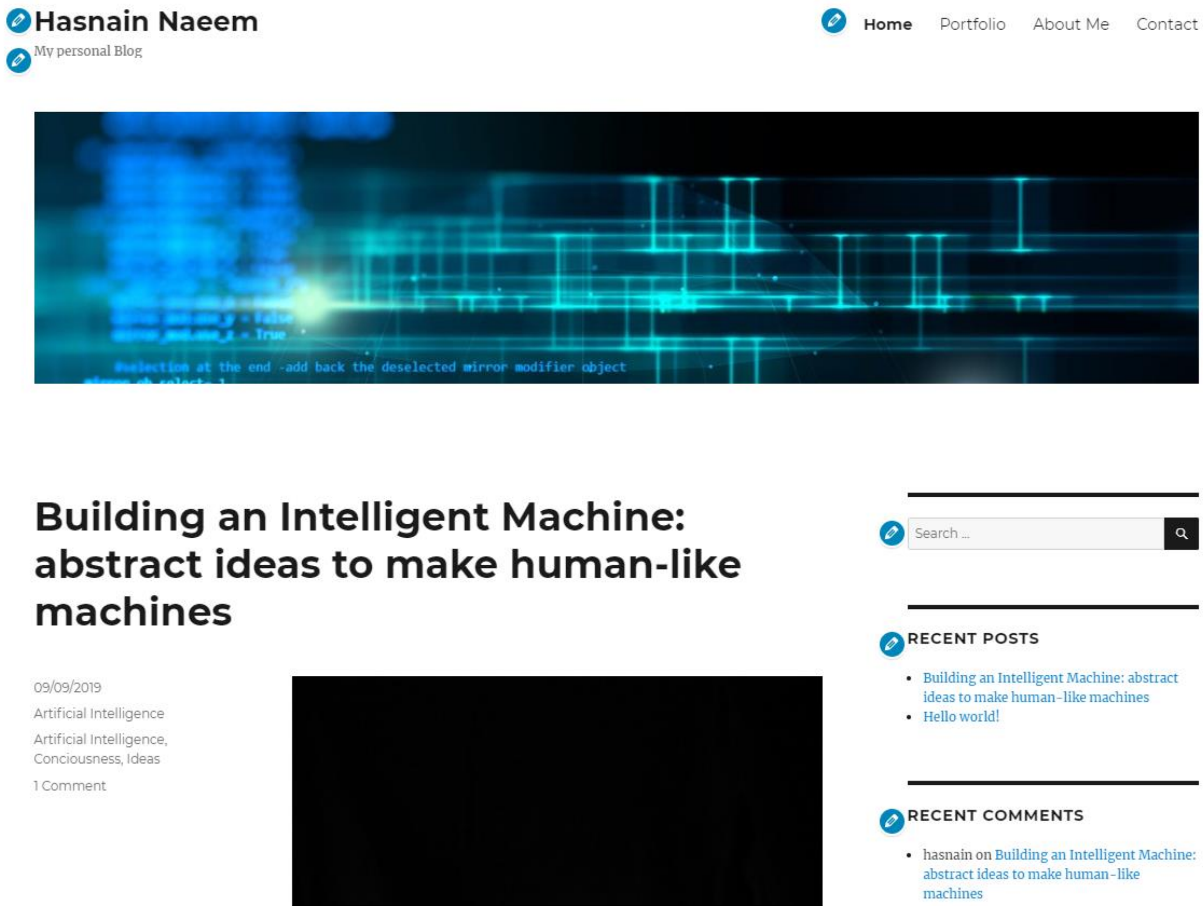
2.2.6 Customization Options



You are customizing
Hasnain Naeem

Active theme
Twenty Sixteen

After Customization



Home
Portfolio
About Me
Contact

Hasnain Naeem
My personal Blog

#selection at the end -add back the deselected mirror modifier object

Building an Intelligent Machine: abstract ideas to make human-like machines

09/09/2019
Artificial Intelligence
Artificial Intelligence, Conciousness, Ideas
1 Comment

RECENT POSTS

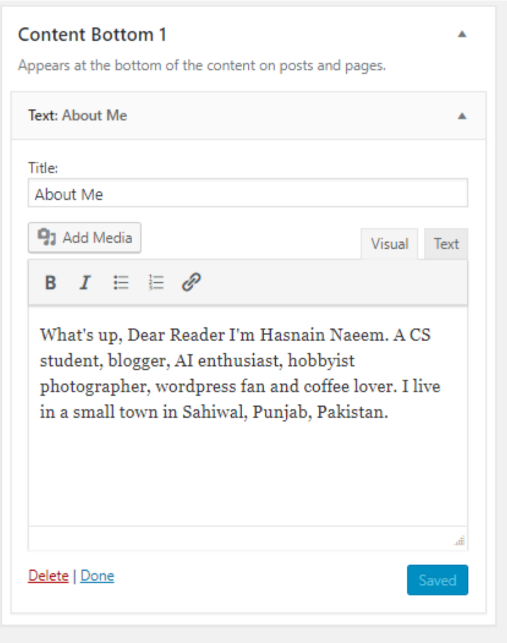
- Building an Intelligent Machine: abstract ideas to make human-like machines
- Hello world!

RECENT COMMENTS

- hasnain on Building an Intelligent Machine: abstract ideas to make human-like machines

2.2.7 Widgets Section

Adding a widget under posts/pages



Content Bottom 1

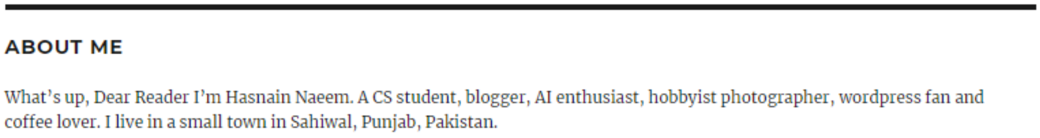
Appears at the bottom of the content on posts and pages.

Text: About Me

Title: About Me

What's up, Dear Reader I'm Hasnain Naeem. A CS student, blogger, AI enthusiast, hobbyist photographer, wordpress fan and coffee lover. I live in a small town in Sahiwal, Punjab, Pakistan.

Preview of added widget

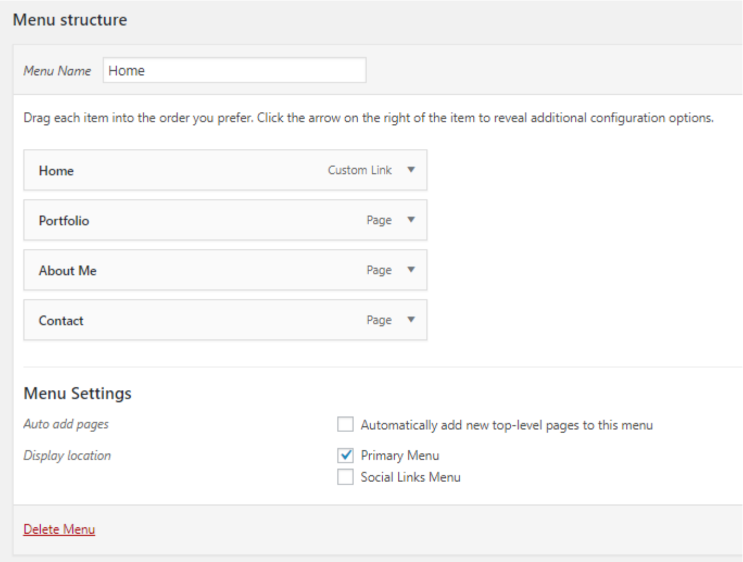


ABOUT ME

What's up, Dear Reader I'm Hasnain Naeem. A CS student, blogger, AI enthusiast, hobbyist photographer, wordpress fan and coffee lover. I live in a small town in Sahiwal, Punjab, Pakistan.

2.2.8 Menus Section

Adding a primary menu



Menu structure

Menu Name: Home

Drag each item into the order you prefer. Click the arrow on the right of the item to reveal additional configuration options.

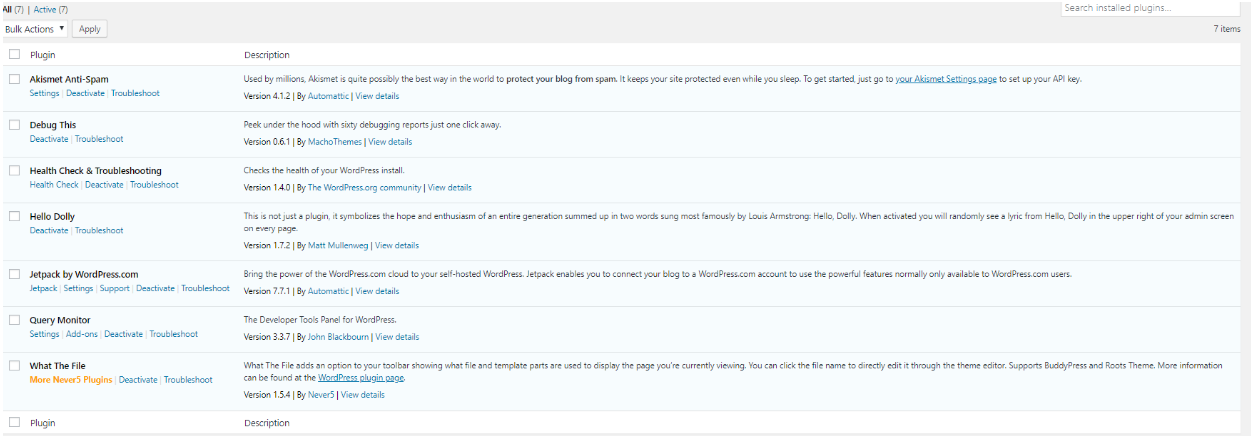
Home	Custom Link ▼
Portfolio	Page ▼
About Me	Page ▼
Contact	Page ▼

Menu Settings

Auto add pages: □ Automatically add new top-level pages to this menu

Display location: ☑ Primary Menu
□ Social Links Menu

2.2.9 Plugins Section



All (7) | Active (7)

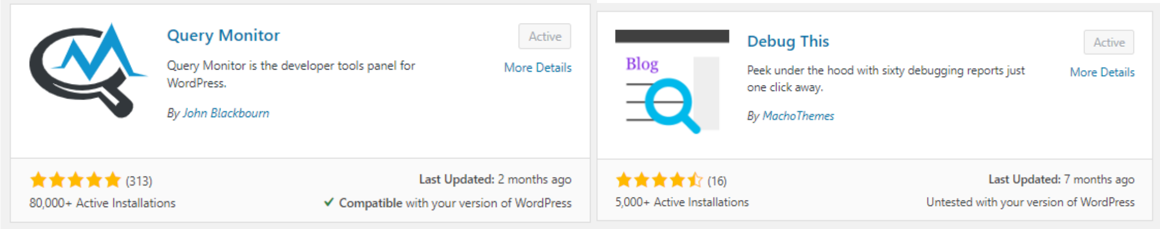
Bulk Actions ▾ | Apply

Search installed plugins...

7 items

□ Plugin	Description
□ **Akismet Anti-Spam** Settings | Deactivate | Troubleshoot	Used by millions, Akismet is quite possibly the best way in the world to **protect your blog from spam.** It keeps your site protected even while you sleep. To get started, just go to your Akismet Settings page to set up your API key. Version 4.1.2 | By Automattic | View details
□ **Debug This** Deactivate | Troubleshoot	Peek under the hood with sixty debugging reports just one click away. Version 0.6.1 | By MachoThemes | View details
□ **Health Check & Troubleshooting** Health Check | Deactivate | Troubleshoot	Checks the health of your WordPress install. Version 1.4.0 | By The WordPress.org community | View details
□ **Hello Dolly** Deactivate | Troubleshoot	This is not just a plugin, it symbolizes the hope and enthusiasm of an entire generation summed up in two words sung most famously by Louis Armstrong: Hello, Dolly. When activated you will randomly see a lyric from Hello, Dolly in the upper right of your admin screen on every page. Version 1.7.2 | By Matt Mullenweg | View details
□ **Jetpack by WordPress.com** Jetpack | Settings | Support | Deactivate | Troubleshoot	Bring the power of the WordPress.com cloud to your self-hosted WordPress. Jetpack enables you to connect your blog to a WordPress.com account to use the powerful features normally only available to WordPress.com users. Version 7.7.1 | By Automattic | View details
□ **Query Monitor** Settings | Add-ons | Deactivate | Troubleshoot	The Developer Tools Panel for WordPress. Version 3.3.7 | By John Blackbourn | View details
□ **What The File** More Never5 Plugins | Deactivate | Troubleshoot	What The File adds an option to your toolbar showing what file and template parts are used to display the page you're currently viewing. You can click the file name to directly edit it through the theme editor. Supports BuddyPress and Roots Theme. More information can be found at the WordPress plugin page. Version 1.5.4 | By Never5 | View details
□ Plugin	Description

2.2.10 Exploring and installing new plugins



Query Monitor

Query Monitor is the developer tools panel for WordPress.

By John Blackbourn

Active | More Details

★★★★★ (313)

80,000+ Active Installations

Last Updated: 2 months ago

✓ **Compatible** with your version of WordPress

Debug This

Peek under the hood with sixty debugging reports just one click away.

By MachoThemes

Active | More Details

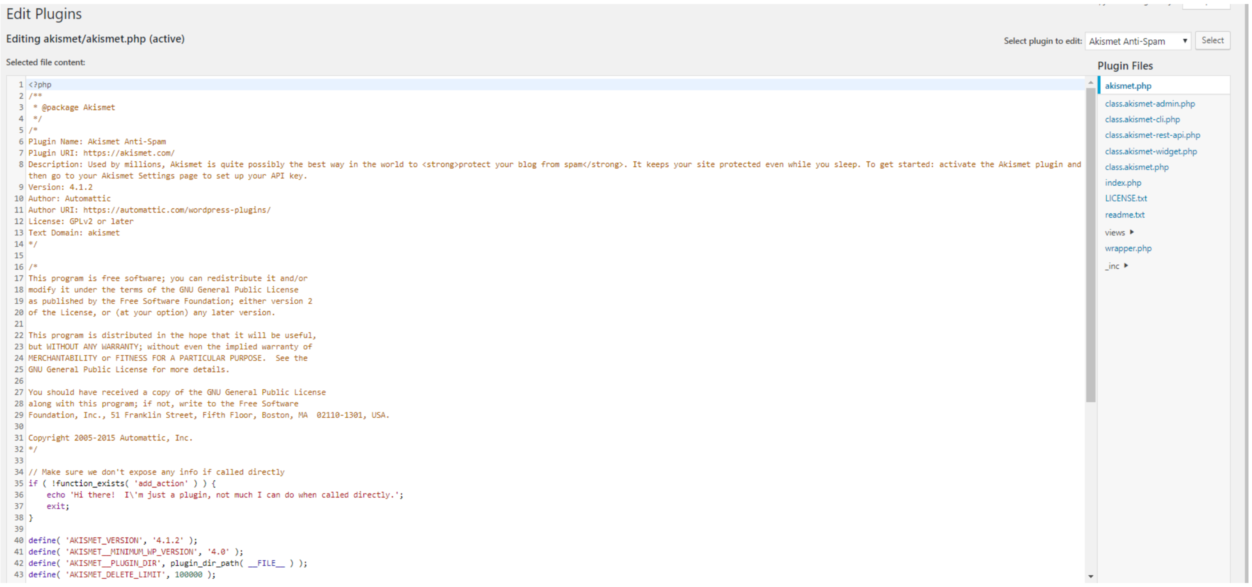
★★★★½ (16)

5,000+ Active Installations

Last Updated: 7 months ago

Untested with your version of WordPress

2.2.11 Editing Plugin



Edit Plugins

Editing akismet/akismet.php (active)

Select plugin to edit: Akismet Anti-Spam ▾ | Select

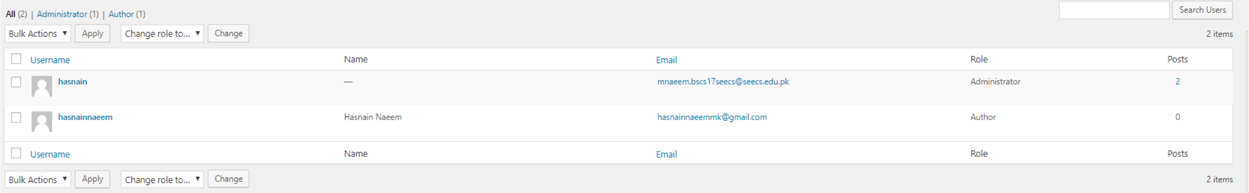
Selected file content:

```php
<?php
/**
 * @package Akismet
 */
/*
Plugin Name: Akismet Anti-Spam
Plugin URI: https://akismet.com/
Description: Used by millions, Akismet is quite possibly the best way in the world to <strong>protect your blog from spam</strong>. It keeps your site protected even while you sleep. To get started: activate the Akismet plugin and then go to your Akismet Settings page to set up your API key.
Version: 4.1.2
Author: Automattic
Author URI: https://automattic.com/wordpress-plugins/
License: GPLv2 or later
Text Domain: akismet
*/

/*
This program is free software; you can redistribute it and/or
modify it under the terms of the GNU General Public License
as published by the Free Software Foundation; either version 2
of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
GNU General Public License for more details.

You should have received a copy of the GNU General Public License
along with this program; if not, write to the Free Software
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA  02110-1301, USA.

Copyright 2005-2015 Automattic, Inc.
*/

// Make sure we don't expose any info if called directly
if ( !function_exists( 'add_action' ) ) {
	echo 'Hi there!  I\'m just a plugin, not much I can do when called directly.';
	exit;
}

define( 'AKISMET_VERSION', '4.1.2' );
define( 'AKISMET__MINIMUM_WP_VERSION', '4.0' );
define( 'AKISMET__PLUGIN_DIR', plugin_dir_path( __FILE__ ) );
define( 'AKISMET_DELETE_LIMIT', 100000 );
```

Plugin Files

- akismet.php
- class.akismet-admin.php
- class.akismet-cli.php
- class.akismet-rest-api.php
- class.akismet-widget.php
- class.akismet.php
- index.php
- LICENSE.txt
- readme.txt
- views ▸
- wrapper.php
- _inc ▸

2.2.12 Users Section



All (2) | Administrator (1) | Author (1)

Bulk Actions ▾ | Apply | Change role to... ▾ | Change

Search Users

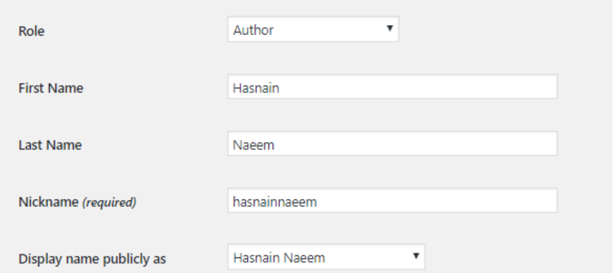
2 items

□ Username	Name	Email	Role	Posts
□ **hasnain**	—	mnaeem.bscs17seecs@seecs.edu.pk	Administrator	2
□ **hasnainnaeem**	Hasnain Naeem	hasnainnaeemmk@gmail.com	Author	0
□ Username	Name	Email	Role	Posts

Bulk Actions ▾ | Apply | Change role to... ▾ | Change

2 items

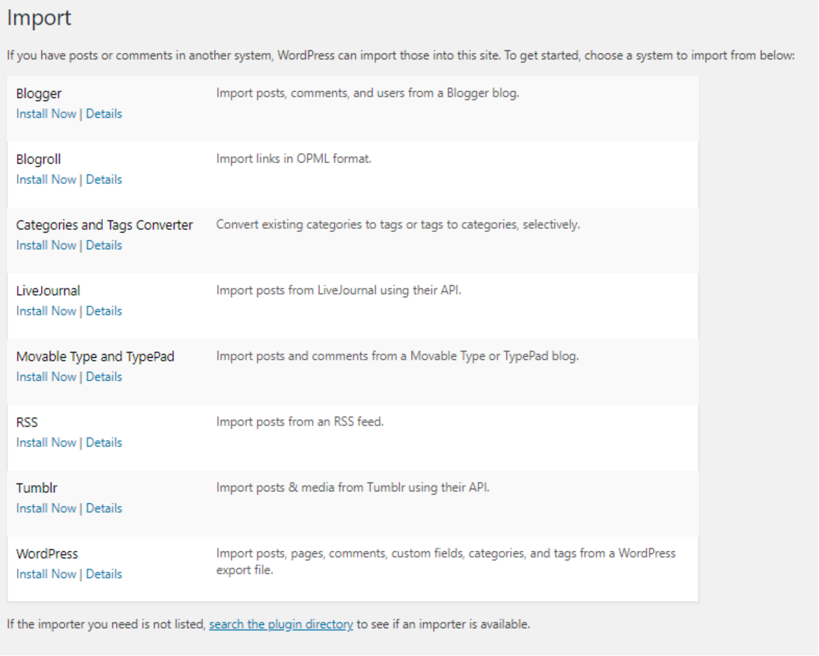
Added another account as author to use it from less secure devices



Role	Author ▾
First Name	Hasnain
Last Name	Naeem
Nickname *(required)*	hasnainnaeem
Display name publicly as	Hasnain Naeem ▾

2.2.13 Tools

Import Tool



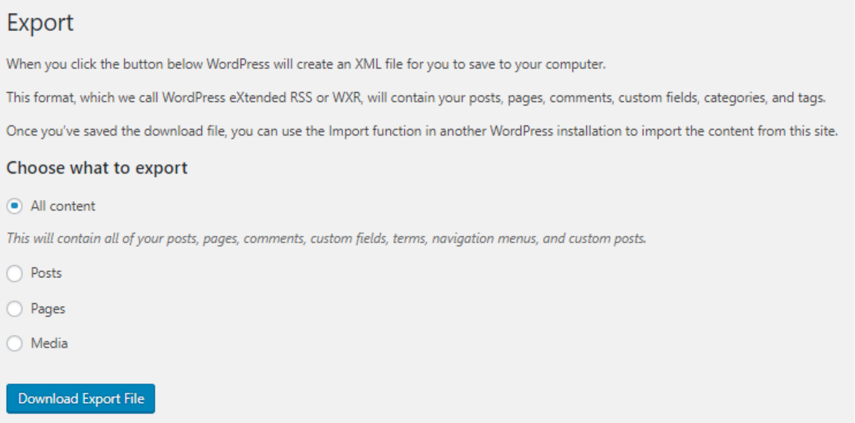
Import

If you have posts or comments in another system, WordPress can import those into this site. To get started, choose a system to import from below:

Blogger Install Now | Details	Import posts, comments, and users from a Blogger blog.
Blogroll Install Now | Details	Import links in OPML format.
Categories and Tags Converter Install Now | Details	Convert existing categories to tags or tags to categories, selectively.
LiveJournal Install Now | Details	Import posts from LiveJournal using their API.
Movable Type and TypePad Install Now | Details	Import posts and comments from a Movable Type or TypePad blog.
RSS Install Now | Details	Import posts from an RSS feed.
Tumblr Install Now | Details	Import posts & media from Tumblr using their API.
WordPress Install Now | Details	Import posts, pages, comments, custom fields, categories, and tags from a WordPress export file.

If the importer you need is not listed, search the plugin directory to see if an importer is available.

Export Tool



Export

When you click the button below WordPress will create an XML file for you to save to your computer.

This format, which we call WordPress eXtended RSS or WXR, will contain your posts, pages, comments, custom fields, categories, and tags.

Once you've saved the download file, you can use the Import function in another WordPress installation to import the content from this site.

Choose what to export

● All content

This will contain all of your posts, pages, comments, custom fields, terms, navigation menus, and custom posts.

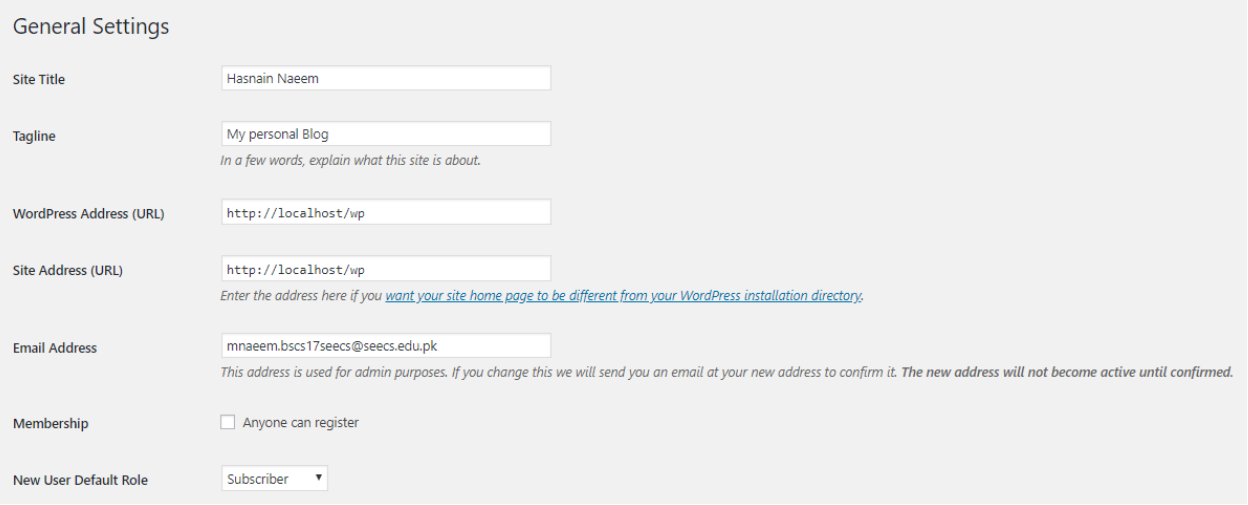
○ Posts

○ Pages

○ Media

2.2.14 Other Settings

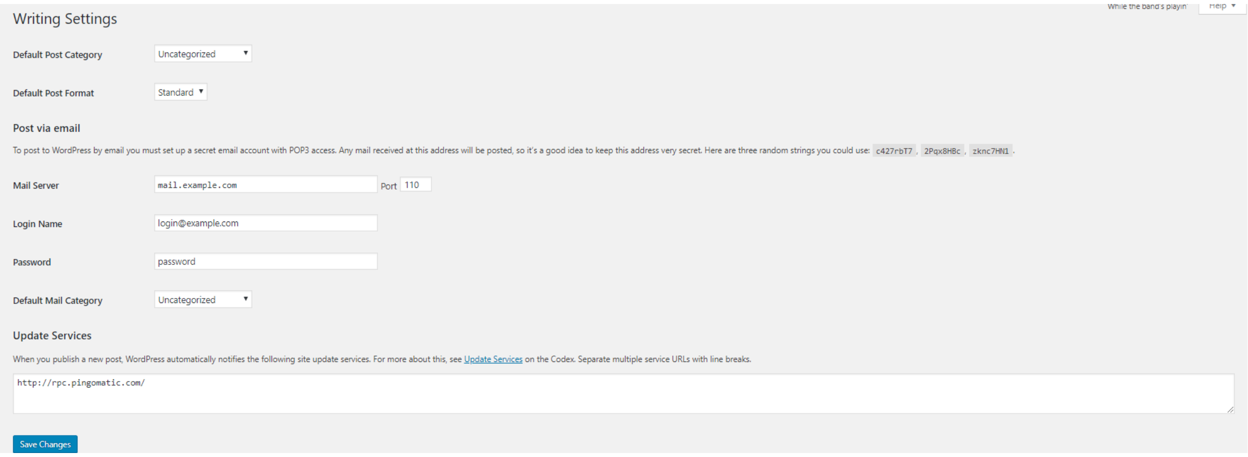
General



General Settings

Site Title	Hasnain Naeem
Tagline	My personal Blog *In a few words, explain what this site is about.*
WordPress Address (URL)	http://localhost/wp
Site Address (URL)	http://localhost/wp *Enter the address here if you want your site home page to be different from your WordPress installation directory.*
Email Address	mnaeem.bscs17seecs@seecs.edu.pk *This address is used for admin purposes. If you change this we will send you an email at your new address to confirm it. **The new address will not become active until confirmed.***
Membership	□ Anyone can register
New User Default Role	Subscriber ▼

Writing via Email



Writing Settings

Default Post Category	Uncategorized ▼
Default Post Format	Standard ▼

Post via email

To post to WordPress by email you must set up a secret email account with POP3 access. Any mail received at this address will be posted, so it's a good idea to keep this address very secret. Here are three random strings you could use: `c427rbT7`, `2Pqx8HBc`, `zknc7HN1`.

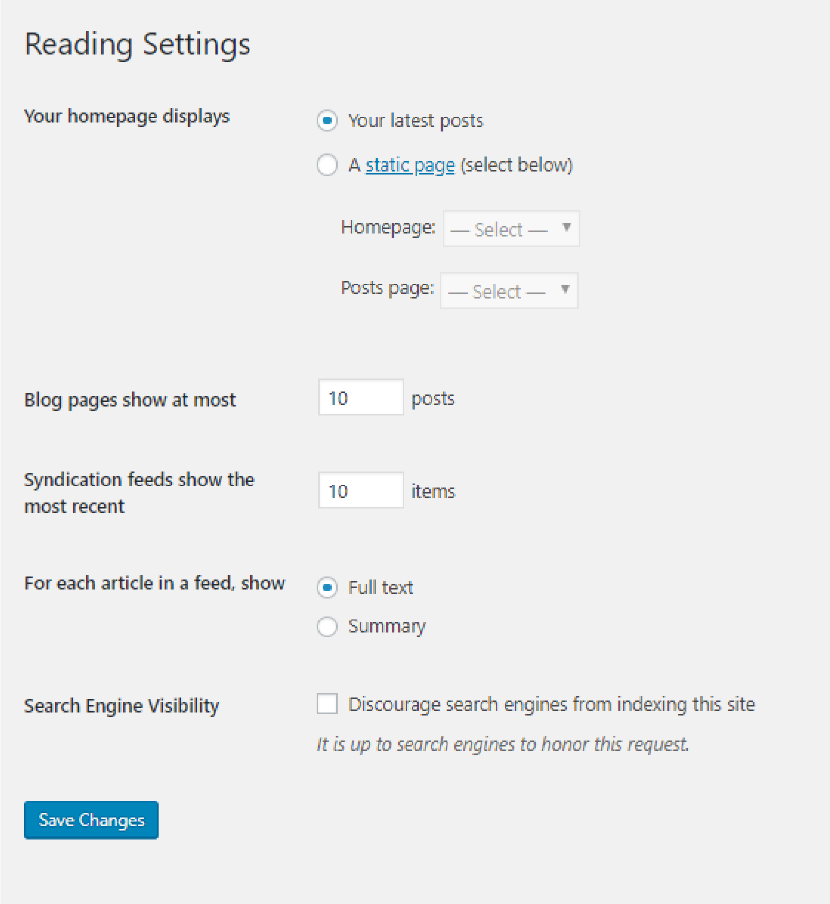
Mail Server	mail.example.com Port 110
Login Name	login@example.com
Password	password
Default Mail Category	Uncategorized ▼

Update Services

When you publish a new post, WordPress automatically notifies the following site update services. For more about this, see Update Services on the Codex. Separate multiple service URLs with line breaks.

```
http://rpc.pingomatic.com/
```

Reading & Posts Settings



Reading Settings

Your homepage displays

● Your latest posts

○ A static page (select below)

Homepage: — Select —

Posts page: — Select —

Blog pages show at most 10 posts

Syndication feeds show the most recent 10 items

For each article in a feed, show

● Full text

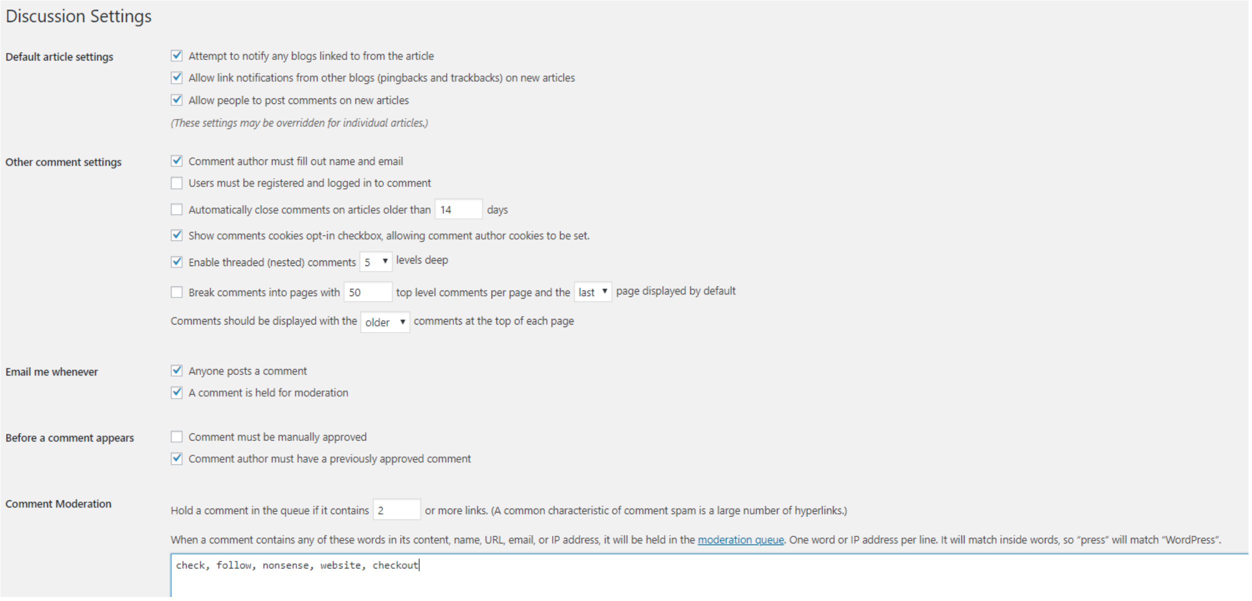
○ Summary

Search Engine Visibility

□ Discourage search engines from indexing this site

It is up to search engines to honor this request.

Discussion Settings



Discussion Settings

Default article settings

☑ Attempt to notify any blogs linked to from the article

☑ Allow link notifications from other blogs (pingbacks and trackbacks) on new articles

☑ Allow people to post comments on new articles

(These settings may be overridden for individual articles.)

Other comment settings

☑ Comment author must fill out name and email

□ Users must be registered and logged in to comment

□ Automatically close comments on articles older than 14 days

☑ Show comments cookies opt-in checkbox, allowing comment author cookies to be set.

☑ Enable threaded (nested) comments 5 levels deep

□ Break comments into pages with 50 top level comments per page and the last page displayed by default

Comments should be displayed with the older comments at the top of each page

Email me whenever

☑ Anyone posts a comment

☑ A comment is held for moderation

Before a comment appears

□ Comment must be manually approved

☑ Comment author must have a previously approved comment

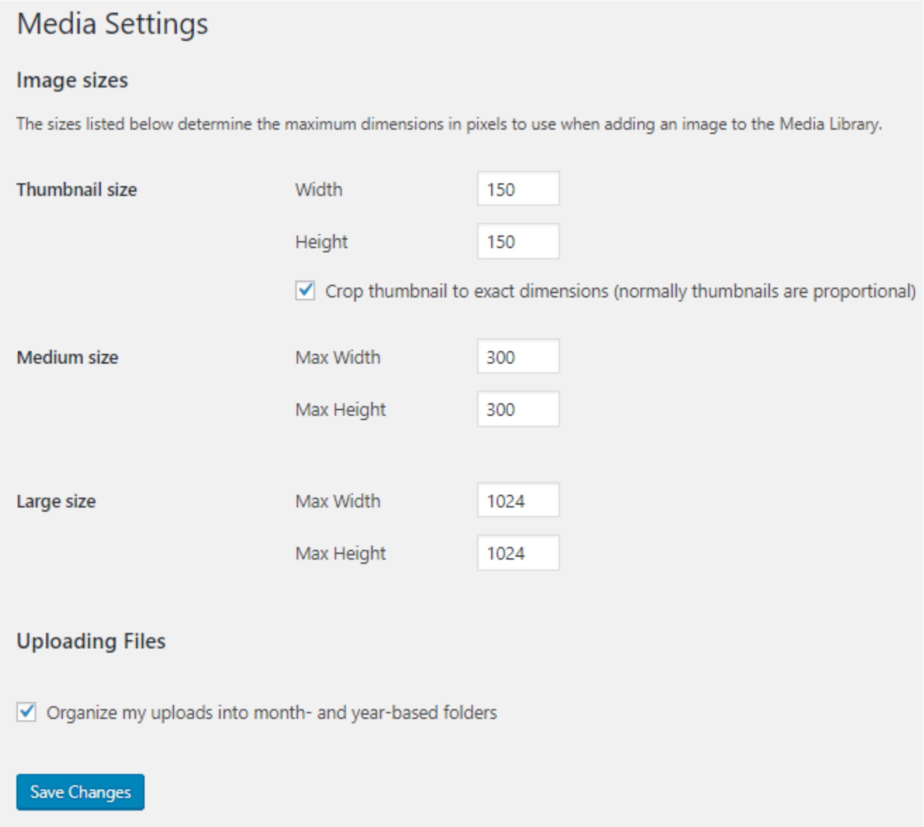
Comment Moderation

Hold a comment in the queue if it contains 2 or more links. (A common characteristic of comment spam is a large number of hyperlinks.)

When a comment contains any of these words in its content, name, URL, email, or IP address, it will be held in the moderation queue. One word or IP address per line. It will match inside words, so "press" will match "WordPress".

```
check, follow, nonsense, website, checkout
```

Media Settings: chaning default resolution of images



Media Settings

Image sizes

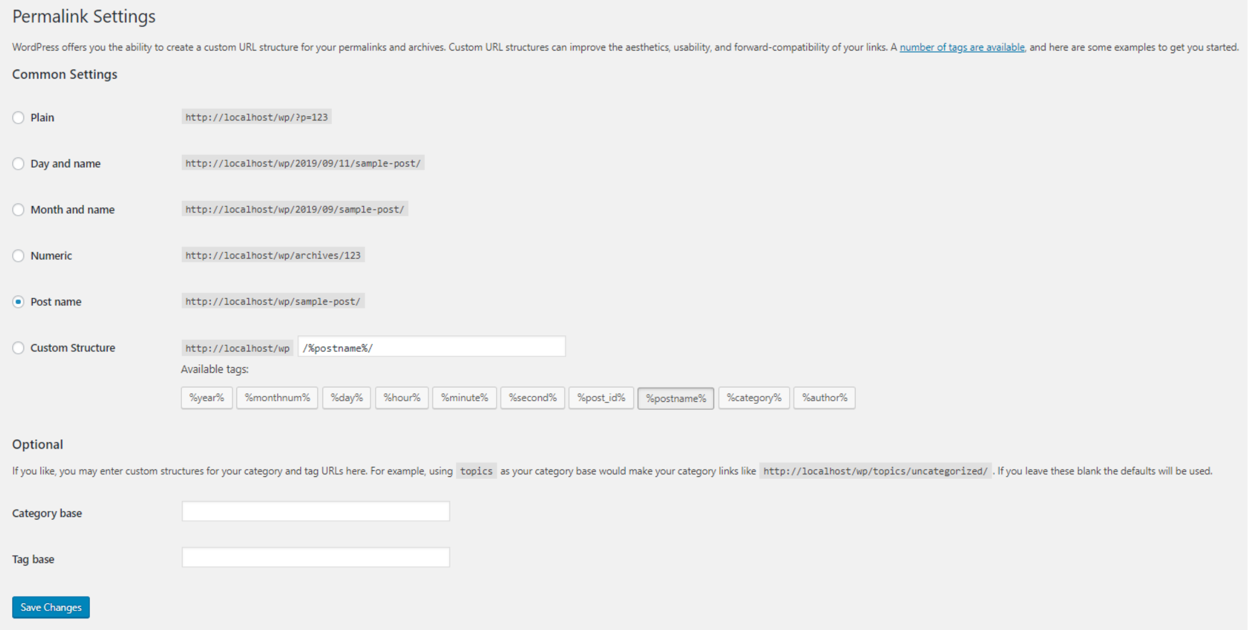
The sizes listed below determine the maximum dimensions in pixels to use when adding an image to the Media Library.

Thumbnail size	Width	150
	Height	150
	☑ Crop thumbnail to exact dimensions (normally thumbnails are proportional)	
Medium size	Max Width	300
	Max Height	300
Large size	Max Width	1024
	Max Height	1024

Uploading Files

☑ Organize my uploads into month- and year-based folders

Permalink Settings: changing default link structure



Permalink Settings

WordPress offers you the ability to create a custom URL structure for your permalinks and archives. Custom URL structures can improve the aesthetics, usability, and forward-compatibility of your links. A number of tags are available, and here are some examples to get you started.

Common Settings

○ Plain	`http://localhost/wp/?p=123`
○ Day and name	`http://localhost/wp/2019/09/11/sample-post/`
○ Month and name	`http://localhost/wp/2019/09/sample-post/`
○ Numeric	`http://localhost/wp/archives/123`
● Post name	`http://localhost/wp/sample-post/`
○ Custom Structure	`http://localhost/wp` `/%postname%/`

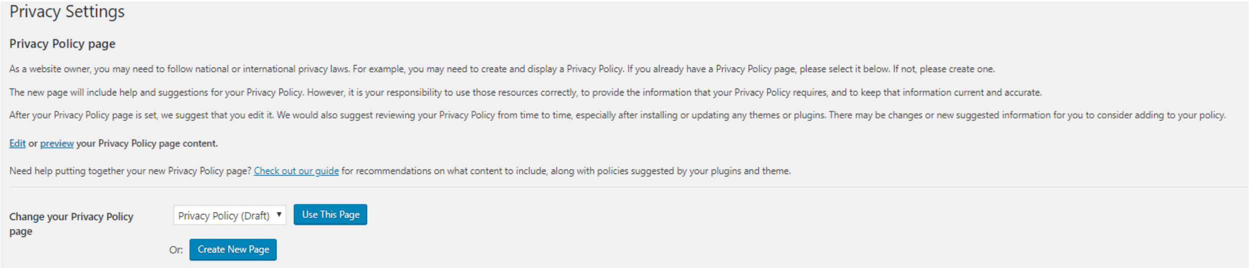
Available tags:

Optional

If you like, you may enter custom structures for your category and tag URLs here. For example, using `topics` as your category base would make your category links like `http://localhost/wp/topics/uncategorized/` . If you leave these blank the defaults will be used.

Category base	
Tag base	

Privacy Settings



Privacy Settings

Privacy Policy page

As a website owner, you may need to follow national or international privacy laws. For example, you may need to create and display a Privacy Policy. If you already have a Privacy Policy page, please select it below. If not, please create one.

The new page will include help and suggestions for your Privacy Policy. However, it is your responsibility to use those resources correctly, to provide the information that your Privacy Policy requires, and to keep that information current and accurate.

After your Privacy Policy page is set, we suggest that you edit it. We would also suggest reviewing your Privacy Policy from time to time, especially after installing or updating any themes or plugins. There may be changes or new suggested information for you to consider adding to your policy.

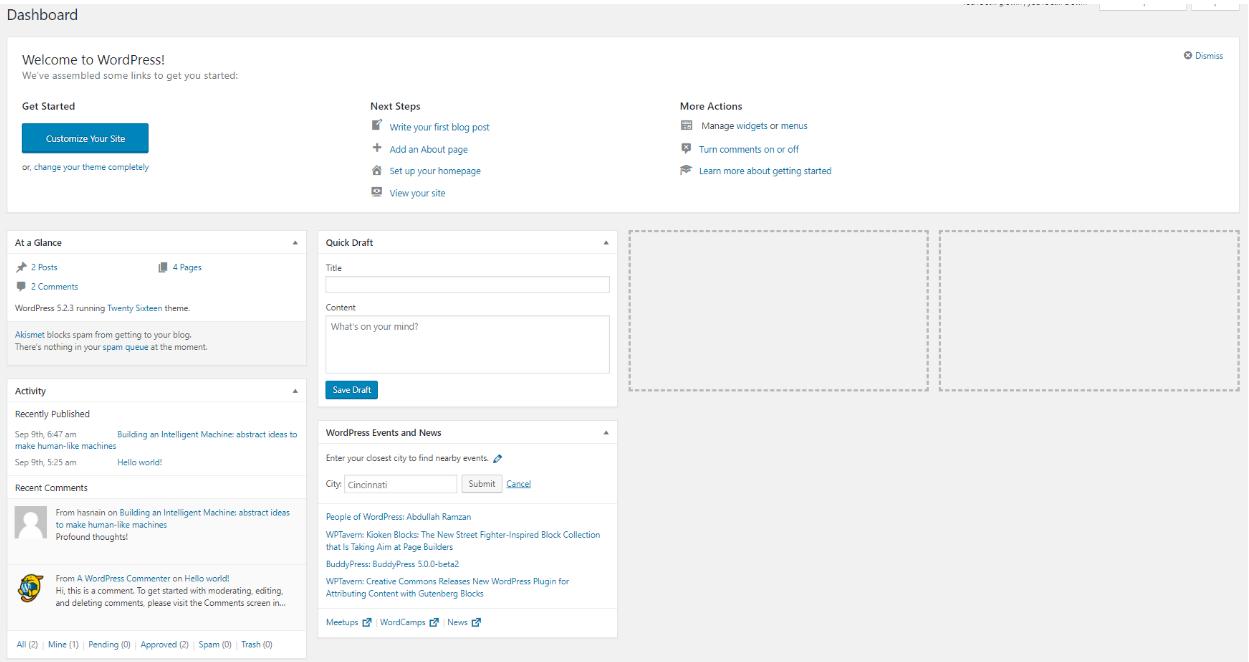
Edit or preview your Privacy Policy page content.

Need help putting together your new Privacy Policy page? Check out our guide for recommendations on what content to include, along with policies suggested by your plugins and theme.

Change your Privacy Policy page: Privacy Policy (Draft) ▾ | Use This Page

Or: Create New Page

2.2.15 Revisiting Dashboard



Dashboard

Welcome to WordPress!
We've assembled some links to get you started:

Get Started
Customize Your Site
or, change your theme completely

Next Steps
- Write your first blog post
- Add an About page
- Set up your homepage
- View your site

More Actions
- Manage widgets or menus
- Turn comments on or off
- Learn more about getting started

Dismiss

At a Glance
2 Posts | 4 Pages
2 Comments
WordPress 5.2.3 running Twenty Sixteen theme.
Akismet blocks spam from getting to your blog.
There's nothing in your spam queue at the moment.

Activity
Recently Published
Sep 9th, 6:47 am Building an Intelligent Machine: abstract ideas to make human-like machines
Sep 9th, 5:25 am Hello world!

Recent Comments
From hasnain on Building an Intelligent Machine: abstract ideas to make human-like machines
Profound thoughts!

From A WordPress Commenter on Hello world!
Hi, this is a comment. To get started with moderating, editing, and deleting comments, please visit the Comments screen in…

All (2) | Mine (1) | Pending (0) | Approved (2) | Spam (0) | Trash (0)

Quick Draft
Title:
Content: What's on your mind?
Save Draft

WordPress Events and News
Enter your closest city to find nearby events.
City: Cincinnati | Submit | Cancel

People of WordPress: Abdullah Ramzan
WPTavern: Kioken Blocks: The New Street Fighter-Inspired Block Collection that Is Taking Aim at Page Builders
BuddyPress: BuddyPress 5.0.0-beta2
WPTavern: Creative Commons Releases New WordPress Plugin for Attributing Content with Gutenberg Blocks

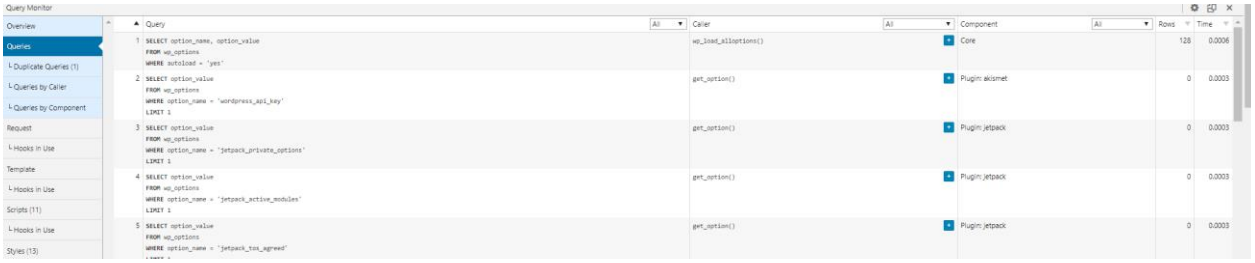
Meetups | WordCamps | News

3 Database Engineer’s Perspective: digging into Database and Relevant Code

3.1 Sharpening The Saw: configuring developer tools

3.1.1 Query Monitor

To look into the query, request, API and hook usage. It provides many other features to facilitate the debugging.



	Query	Caller	Component	Rows	Time

1	SELECT option_name, option_value
	FROM wp_options
	WHERE autoload = 'yes'
		wp_load_alloptions()	Core	128	0.0006

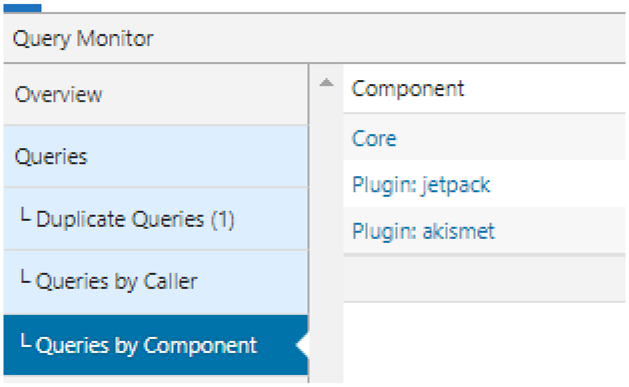
2	SELECT option_value
	FROM wp_options
	WHERE option_name = 'wordpress_api_key'
	LIMIT 1
		get_option()	Plugin: akismet	0	0.0003

3	SELECT option_value
	FROM wp_options
	WHERE option_name = 'jetpack_private_options'
	LIMIT 1
		get_option()	Plugin: jetpack	0	0.0003

4	SELECT option_value
	FROM wp_options
	WHERE option_name = 'jetpack_active_modules'
	LIMIT 1
		get_option()	Plugin: jetpack	0	0.0003

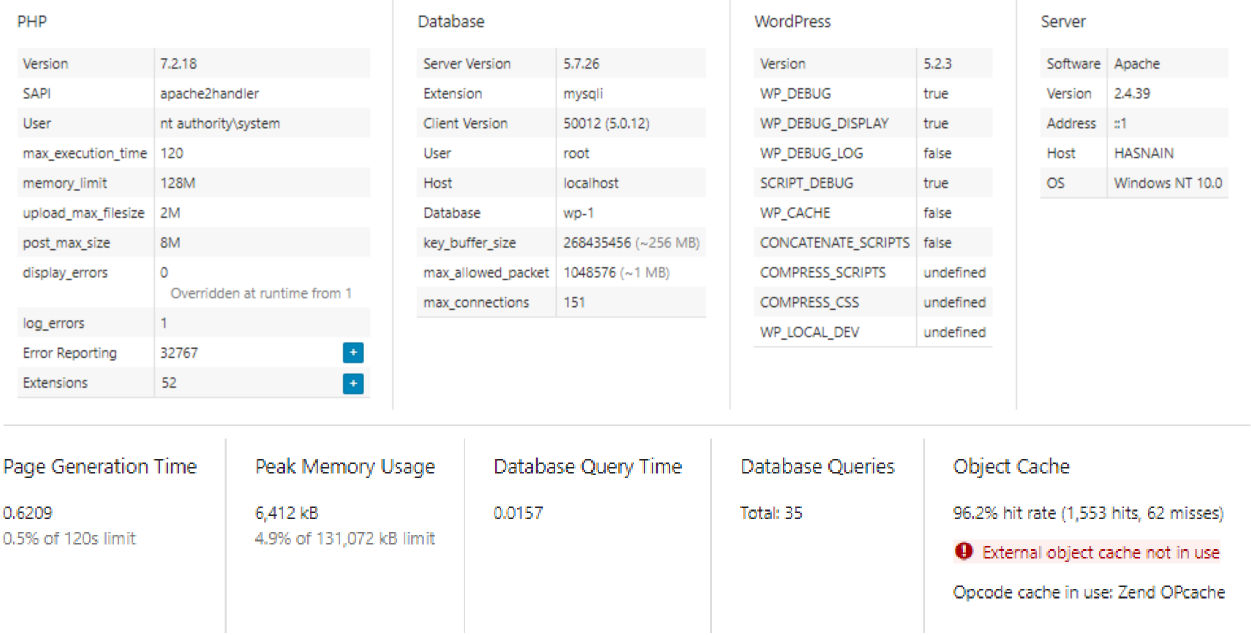
5	SELECT option_value
	FROM wp_options
	WHERE option_name = 'jetpack_tos_agreed'
		get_option()	Plugin: jetpack	0	0.0003

Queries executed on page



Component
Core
Plugin: jetpack
Plugin: akismet

Looking into categorized queries



PHP

Version	7.2.18
SAPI	apache2handler
User	nt authority\system
max_execution_time	120
memory_limit	128M
upload_max_filesize	2M
post_max_size	8M
display_errors	0 Overridden at runtime from 1
log_errors	1
Error Reporting	32767
Extensions	52

Database

Server Version	5.7.26
Extension	mysqli
Client Version	50012 (5.0.12)
User	root
Host	localhost
Database	wp-1
key_buffer_size	268435456 (~256 MB)
max_allowed_packet	1048576 (~1 MB)
max_connections	151

WordPress

Version	5.2.3
WP_DEBUG	true
WP_DEBUG_DISPLAY	true
WP_DEBUG_LOG	false
SCRIPT_DEBUG	true
WP_CACHE	false
CONCATENATE_SCRIPTS	false
COMPRESS_SCRIPTS	undefined
COMPRESS_CSS	undefined
WP_LOCAL_DEV	undefined

Server

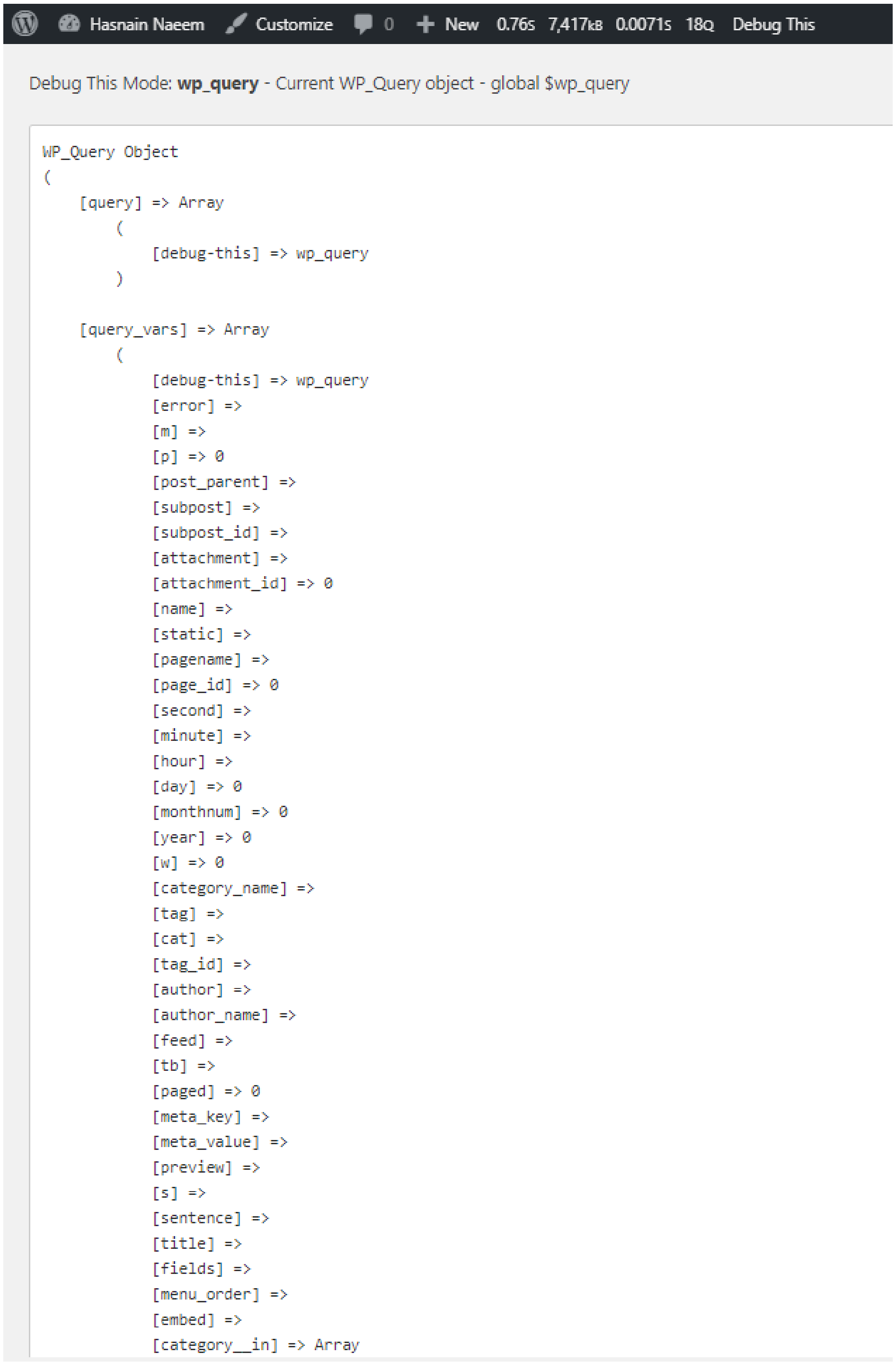
Software	Apache
Version	2.4.39
Address	::1
Host	HASNAIN
OS	Windows NT 10.0

Page Generation Time	Peak Memory Usage	Database Query Time	Database Queries	Object Cache
0.6209 0.5% of 120s limit	6,412 kB 4.9% of 131,072 kB limit	0.0157	Total: 35	96.2% hit rate (1,553 hits, 62 misses) External object cache not in use Opcode cache in use: Zend OPcache

Overview of details available for debugging

3.1.2 Debug This

This plugin offers a wide range of features for tracking features in WordPress. Shortcodes, PHP class/function usage, post types, media attachments, and many other things, can be tracked through this plugin.

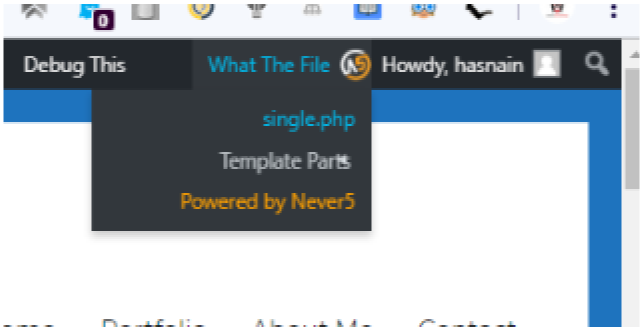


Debug This Mode: **wp_query** - Current WP_Query object - global $wp_query

```
WP_Query Object
(
    [query] => Array
        (
            [debug-this] => wp_query
        )

    [query_vars] => Array
        (
            [debug-this] => wp_query
            [error] =>
            [m] =>
            [p] => 0
            [post_parent] =>
            [subpost] =>
            [subpost_id] =>
            [attachment] =>
            [attachment_id] => 0
            [name] =>
            [static] =>
            [pagename] =>
            [page_id] => 0
            [second] =>
            [minute] =>
            [hour] =>
            [day] => 0
            [monthnum] => 0
            [year] => 0
            [w] => 0
            [category_name] =>
            [tag] =>
            [cat] =>
            [tag_id] =>
            [author] =>
            [author_name] =>
            [feed] =>
            [tb] =>
            [paged] => 0
            [meta_key] =>
            [meta_value] =>
            [preview] =>
            [s] =>
            [sentence] =>
            [title] =>
            [fields] =>
            [menu_order] =>
            [embed] =>
            [category__in] => Array
```

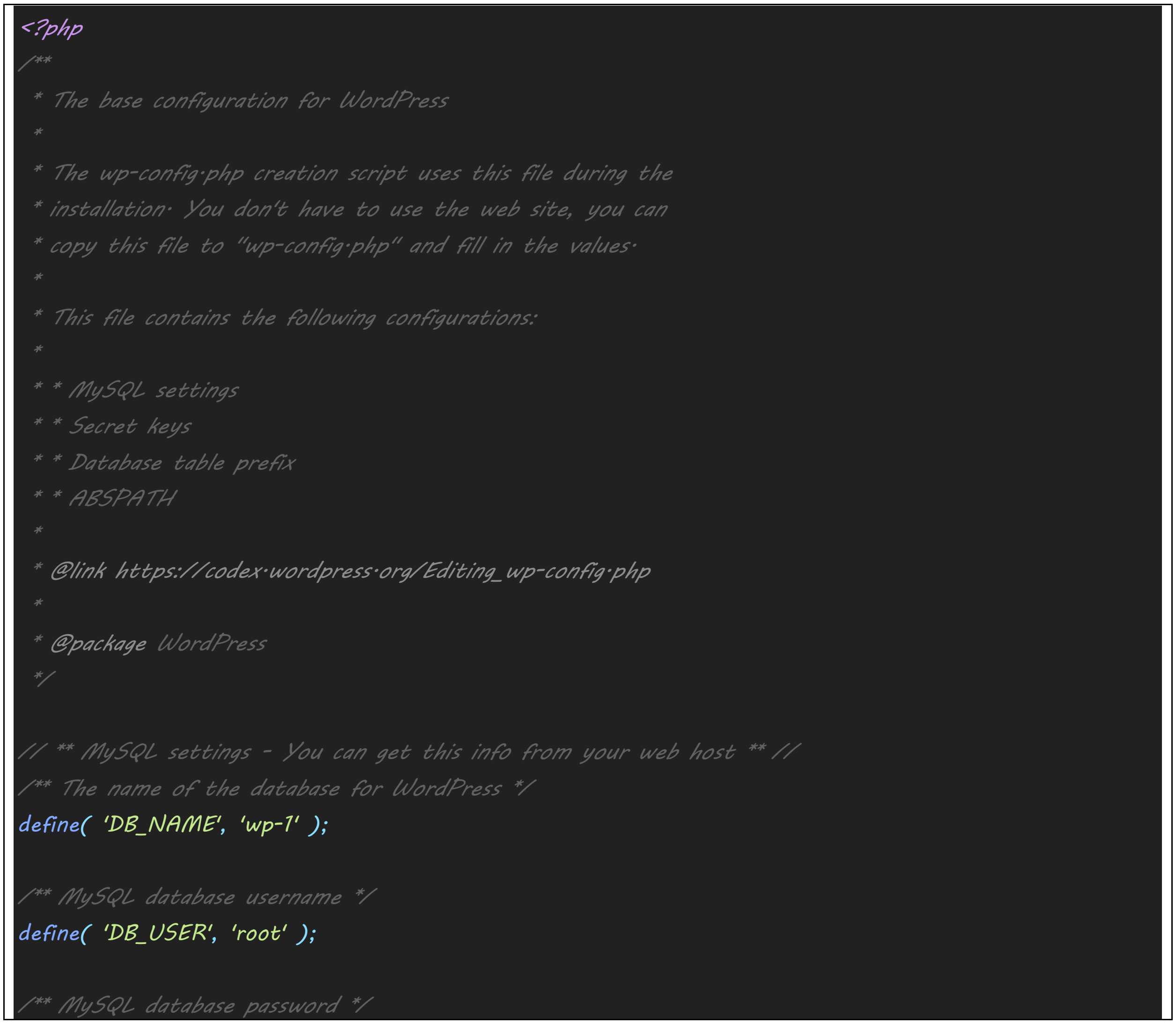
3.1.3 What the File

This plugin allows to quickly track the templates and parts of templates used in the current user request.

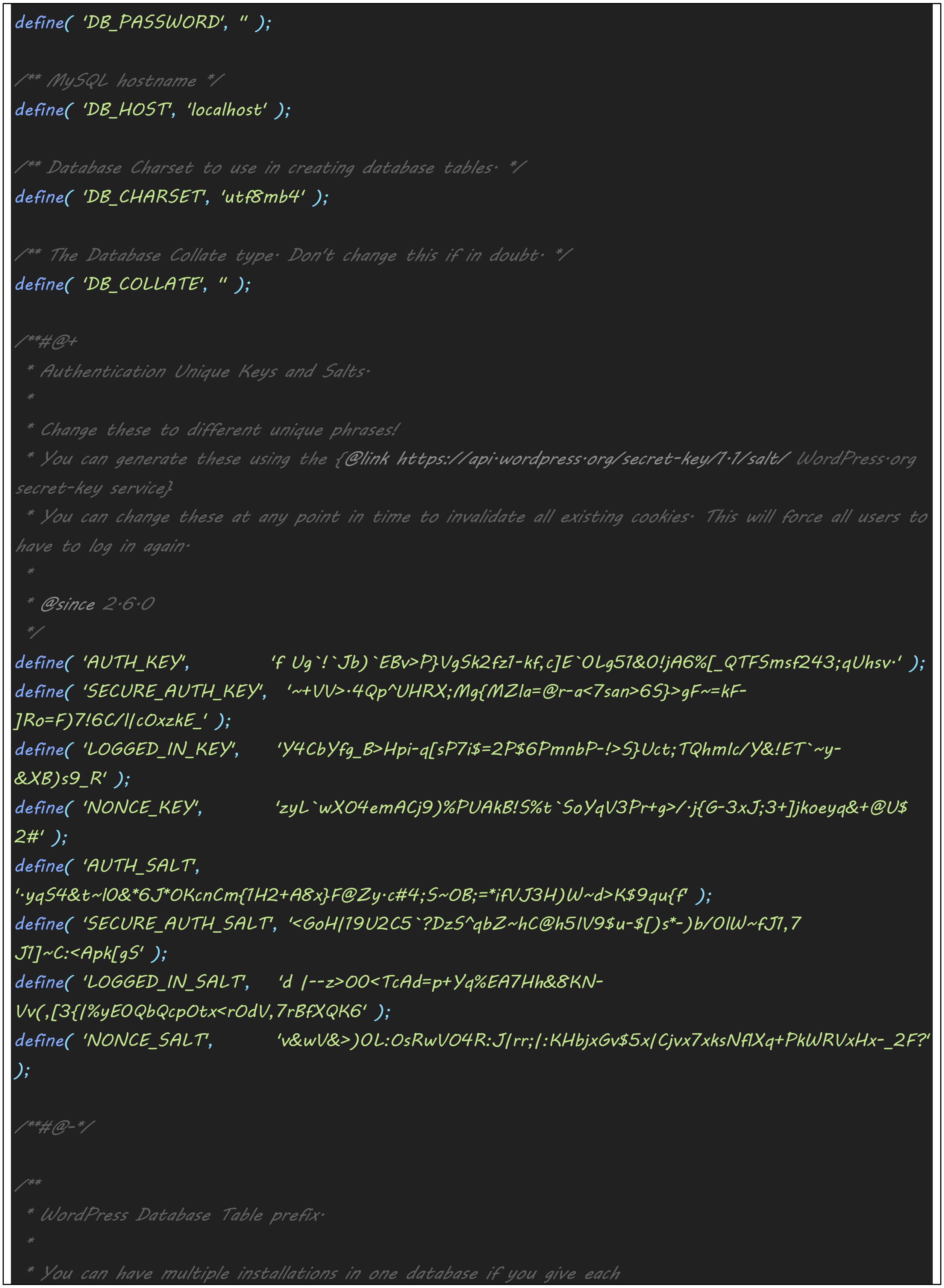


3.2 WORKING WITH CONFIGURATION FILE

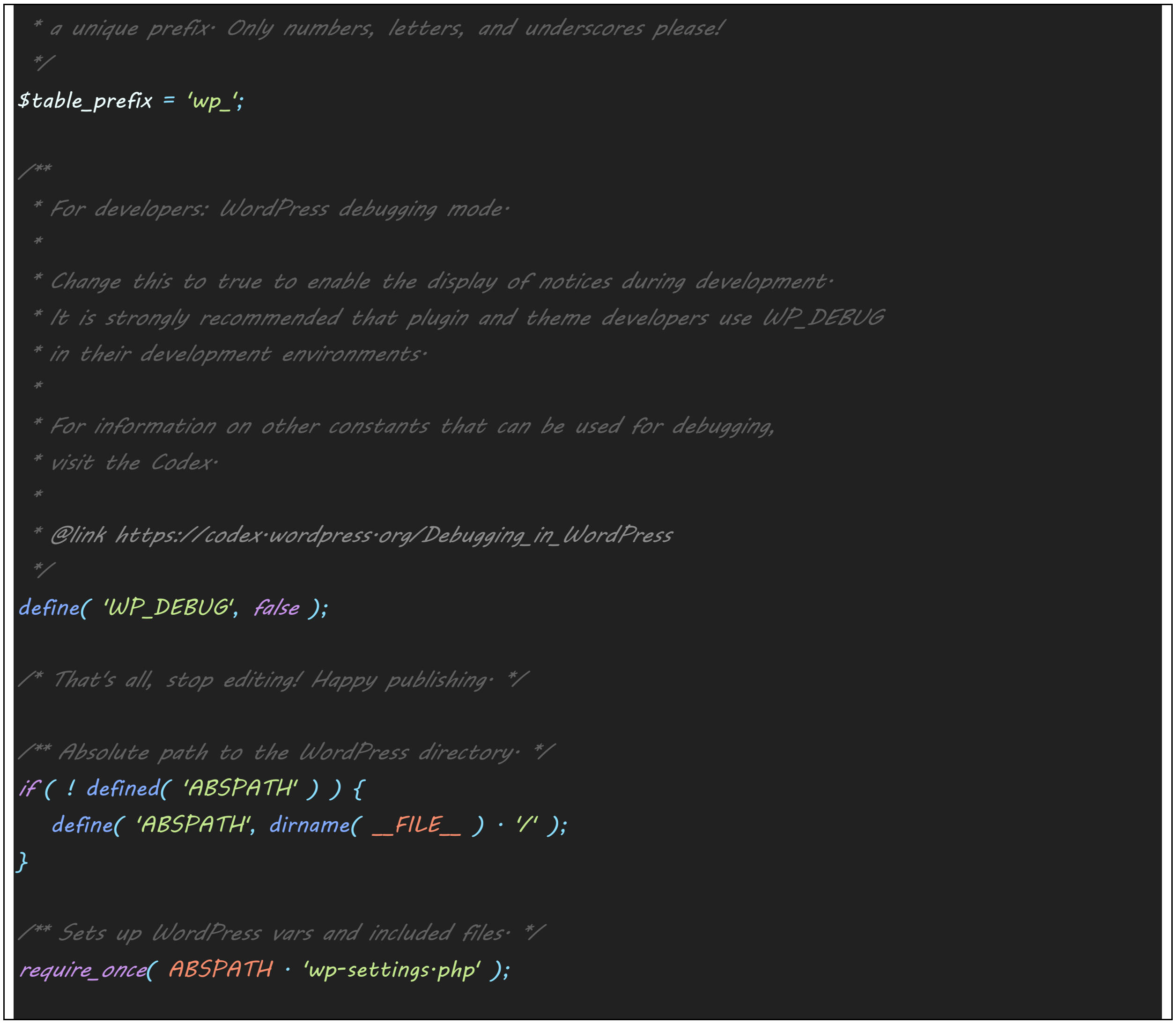
wp-config.php file contains the database details for wordpress. It can be modified to make other customizations in wordpress. Let's look at the file and customization examples.



```
<?php
/**
 * The base configuration for WordPress
 *
 * The wp-config.php creation script uses this file during the
 * installation. You don't have to use the web site, you can
 * copy this file to "wp-config.php" and fill in the values.
 *
 * This file contains the following configurations:
 *
 * * MySQL settings
 * * Secret keys
 * * Database table prefix
 * * ABSPATH
 *
 * @link https://codex.wordpress.org/Editing_wp-config.php
 *
 * @package WordPress
 */

// ** MySQL settings - You can get this info from your web host ** //
/** The name of the database for WordPress */
define( 'DB_NAME', 'wp-1' );

/** MySQL database username */
define( 'DB_USER', 'root' );

/** MySQL database password */
```



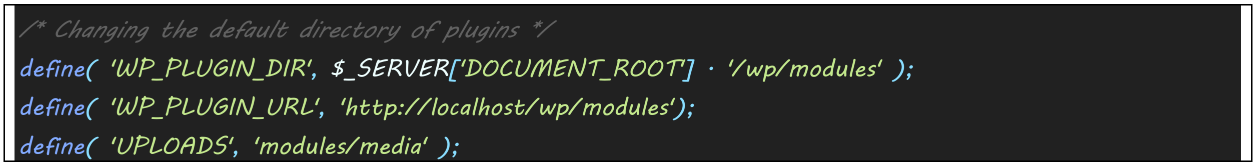
```
define( 'DB_PASSWORD', '' );

/** MySQL hostname */
define( 'DB_HOST', 'localhost' );

/** Database Charset to use in creating database tables. */
define( 'DB_CHARSET', 'utf8mb4' );

/** The Database Collate type. Don't change this if in doubt. */
define( 'DB_COLLATE', '' );

/**#@+
 * Authentication Unique Keys and Salts.
 *
 * Change these to different unique phrases!
 * You can generate these using the {@link https://api.wordpress.org/secret-key/1.1/salt/ WordPress.org
secret-key service}
 * You can change these at any point in time to invalidate all existing cookies. This will force all users to
have to log in again.
 *
 * @since 2.6.0
 */
define( 'AUTH_KEY',         'f Ug`!`Jb)`EBv>P}VgSk2fz1-kf,c]E`0Lg51&0!jA6%[_QTFSmsf243;qUhsv.' );
define( 'SECURE_AUTH_KEY',  '~+VV>.4Qp^UHRX;Mg{MZla=@r-a<7san>6S}>gF~=kF-
]Ro=F)7!6C/l|cOxzkE_' );
define( 'LOGGED_IN_KEY',    'Y4CbYfg_B>Hpi-q[sP7i$=2P$6PmnbP-!>S}Uct;TQhmlc/Y&!ET`~y-
&XB)s9_R' );
define( 'NONCE_KEY',        'zyL`wXO4emACj9)%PUAkB!S%t`SoYqV3Pr+g>/.j{G-3xJ;3+]jkoeyq&+@U$
2#' );
define( 'AUTH_SALT',
'.yqS4&t~l0&*6J*OKcnCm{1H2+A8x}F@Zy.c#4;S~0B;=*ifVJ3H)W~d>K$9qu{f' );
define( 'SECURE_AUTH_SALT', '<GoH|19U2C5`?DzS^qbZ~hC@h5IV9$u-$[)s*-)b/0lW~fJ1,7
J1]~C:<Apk[gS' );
define( 'LOGGED_IN_SALT',   'd |--z>00<TcAd=p+Yq%EA7Hh&8KN-
Vv(,[3{|%yE0QbQcpOtx<rOdV,7rBfXQK6' );
define( 'NONCE_SALT',       'v&wV&>)0L:OsRwVO4R:J|rr;|:KHbjxGv$5x|Cjvx7xksNflXq+PkWRVxHx-_2F?'
);

/**#@-*/

/**
 * WordPress Database Table prefix.
 *
 * You can have multiple installations in one database if you give each
```



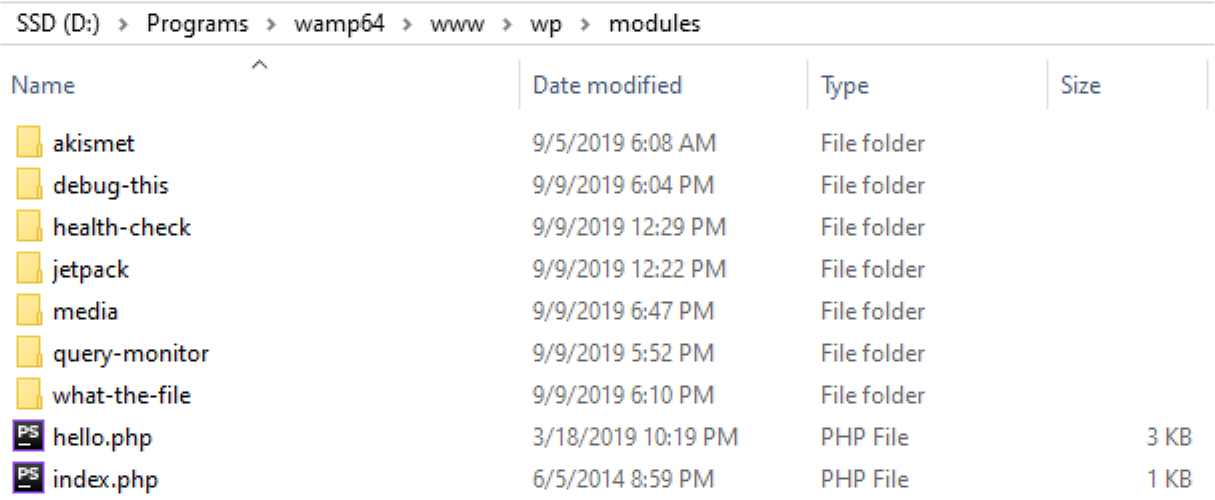
```
 * a unique prefix. Only numbers, letters, and underscores please!
 */
$table_prefix = 'wp_';

/**
 * For developers: WordPress debugging mode.
 *
 * Change this to true to enable the display of notices during development.
 * It is strongly recommended that plugin and theme developers use WP_DEBUG
 * in their development environments.
 *
 * For information on other constants that can be used for debugging,
 * visit the Codex.
 *
 * @link https://codex.wordpress.org/Debugging_in_WordPress
 */
define( 'WP_DEBUG', false );

/* That's all, stop editing! Happy publishing. */

/** Absolute path to the WordPress directory. */
if ( ! defined( 'ABSPATH' ) ) {
   define( 'ABSPATH', dirname( __FILE__ ) . '/' );
}

/** Sets up WordPress vars and included files. */
require_once( ABSPATH . 'wp-settings.php' );
```

Due to open-source nature, everyone knows about the directory structure of Wordpress. To make it difficult for hackers to attack it, we can move the plugins in another directory by changing the wp-config.php file.

Let's add configurations to change the default location of these directories:



```
/* Changing the default directory of plugins */
define( 'WP_PLUGIN_DIR', $_SERVER['DOCUMENT_ROOT'] . '/wp/modules' );
define( 'WP_PLUGIN_URL', 'http://localhost/wp/modules');
define( 'UPLOADS', 'modules/media' );
```

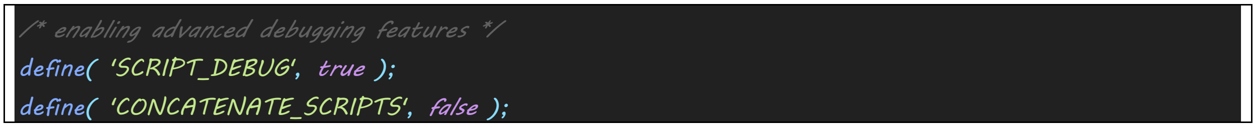

SSD (D:) › Programs › wamp64 › www › wp › modules

Name	Date modified	Type	Size
akismet	9/5/2019 6:08 AM	File folder	
debug-this	9/9/2019 6:04 PM	File folder	
health-check	9/9/2019 12:29 PM	File folder	
jetpack	9/9/2019 12:22 PM	File folder	
media	9/9/2019 6:47 PM	File folder	
query-monitor	9/9/2019 5:52 PM	File folder	
what-the-file	9/9/2019 6:10 PM	File folder	
hello.php	3/18/2019 10:19 PM	PHP File	3 KB
index.php	6/5/2014 8:59 PM	PHP File	1 KB

Advanced debugging mode

Script debugging

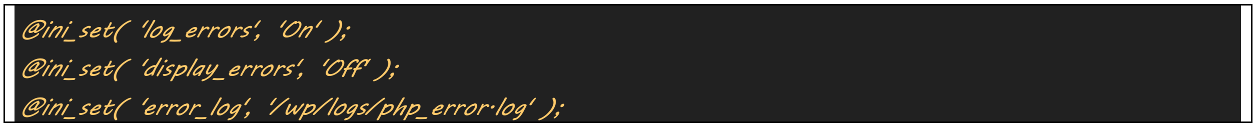
In general, conflicts in JavaScript files are a common problem due to the use of different script versions in different plugins and themes. Identifying these errors is a cumbersome process when using minified versions and concatenated script files. Let's take a look at some of the rules used for resolving these issues:



```
/* enabling advanced debugging features */
define( 'SCRIPT_DEBUG', true );
define( 'CONCATENATE_SCRIPTS', false );
```

The first line enables script debugging by loading the uncompressed file instead of the minified version. The second line prevents concatenation of multiple scripts, allowing you to track the line of the error. You should use these configuration rules when you are experiencing script issues in WordPress core files.

php.ini



```
@ini_set( 'log_errors', 'On' );
@ini_set( 'display_errors', 'Off' );
@ini_set( 'error_log', '/wp/logs/php_error.log' );
```

First, we enable error logging in PHP and disable displaying errors in the browser by using the display_errors setting. Then, we define the path of the file where errors will be logged. You need to create this directory first and provide the necessary write permissions before this rule takes effect.

3.3 Directories and File Structure

Let's look at some of the most important files and directories inside WordPress:

wp-admin: Files related to admin-side functionality are stored in this directory. Main file of this directory is admin.php. Contents of this directory are replaced whenever the Wordpress is updated.

wp-content: This is where the content uploaded by user is stored such as plugins, themes and media files. This directory can be used for custom content storage because it is not replaced/deleted during the Wordpress Update.

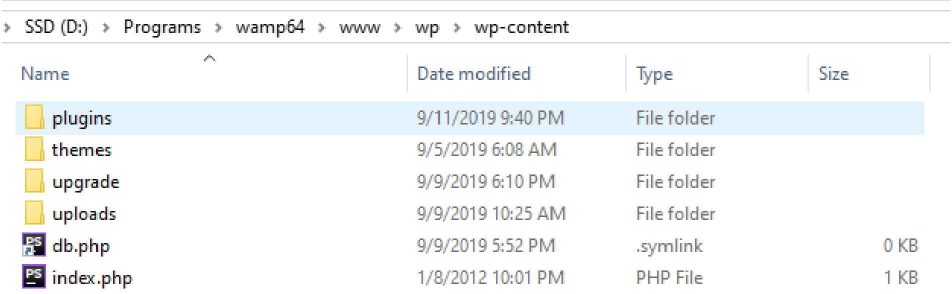
wp-includes: This directory powers whole Wordpress infrastructure including front-end and back-end. It includes main Wordpress API file: functions.php. This directory is impacted during Wordpress Update.

.htaccess: All the configuration rules for apache server are saved in this file.

index.php: This file initializes the WordPress and acts as a root file.

wp-config.php: This file is to add & modify configurations for Wordpress site including media, plugins, databases, themes and secret keys. It is not replaced during update hence configurations remain unchanged during update.

Files and Directories used for Development



› SSD (D:) › Programs › wamp64 › www › wp › wp-content

Name	Date modified	Type	Size
plugins	9/11/2019 9:40 PM	File folder	
themes	9/5/2019 6:08 AM	File folder	
upgrade	9/9/2019 6:10 PM	File folder	
uploads	9/9/2019 10:25 AM	File folder	
db.php	9/9/2019 5:52 PM	.symlink	0 KB
index.php	1/8/2012 10:01 PM	PHP File	1 KB

plugins: All the plugins are stored in their directories inside this directory. User can add plugins to this directory through file manager, FTP server or through admin panel.

themes: This directory stores all the theme files. Like plugins, new themes can be added to this folder manually or through admin panel. Unlike plugins, only one theme is active at a time (assuming wordpress installation is not multi-site.

uploads: This directory is used to store files for plugins, posts and pages. Sub-directories can be made in it and used for custom file storage.

3.4 Coding Practices: Understanding and Extending Code Elegantly

Single quotes and double quotes: PHP evaluates string with double quotes. That’s why use of single quotes on pure strings is recommended to increase the speed.

Indentation: Tabs should be used instead of spaces.

Opening and closing brackets: Opening and closing brackets should always be used.

Naming conventions: Lowercase letters and underscores should be used for naming variables, functions, filters, actions. The camelCase naming convention is not used in Wordpress.

Dynamic hooks: Use of interpolation by wrapping the variable in curly brackets is recommended instead of using concatenation.

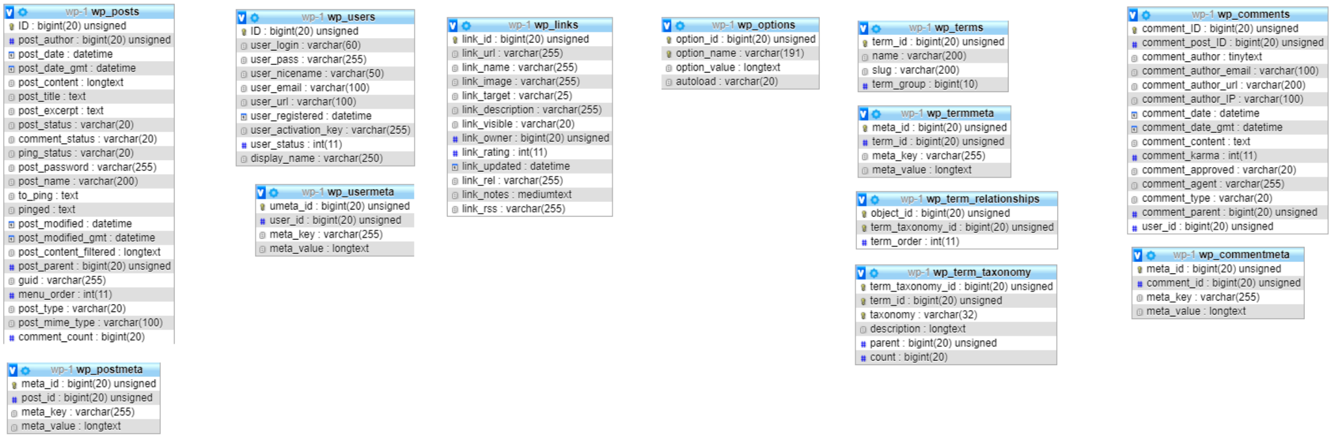
Scripts and styles: wp_enqueue_scripts action should be used to load stylesheets and other scripts for security purposes and to prevent conflicts with other wordpress code.

Third-party libraries: Library shipped with the Wordpress should be used, instead of using different versions of same libraries to prevent conflicts between code of different themes, plugins and core files.

Using appropriate events for execution: Hooks are used in WordPress for event-driven architecture. Hence, the code is executed in a predefined manner through events. Developer must consider default and custom events to prevent conflicts. For example, $_POST variables should be accessed within or after an init hook. Trying to access the data before or after a specific event can lead to errors.

3.5 Looking into the Database

There are 12 tables within database.



```
wp-1 wp_posts
ID : bigint(20) unsigned
post_author : bigint(20) unsigned
post_date : datetime
post_date_gmt : datetime
post_content : longtext
post_title : text
post_excerpt : text
post_status : varchar(20)
comment_status : varchar(20)
ping_status : varchar(20)
post_password : varchar(255)
post_name : varchar(200)
to_ping : text
pinged : text
post_modified : datetime
post_modified_gmt : datetime
post_content_filtered : longtext
post_parent : bigint(20) unsigned
guid : varchar(255)
menu_order : int(11)
post_type : varchar(20)
post_mime_type : varchar(100)
comment_count : bigint(20)

wp-1 wp_postmeta
meta_id : bigint(20) unsigned
post_id : bigint(20) unsigned
meta_key : varchar(255)
meta_value : longtext

wp-1 wp_users
ID : bigint(20) unsigned
user_login : varchar(60)
user_pass : varchar(255)
user_nicename : varchar(50)
user_email : varchar(100)
user_url : varchar(100)
user_registered : datetime
user_activation_key : varchar(255)
user_status : int(11)
display_name : varchar(250)

wp-1 wp_usermeta
umeta_id : bigint(20) unsigned
user_id : bigint(20) unsigned
meta_key : varchar(255)
meta_value : longtext

wp-1 wp_links
link_id : bigint(20) unsigned
link_url : varchar(255)
link_name : varchar(255)
link_image : varchar(255)
link_target : varchar(25)
link_description : varchar(255)
link_visible : varchar(20)
link_owner : bigint(20) unsigned
link_rating : int(11)
link_updated : datetime
link_rel : varchar(255)
link_notes : mediumtext
link_rss : varchar(255)

wp-1 wp_options
option_id : bigint(20) unsigned
option_name : varchar(191)
option_value : longtext
autoload : varchar(20)

wp-1 wp_terms
term_id : bigint(20) unsigned
name : varchar(200)
slug : varchar(200)
term_group : bigint(10)

wp-1 wp_termmeta
meta_id : bigint(20) unsigned
term_id : bigint(20) unsigned
meta_key : varchar(255)
meta_value : longtext

wp-1 wp_term_relationships
object_id : bigint(20) unsigned
term_taxonomy_id : bigint(20) unsigned
term_order : int(11)

wp-1 wp_term_taxonomy
term_taxonomy_id : bigint(20) unsigned
term_id : bigint(20) unsigned
taxonomy : varchar(32)
description : longtext
parent : bigint(20) unsigned
count : bigint(20)

wp-1 wp_comments
comment_ID : bigint(20) unsigned
comment_post_ID : bigint(20) unsigned
comment_author : tinytext
comment_author_email : varchar(100)
comment_author_url : varchar(200)
comment_author_IP : varchar(100)
comment_date : datetime
comment_date_gmt : datetime
comment_content : text
comment_karma : int(11)
comment_approved : varchar(20)
comment_agent : varchar(255)
comment_type : varchar(20)
comment_parent : bigint(20) unsigned
user_id : bigint(20) unsigned

wp-1 wp_commentmeta
meta_id : bigint(20) unsigned
comment_id : bigint(20) unsigned
meta_key : varchar(255)
meta_value : longtext
```

Namely,

- wp_posts
- wp_postmeta
- wp_users
- wp_usermeta
- wp_links
- wp_options
- wp_terms
- wp_termmeta
- wp_term_relationships
- wp_term_taxonomy
- wp_comments
- wp_commentmeta

Let us look at the tables one by one.

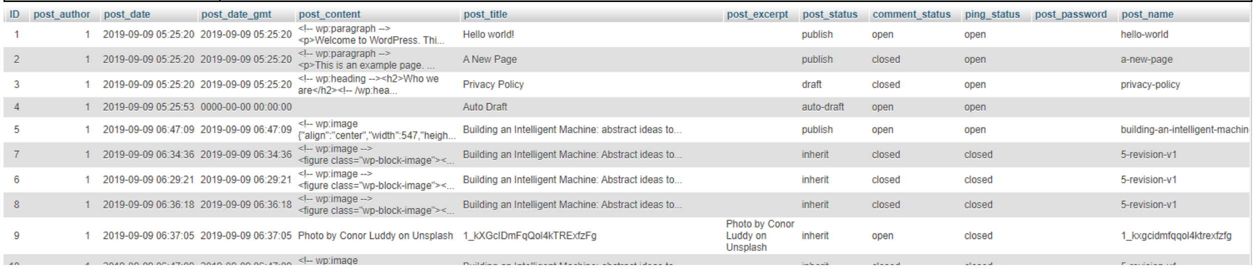
3.5.1 Posts

wp_posts:

Contains content of default and custom posts. Also, content of pages is stored in this table.

post_author	Contains the ID of user who created the post or page. This variable is used to form the relationship with wp_users table.
post_content	Stores the content of post or page.
post_title	Stores the title of post or page.
post_excerpt	Contains the summary of post or page.
post_status	A string indicating the type of post or page is stored in this column. Its values can be: publish, pending, private, future, inherit, trash, draft, and auto-draft. Whenever a post is modified, previous copy is stored within database with post_status

	‘inherit’. ‘auto-draft’ is used as post_status when wordpress automatically stores the copy of post being drafted.
post_password	Contains the password for protected posts or pages.
post_parent	Contains the ID of parent post or page.
guid	Contains the URL of post or page.
post_type	Stores the string representing the type of post. It can be post, page, revision, attachment, and nav_menu_item or custom post type.

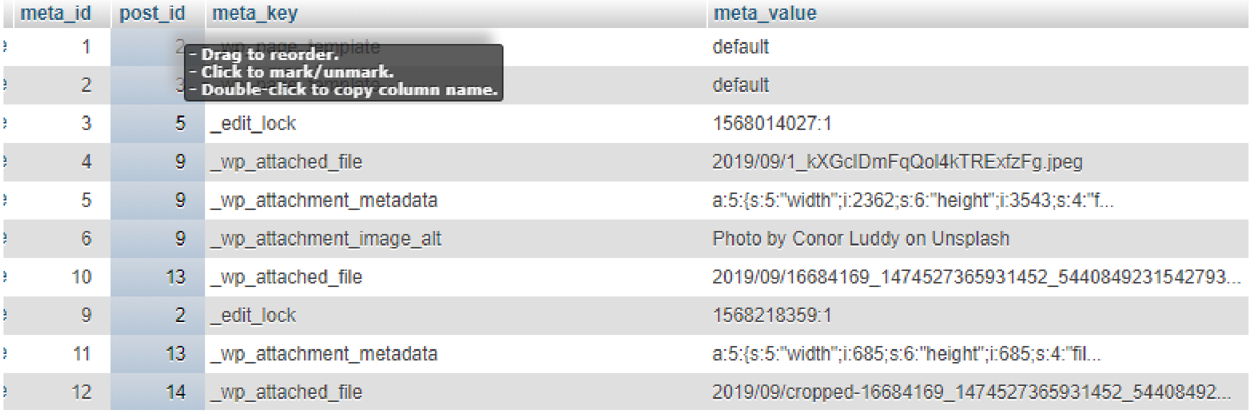


ID	post_author	post_date	post_date_gmt	post_content	post_title	post_excerpt	post_status	comment_status	ping_status	post_password	post_name
1	1	2019-09-09 05:25:20	2019-09-09 05:25:20	<!-- wp:paragraph --> <p>Welcome to WordPress. Thi...	Hello world!		publish	open	open		hello-world
2	1	2019-09-09 05:25:20	2019-09-09 05:25:20	<!-- wp:paragraph --> <p>This is an example page. ...	A New Page		publish	closed	open		a-new-page
3	1	2019-09-09 05:25:20	2019-09-09 05:25:20	<!-- wp:heading --><h2>Who we are</h2><!-- /wp:hea...	Privacy Policy		draft	closed	open		privacy-policy
4	1	2019-09-09 05:25:53	0000-00-00 00:00:00		Auto Draft		auto-draft	open	open		
5	1	2019-09-09 06:47:09	2019-09-09 06:47:09	<!-- wp:image {"align":"center","width":547,"heigh...	Building an Intelligent Machine: abstract ideas to...		publish	open	open		building-an-intelligent-machin
7	1	2019-09-09 06:34:36	2019-09-09 06:34:36	<!-- wp:image --> <figure class="wp-block-image"><...	Building an Intelligent Machine: Abstract ideas to...		inherit	closed	closed		5-revision-v1
6	1	2019-09-09 06:29:21	2019-09-09 06:29:21	<!-- wp:image --> <figure class="wp-block-image"><...	Building an Intelligent Machine: Abstract ideas to...		inherit	closed	closed		5-revision-v1
8	1	2019-09-09 06:36:18	2019-09-09 06:36:18	<!-- wp:image --> <figure class="wp-block-image"><...	Building an Intelligent Machine: Abstract ideas to...		inherit	closed	closed		5-revision-v1
9	1	2019-09-09 06:37:05	2019-09-09 06:37:05	Photo by Conor Luddy on Unsplash	1_kXGcIDmFqQol4kTRExfzFg	Photo by Conor Luddy on Unsplash	inherit	open	closed		1_kxgcidmfqqol4ktrexfzfg
				<!-- wp:image							

wp_postmeta

Used to store the custom data for posts in the form of key-value pairs.

post_id	post_id from wp_posts table as foreign key
meta_id	Contains primary key for the table
meta_key	Key of additional information for post.
meta_value	Value of additional information for post.



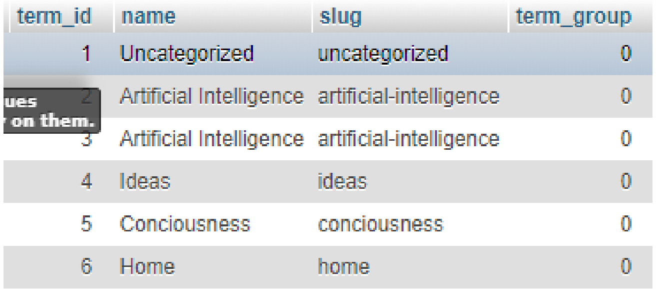
meta_id	post_id	meta_key	meta_value
1	2	_wp_page_template	default
2	3	[illegible]	default
3	5	_edit_lock	1568014027:1
4	9	_wp_attached_file	2019/09/1_kXGcIDmFqQol4kTRExfzFg.jpeg
5	9	_wp_attachment_metadata	a:5:{s:5:"width";i:2362;s:6:"height";i:3543;s:4:"f...
6	9	_wp_attachment_image_alt	Photo by Conor Luddy on Unsplash
10	13	_wp_attached_file	2019/09/16684169_1474527365931452_5440849231542793...
9	2	_edit_lock	1568218359:1
11	13	_wp_attachment_metadata	a:5:{s:5:"width";i:685;s:6:"height";i:685;s:4:"fil...
12	14	_wp_attached_file	2019/09/cropped-16684169_1474527365931452_54408492...

3.5.2 Term & Taxonomy Tables

wp_terms

Stores the terms belonging to different taxonomies.

term_id	Stores an integer ID for current term
name	Name of category/tag or a custom taxonomy
slug	Unique identifier for the tag/category or custom taxonomy

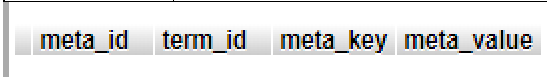


term_id	name	slug	term_group
1	Uncategorized	uncategorized	0
2	Artificial Intelligence	artificial-intelligence	0
3	Artificial Intelligence	artificial-intelligence	0
4	Ideas	ideas	0
5	Conciousness	conciousness	0
6	Home	home	0

wp_termmeta

Used to store the custom information for terms. It is not used by default.

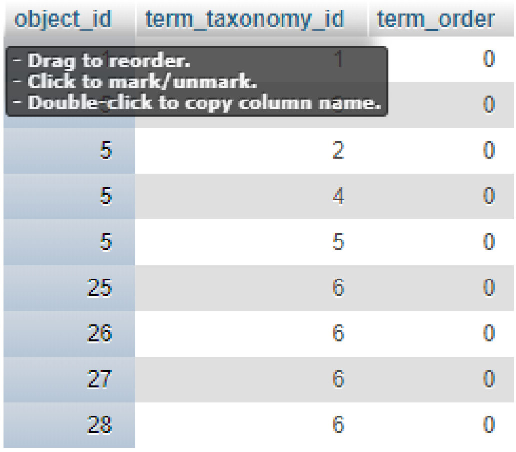
meta_id	Primary key for the table
term_id	Contains the ID of term whose data is stored.
meta_key	Key of custom data to be stored
meta_value	Value of custom data to be stored



meta_id	term_id	meta_key	meta_value

wp_term_relationships

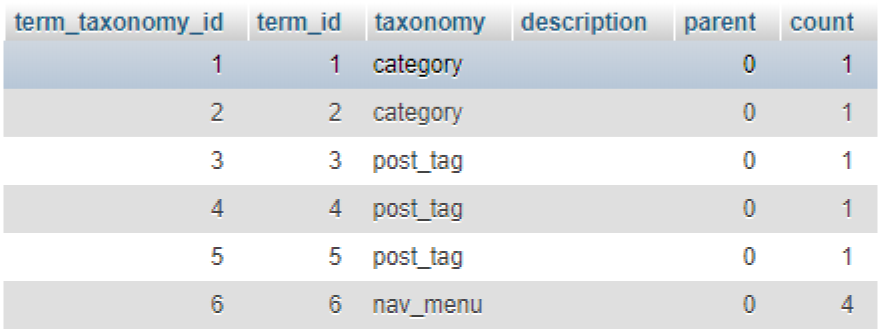
object_id	ID of post/page
term_taxonomy_id	ID of taxonomy



object_id	term_taxonomy_id	term_order
1	1	0
5	3	0
5	2	0
5	4	0
5	5	0
25	6	0
26	6	0
27	6	0
28	6	0

wp_term_taxonomy

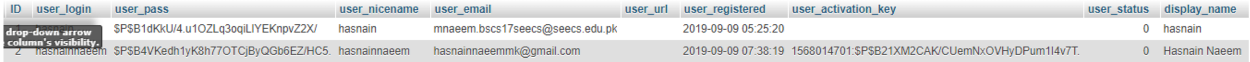
term_id	ID of term
taxonomy	String representing the taxonomy. Default taxonomies are post_tag and category.
parent	String representing the parent term when current term is sub-term.
count	Stores the number of posts and pages belonging to the current term



term_taxonomy_id	term_id	taxonomy	description	parent	count
1	1	category		0	1
2	2	category		0	1
3	3	post_tag		0	1
4	4	post_tag		0	1
5	5	post_tag		0	1
6	6	nav_menu		0	4

wp_users

user_login	Contains the unique usernames of users
user_pass	Contains the encrypted passwords
user_email	Stores unique emails of users
user_registered	Stores date of registration of user
user_activation_key	Stores string used in during Hashing of password

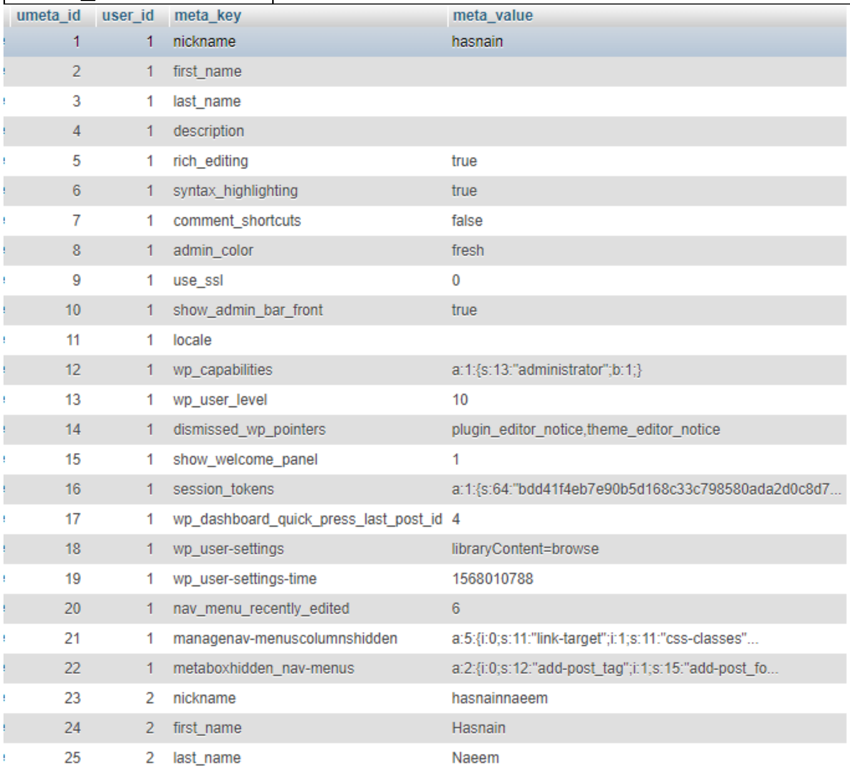


ID	user_login	user_pass	user_nicename	user_email	user_url	user_registered	user_activation_key	user_status	display_name
1	hasnain	PB1dKkU/4.u1OZLq3oqiLIYEKnpvZ2X/	hasnain	mnaeem.bscs17seecs@seecs.edu.pk		2019-09-09 05:25:20		0	hasnain
2	hasnainnaeem	PB4VKedh1yK8h77OTCjByQGb6EZ/HC5.	hasnainnaeem	hasnainnaeemmk@gmail.com		2019-09-09 07:38:19	1568014701:PB21XM2CAK/CUemNxOVHyDPum1I4v7T.	0	Hasnain Naeem

wp_usermeta

Used to store more details about the user such as birthday, profile picture(s) and introduction.

umeta_id	Primary key of table
user_id	Foreign key of wp_users table
meta_key	Key of custom data to be stored
meta_value	Value of custom data to be stored



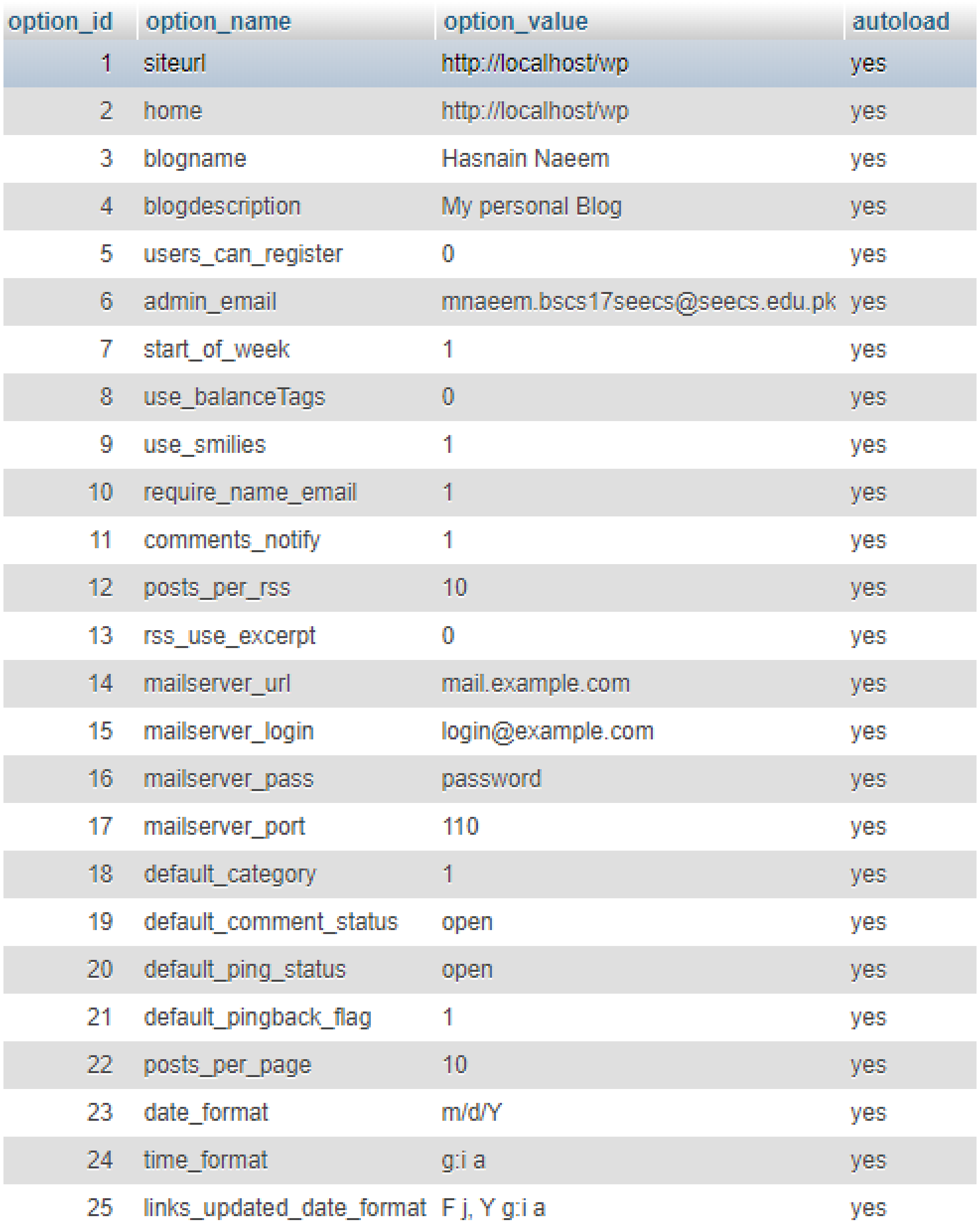
umeta_id	user_id	meta_key	meta_value
1	1	nickname	hasnain
2	1	first_name	
3	1	last_name	
4	1	description	
5	1	rich_editing	true
6	1	syntax_highlighting	true
7	1	comment_shortcuts	false
8	1	admin_color	fresh
9	1	use_ssl	0
10	1	show_admin_bar_front	true
11	1	locale	
12	1	wp_capabilities	a:1:{s:13:"administrator";b:1;}
13	1	wp_user_level	10
14	1	dismissed_wp_pointers	plugin_editor_notice,theme_editor_notice
15	1	show_welcome_panel	1
16	1	session_tokens	a:1:{s:64:"bdd41f4eb7e90b5d168c33c798580ada2d0c8d7...
17	1	wp_dashboard_quick_press_last_post_id	4
18	1	wp_user-settings	libraryContent=browse
19	1	wp_user-settings-time	1568010788
20	1	nav_menu_recently_edited	6
21	1	managenav-menuscolumnshidden	a:5:{i:0;s:11:"link-target";i:1;s:11:"css-classes"...
22	1	metaboxhidden_nav-menus	a:2:{i:0;s:12:"add-post_tag";i:1;s:15:"add-post_fo...
23	2	nickname	hasnainnaeem
24	2	first_name	Hasnain
25	2	last_name	Naeem

3.5.3 Configurations and Comments Tables

wp_options

Used to store the information of different options as key-value pairs. For example, sire url, blog name, blog description, date format and so on. This table can also be used to store the custom information regarding options of themes and plugins of wordpress.

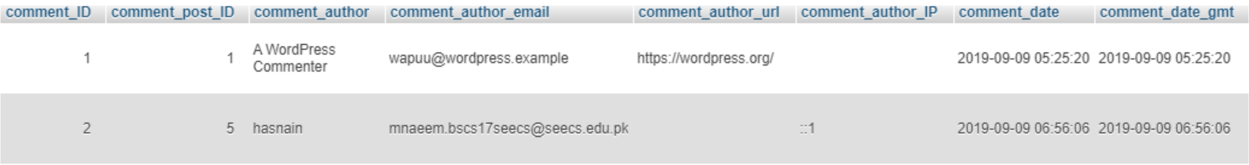
option_id	Primary key of table
option_name	Key of custom option information
option_value	Value of custom option key-value pair information
autoload	Boolean value determines whether the option details should be automatically loaded or not.



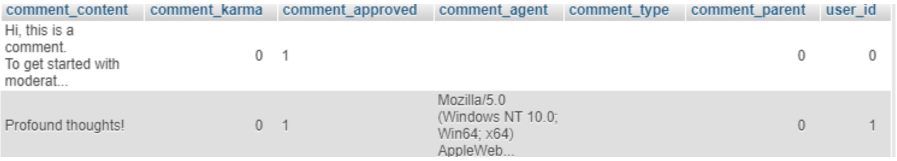
option_id	option_name	option_value	autoload
1	siteurl	http://localhost/wp	yes
2	home	http://localhost/wp	yes
3	blogname	Hasnain Naeem	yes
4	blogdescription	My personal Blog	yes
5	users_can_register	0	yes
6	admin_email	mnaeem.bscs17seecs@seecs.edu.pk	yes
7	start_of_week	1	yes
8	use_balanceTags	0	yes
9	use_smilies	1	yes
10	require_name_email	1	yes
11	comments_notify	1	yes
12	posts_per_rss	10	yes
13	rss_use_excerpt	0	yes
14	mailserver_url	mail.example.com	yes
15	mailserver_login	login@example.com	yes
16	mailserver_pass	password	yes
17	mailserver_port	110	yes
18	default_category	1	yes
19	default_comment_status	open	yes
20	default_ping_status	open	yes
21	default_pingback_flag	1	yes
22	posts_per_page	10	yes
23	date_format	m/d/Y	yes
24	time_format	g:i a	yes
25	links_updated_date_format	F j, Y g:i a	yes

wp_comments

Contains the details of all comments on the blog such as comment author, comment author url, IP of commentor, date of comment, content of comment and details about the computer from which comment was made.



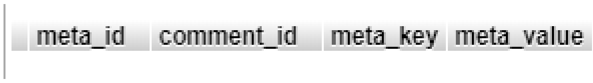
comment_ID	comment_post_ID	comment_author	comment_author_email	comment_author_url	comment_author_IP	comment_date	comment_date_gmt
1	1	A WordPress Commenter	wapuu@wordpress.example	https://wordpress.org/		2019-09-09 05:25:20	2019-09-09 05:25:20
2	5	hasnain	mnaeem.bscs17seecs@seecs.edu.pk		::1	2019-09-09 06:56:06	2019-09-09 06:56:06



comment_content	comment_karma	comment_approved	comment_agent	comment_type	comment_parent	user_id
Hi, this is a comment. To get started with moderat...	0	1			0	0
Profound thoughts!	0	1	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWeb...		0	1

wp_commentmeta

This table is used to store the secondary information of comment data. This is similar to wp_postmeta and wp_usermeta.



meta_id	comment_id	meta_key	meta_value

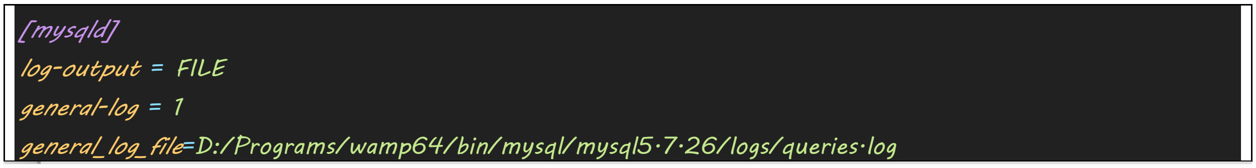
3.5.4 Media

Wordpress uses wp_posts and wp_postmeta tables to store the information relevent to media files. It treats media as a post and stores additional details like captions, height, and width in wp_postmeta table. It is not a good approach, because whilst searching for an actual post we must iterate through (sometimes a very large number of) media files.

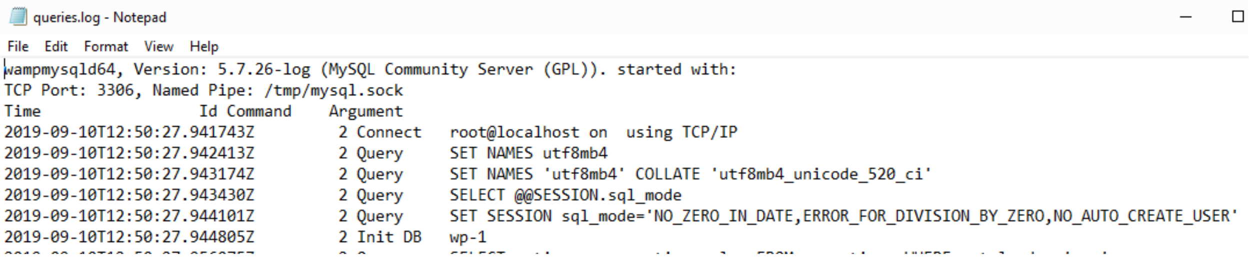
3.6 TRACKING THE DATABASE USAGE IN WORDPRESS

3.6.1 Using my.ini File of Database

Pasting the following code in my.ini file (located in ...\wamp64\bin\mysql\mysql5.7.26 or …\wamp64\bin\mariadb\mariadb10.3.14) will store all the (MYSQL or MariaDB) database queries into a log file located at the specified path.



```
[mysqld]
log-output = FILE
general-log = 1
general_log_file=D:/Programs/wamp64/bin/mysql/mysql5.7.26/logs/queries.log
```

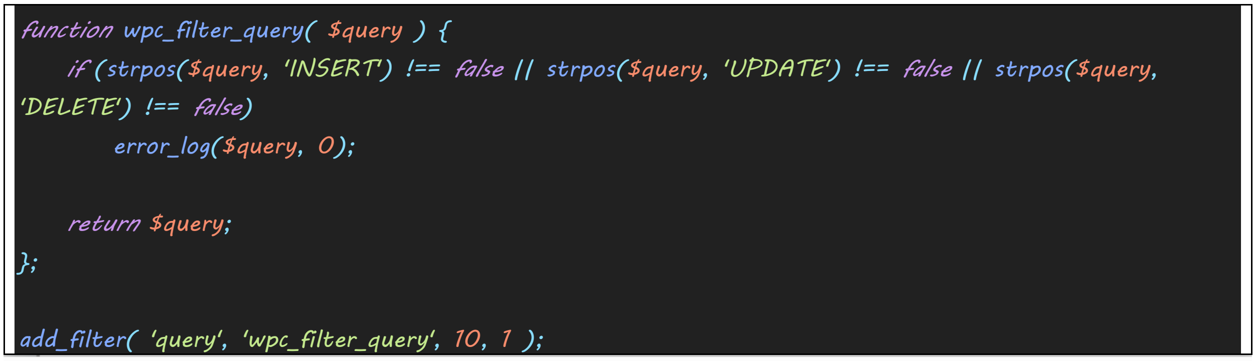


```
wampmysqld64, Version: 5.7.26-log (MySQL Community Server (GPL)). started with:
TCP Port: 3306, Named Pipe: /tmp/mysql.sock
Time                 Id Command    Argument
2019-09-10T12:50:27.941743Z         2 Connect   root@localhost on  using TCP/IP
2019-09-10T12:50:27.942413Z         2 Query     SET NAMES utf8mb4
2019-09-10T12:50:27.943174Z         2 Query     SET NAMES 'utf8mb4' COLLATE 'utf8mb4_unicode_520_ci'
2019-09-10T12:50:27.943430Z         2 Query     SELECT @@SESSION.sql_mode
2019-09-10T12:50:27.944101Z         2 Query     SET SESSION sql_mode='NO_ZERO_IN_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_AUTO_CREATE_USER'
2019-09-10T12:50:27.944805Z         2 Init DB   wp-1
```

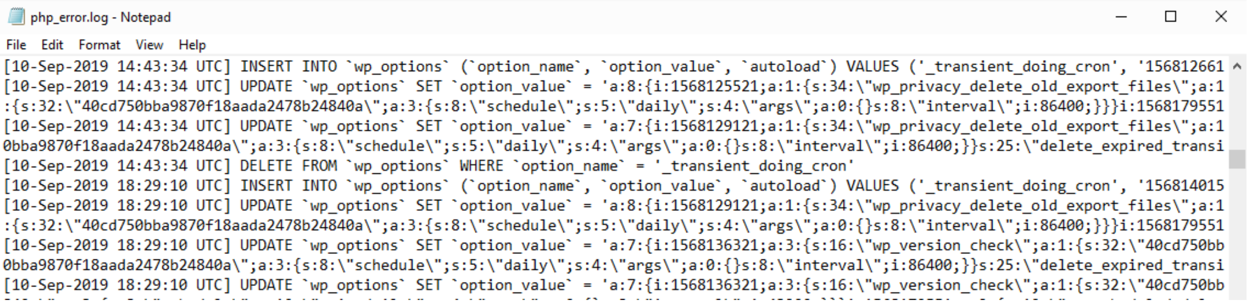
Screenshot of stored queries

3.6.2 Using PHP Function to Customize the Storage of Queries

Pasting following code in *wp-include/functions.php* will store all the queries containing the keywords: INSERT, DELETE, UPDATE in log file located at *wamp64/logs/php_error.log*



```
function wpc_filter_query( $query ) {
    if (strpos($query, ‘INSERT’) !== false || strpos($query, ‘UPDATE’) !== false || strpos($query,
‘DELETE’) !== false)
        error_log($query, 0);

    return $query;
};

add_filter( ‘query‘, ‘wpc_filter_query‘, 10, 1 );
```



```
[10-Sep-2019 14:43:34 UTC] INSERT INTO `wp_options` (`option_name`, `option_value`, `autoload`) VALUES ('_transient_doing_cron', '156812661
[10-Sep-2019 14:43:34 UTC] UPDATE `wp_options` SET `option_value` = 'a:8:{i:1568125521;a:1:{s:34:\"wp_privacy_delete_old_export_files\";a:1
:{s:32:\"40cd750bba9870f18aada2478b24840a\";a:3:{s:8:\"schedule\";s:5:\"daily\";s:4:\"args\";a:0:{}s:8:\"interval\";i:86400;}}}i:1568179551
[10-Sep-2019 14:43:34 UTC] UPDATE `wp_options` SET `option_value` = 'a:7:{i:1568129121;a:1:{s:34:\"wp_privacy_delete_old_export_files\";a:1
0bba9870f18aada2478b24840a\";a:3:{s:8:\"schedule\";s:5:\"daily\";s:4:\"args\";a:0:{}s:8:\"interval\";i:86400;}}s:25:\"delete_expired_transi
[10-Sep-2019 14:43:34 UTC] DELETE FROM `wp_options` WHERE `option_name` = '_transient_doing_cron'
[10-Sep-2019 18:29:10 UTC] INSERT INTO `wp_options` (`option_name`, `option_value`, `autoload`) VALUES ('_transient_doing_cron', '156814015
[10-Sep-2019 18:29:10 UTC] UPDATE `wp_options` SET `option_value` = 'a:8:{i:1568129121;a:1:{s:34:\"wp_privacy_delete_old_export_files\";a:1
:{s:32:\"40cd750bba9870f18aada2478b24840a\";a:3:{s:8:\"schedule\";s:5:\"daily\";s:4:\"args\";a:0:{}s:8:\"interval\";i:86400;}}}i:1568179551
[10-Sep-2019 18:29:10 UTC] UPDATE `wp_options` SET `option_value` = 'a:7:{i:1568136321;a:3:{s:16:\"wp_version_check\";a:1:{s:32:\"40cd750bb
0bba9870f18aada2478b24840a\";a:3:{s:8:\"schedule\";s:5:\"daily\";s:4:\"args\";a:0:{}s:8:\"interval\";i:86400;}}s:25:\"delete_expired_transi
[10-Sep-2019 18:29:10 UTC] UPDATE `wp_options` SET `option_value` = 'a:7:{i:1568136321;a:3:{s:16:\"wp_version_check\";a:1:{s:32:\"40cd750bb
```

Screenshot of php_error.log file after refreshing the page

3.7 Overview Of Multisite Wordpress Installation

Wordpress network or wordpress multiside installation offers capabilities to run multiple blogs on a single domain. Multiple blogs mean multiple and different themes, plugins and databases running on different sub-domains or directories. Another benefit is having different admins for each site on the network.

Although the activated themes and plugins being used by sites on network may differ but all of those are shared in the network. Separate installations are not needed.

Database Structure of Multisite Wordpress

In multisite wordpress, tables are replicated with different names when more than 1 more blog is used. For example:

wp_posts table for 2nd blog becomes wp_2_posts. Similiarly, all other tables for 2nd blog are named. For third blog it will be wp_3_posts and so on.

Besides replication of previously discussed tables, following tables are added in the database:

wp_site	Stores the network details. If more than one network exists on wordpress than this table will have more than one records.
wp_sitemeta	Stores the options and settings related to network. Its purpose is similar to wp_options table.
wp_registration_log	Stores the admin details of each site.

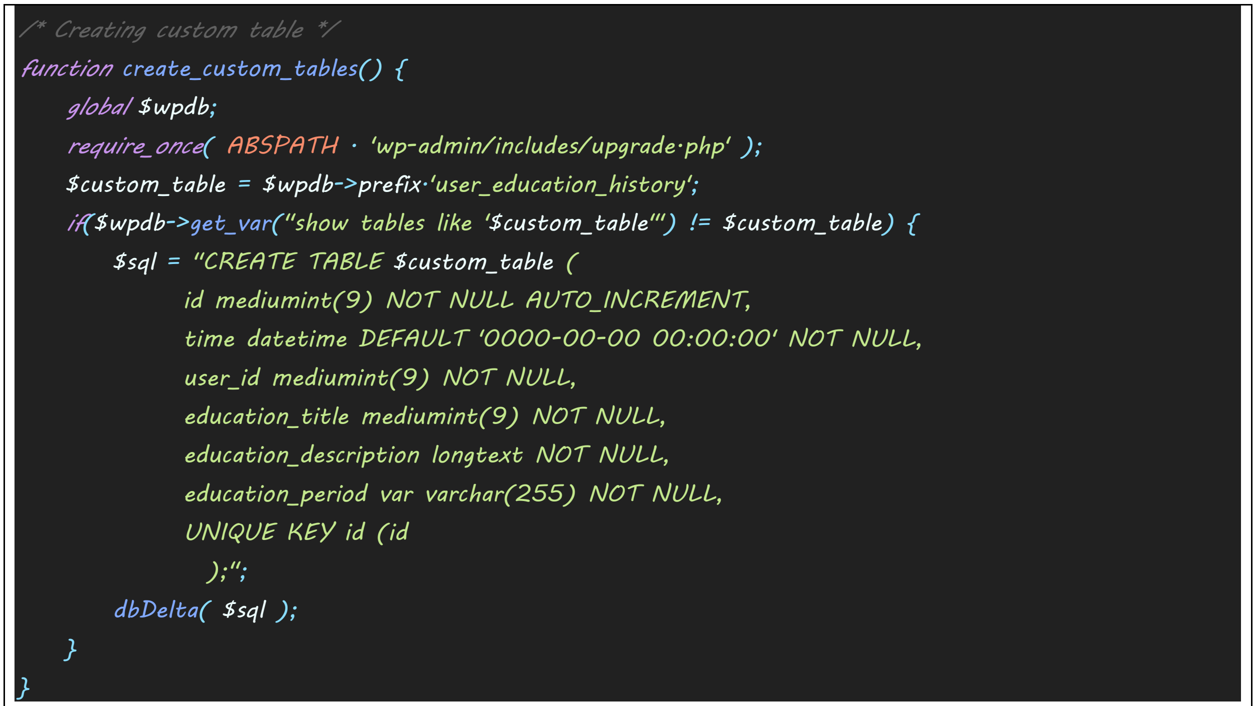
wp_blogs	This table is primary storage for the information relevant to mutliple blogs. It stores the domain, date of creation, and other information relevant to a blog.
wp_blog_versions	Stores the current database versions of all the sites in the network.
wp_signups	Stores the details of registered users, same details are also stored in wp_users table of respective site.

These tables are not replicated for additional blogs, rather these belong to the network(s) itself. These tables store the information relevant to different blogs on the network(s).

3.8 Creating Custom Tables and Handling Data in Tables

3.8.1 Custom Table Creation

Wordpress does support custom data storage in its tables but sometimes we need to create new tables to store large set of information and to implement new plugins. To create table, we can write our own PHP function using the dbDelta() function provided in includes/upgrade.php file in wordpress. Syntax to create a table to store the education history of a user is given below.



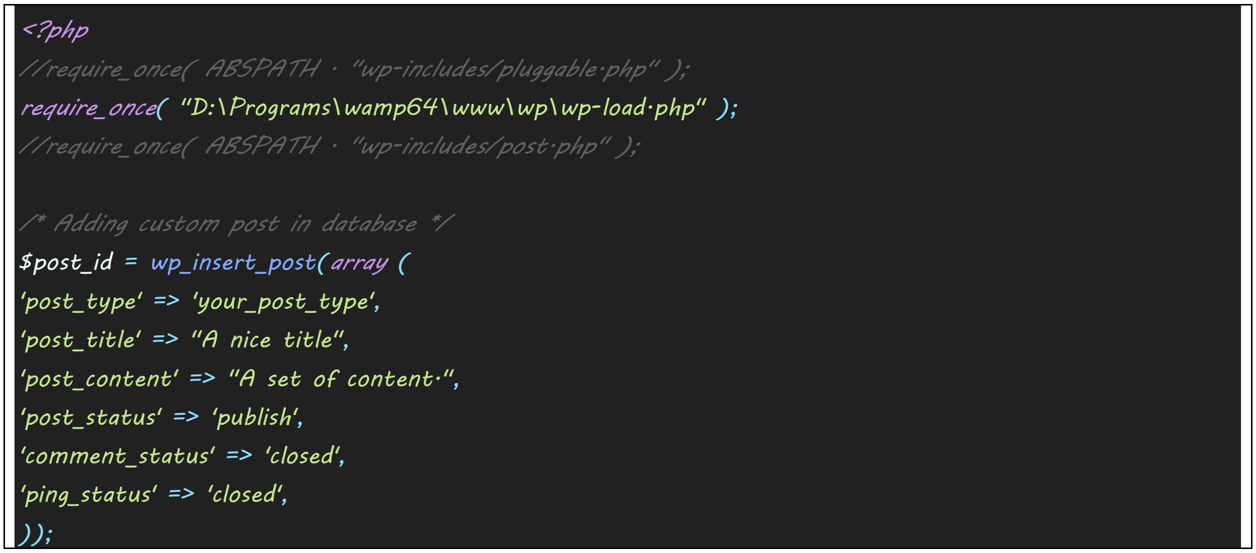
```
/* Creating custom table */
function create_custom_tables() {
    global $wpdb;
    require_once( ABSPATH . ‘wp-admin/includes/upgrade.php‘ );
    $custom_table = $wpdb->prefix.‘user_education_history‘;
    if($wpdb->get_var(“show tables like ‘$custom_table‘”) != $custom_table) {
        $sql = “CREATE TABLE $custom_table (
               id mediumint(9) NOT NULL AUTO_INCREMENT,
               time datetime DEFAULT ‘0000-00-00 00:00:00‘ NOT NULL,
               user_id mediumint(9) NOT NULL,
               education_title mediumint(9) NOT NULL,
               education_description longtext NOT NULL,
               education_period var varchar(255) NOT NULL,
               UNIQUE KEY id (id
                 );“;
        dbDelta( $sql );
    }
}
```

3.8.2 CRUD Operations on Built-in Tables

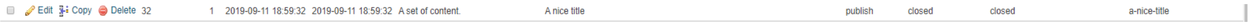
3.8.2.1 Inserting Records

Wordpress offers built-in functions to insert data into the tables. It is recommended to use those functions to prevent insertion of malicious code in the database. Some of tem are mentioned below. These functions also support array of records to be stored in a certain table.

wp_insert_post(array $postarr, bool $wp_error = false)
It is used to add new post/page in the wp_posts table. An array of posts can be passed to it to create/replace multiple posts.



```
<?php
//require_once( ABSPATH . "wp-includes/pluggable.php" );
require_once( "D:\Programs\wamp64\www\wp\wp-load.php" );
//require_once( ABSPATH . "wp-includes/post.php" );

/* Adding custom post in database */
$post_id = wp_insert_post(array (
'post_type' => 'your_post_type',
'post_title' => "A nice title",
'post_content' => "A set of content.",
'post_status' => 'publish',
'comment_status' => 'closed',
'ping_status' => 'closed',
));
```



```
□ Edit Copy Delete 32    1  2019-09-11 18:59:32  2019-09-11 18:59:32  A set of content.    A nice title    publish  closed  closed  a-nice-title
```

Similiarly, we can use below mentioned functions for other tables.

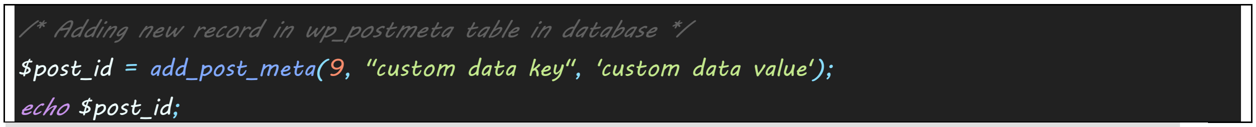
add_option($option, $value, $deprecated, $autoload)
It adds a new record in wp_options table. As we discussed earlier, this table can store custom key-value pairs.

wp_insert_user(array|object|WP_User $userdata)
It can be used to add more users in wp_users table.

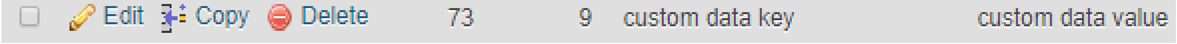
3.8.2.2 Updating Records

Wordpress has built-in methods to update records. Some of them are mentioned below:

update_post_meta(int $post_id, string $meta_key, mixed $meta_value, mixed $prev_value = '')
Creates to updates the details of a post in wp_postsmeta table.



```
/* Adding new record in wp_postmeta table in database */
$post_id = add_post_meta(9, "custom data key", 'custom data value');
echo $post_id;
```



```
□ Edit Copy Delete    73    9    custom data key    custom data value
```

Similarly, we can use below mentioned functions.

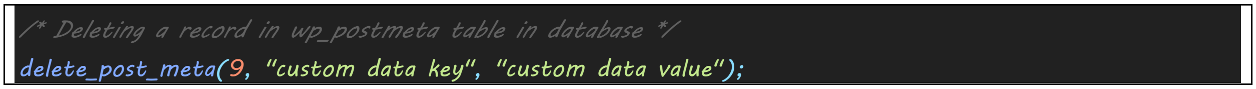
wp_update_term(int $term_id, string $taxonomy, array|string $args = array())
Updates the term information in wp_update_term.

update_user_meta(int $user_id, string $meta_key, mixed $meta_value, mixed $prev_value = '')
Updates the user meta details in wp_usermeta table.

3.8.2.3 Deleting Records

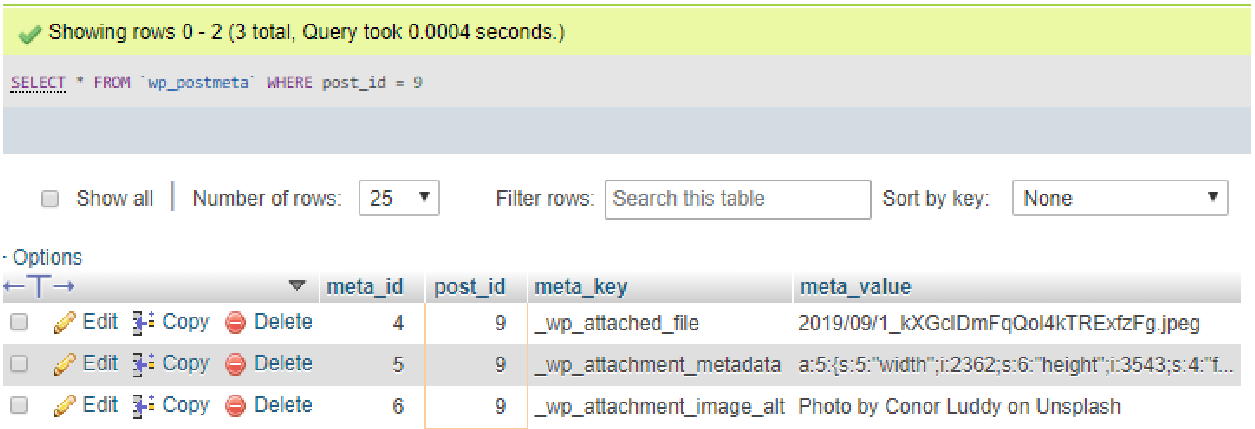
Functions provided to delete the records from the wordpress tables are discussed below.

delete_post_meta($post_id, $meta_key, $meta_value);



```
/* Deleting a record in wp_postmeta table in database */
delete_post_meta(9, “custom data key”, “custom data value”);
```

Record deleted as it is no more listed in records associated with post ID 9.



✓ Showing rows 0 - 2 (3 total, Query took 0.0004 seconds.)

```
SELECT * FROM `wp_postmeta` WHERE post_id = 9
```

←T→ ▼	meta_id	post_id	meta_key	meta_value
☐ Edit Copy Delete	4	9	_wp_attached_file	2019/09/1_kXGclDmFqQol4kTRExfzFg.jpeg
☐ Edit Copy Delete	5	9	_wp_attachment_metadata	a:5:{s:5:"width";i:2362;s:6:"height";i:3543;s:4:"f...
☐ Edit Copy Delete	6	9	_wp_attachment_image_alt	Photo by Conor Luddy on Unsplash

Similarly, we can use:

wp_delete_post(int $postid, bool $force_delete = false)

This removes existing pages, posts or attachments from the wp_posts table.

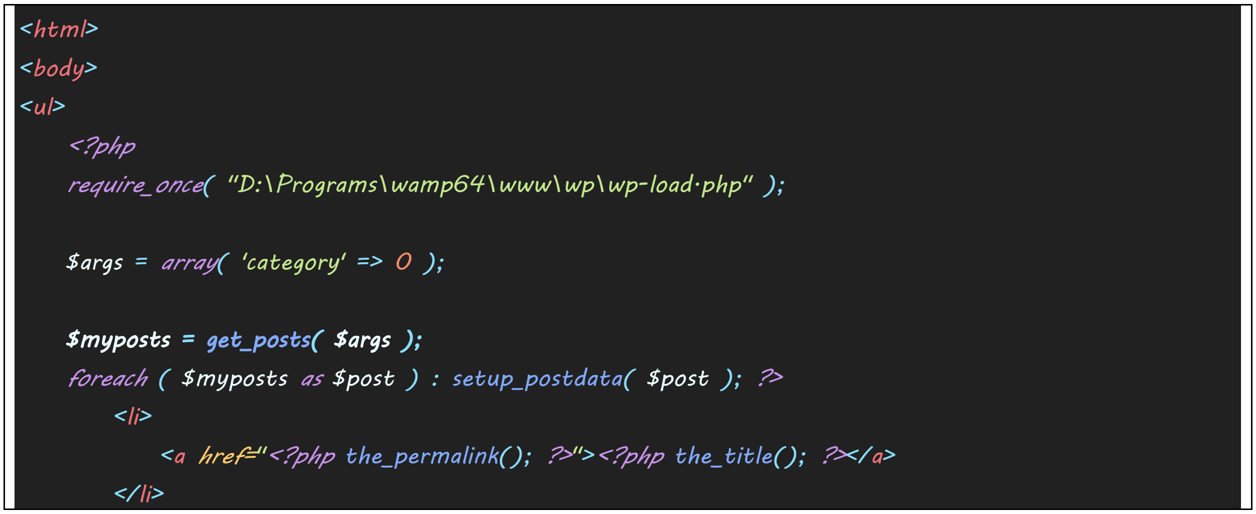
delete_user_meta(int $user_id, string $meta_key, mixed $meta_value = '')

This can be used to remove the information associated with a user from the wp_usermeta table.

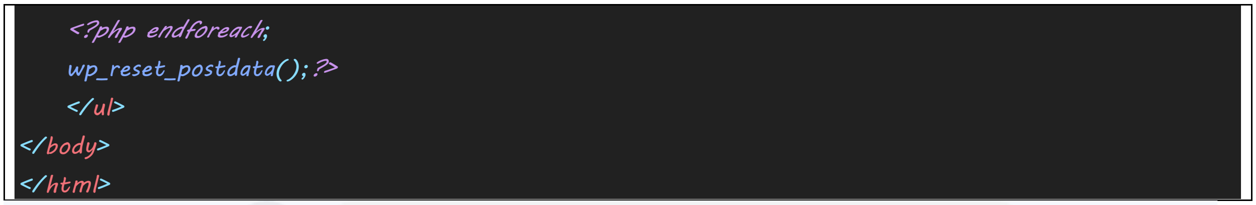
3.8.2.4 Selecting Records

Functions to select records from the database are also provided in wordpress. Some of them are discussed below.

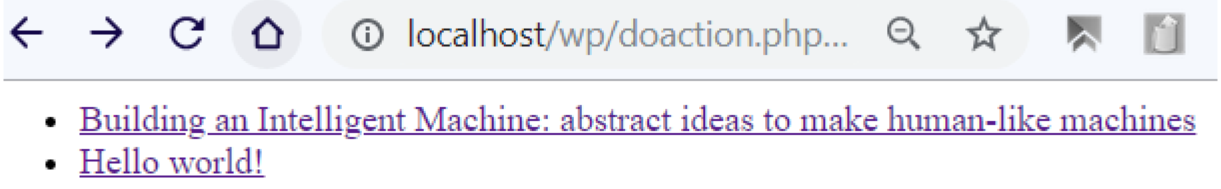
get_posts(array $args = null)



```
<html>
<body>
<ul>
    <?php
    require_once( “D:\Programs\wamp64\www\wp\wp-load.php” );

    $args = array( 'category' => 0 );

    $myposts = get_posts( $args );
    foreach ( $myposts as $post ) : setup_postdata( $post ); ?>
        <li>
            <a href="<?php the_permalink(); ?>"><?php the_title(); ?></a>
        </li>
```



```
    <?php endforeach;
    wp_reset_postdata();?>
    </ul>
</body>
</html>
```



- Building an Intelligent Machine: abstract ideas to make human-like machines
- Hello world!

Similarly, we can use the following functions:

get_option(string $option, mixed $default = false)
This retrieves the option corresponding to given key in wp_options table.

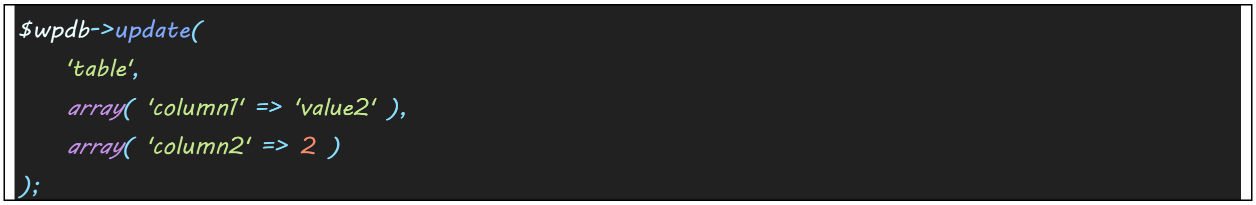
get_users(array $args = array())
This retrieves the users from the wp_users table.

3.8.3 CRUD Operations on Custom Tables

We can use **wpdb** class object to access all the tables within the database. It is available as global variable within all the plugin and theme files. It improves the security and optimizes the database queries.

3.8.3.1 Updating the Records

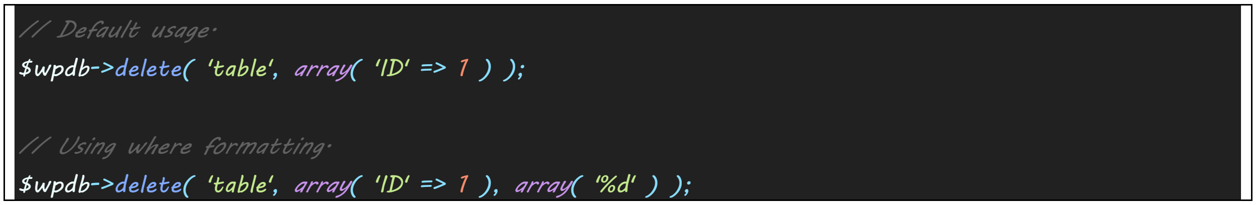
$wpdb->update() is used to update records within the custom tables.



```
$wpdb->update(
    'table',
    array( 'column1' => 'value2' ),
    array( 'column2' => 2 )
);
```

3.8.3.2 Deleting the Records

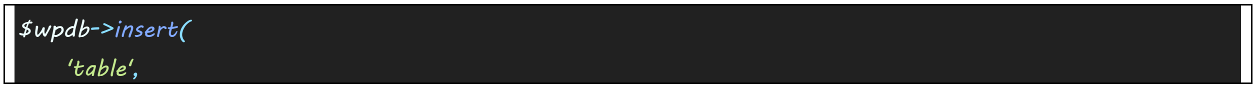
$wpdb->delete($table, $where, $where_format = null);



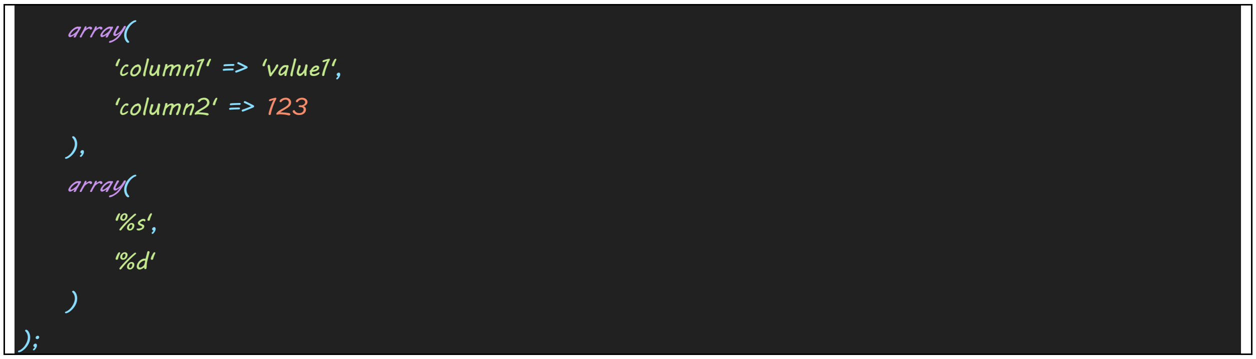
```
// Default usage.
$wpdb->delete( 'table', array( 'ID' => 1 ) );

// Using where formatting.
$wpdb->delete( 'table', array( 'ID' => 1 ), array( '%d' ) );
```

3.8.3.3 Inserting new Records

$wpdb->insert($table, $data, $format);



```
$wpdb->insert(
    'table',
```

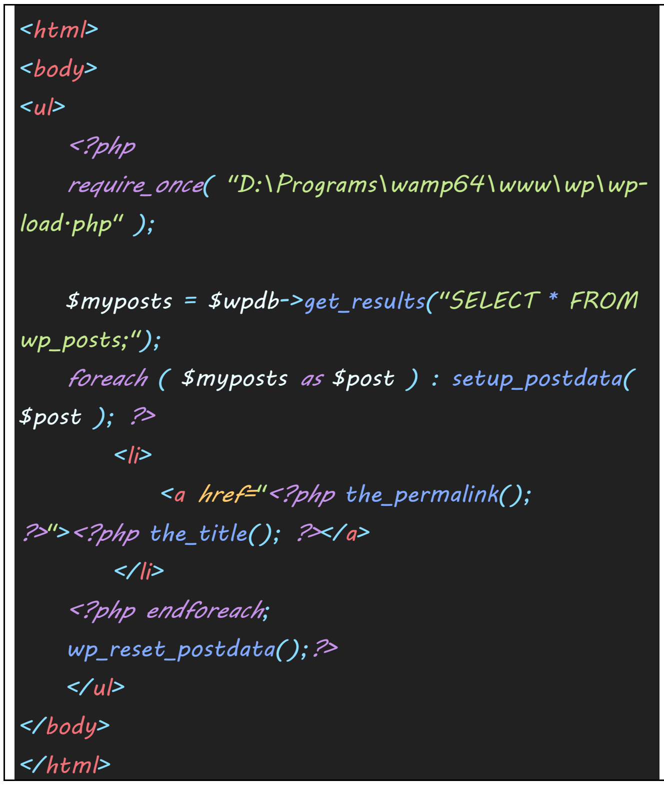


```
    array(
        'column1' => 'value1',
        'column2' => 123
    ),
    array(
        '%s',
        '%d'
    )
);
```

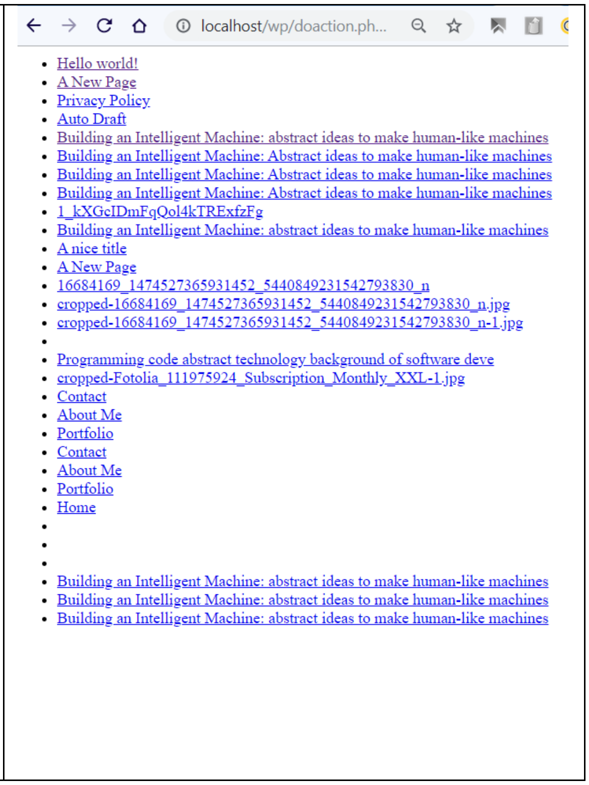
3.8.3.4 Selecting the Records

There are many functions available to access records from the custom tables. Not only custom tables, those functions work with default tables too. Let's look into some functions.

$wpdb->get_results(String Query);



```
<html>
<body>
<ul>
    <?php
    require_once( "D:\Programs\wamp64\www\wp\wp-
load.php" );

    $myposts = $wpdb->get_results("SELECT * FROM
wp_posts;");
    foreach ( $myposts as $post ) : setup_postdata(
$post ); ?>
        <li>
            <a href="<?php the_permalink();
?>"><?php the_title(); ?></a>
        </li>
    <?php endforeach;
    wp_reset_postdata();?>
    </ul>
</body>
</html>
```



```
• Hello world!
• A New Page
• Privacy Policy
• Auto Draft
• Building an Intelligent Machine: abstract ideas to make human-like machines
• Building an Intelligent Machine: Abstract ideas to make human-like machines
• Building an Intelligent Machine: Abstract ideas to make human-like machines
• Building an Intelligent Machine: Abstract ideas to make human-like machines
• 1_kXGcIDmFqQol4kTRExfzFg
• Building an Intelligent Machine: abstract ideas to make human-like machines
• A nice title
• A New Page
• 16684169_1474527365931452_5440849231542793830_n
• cropped-16684169_1474527365931452_5440849231542793830_n.jpg
• cropped-16684169_1474527365931452_5440849231542793830_n-1.jpg
•
• Programming code abstract technology background of software deve
• cropped-Fotolia_111975924_Subscription_Monthly_XXL-1.jpg
• Contact
• About Me
• Portfolio
• Contact
• About Me
• Portfolio
• Home
•
•
•
• Building an Intelligent Machine: abstract ideas to make human-like machines
• Building an Intelligent Machine: abstract ideas to make human-like machines
• Building an Intelligent Machine: abstract ideas to make human-like machines
```

Similarly, we can use:

$wpdb->query('query')

This returns the updated rows as a result. That's why it is used to update or delete the records.

$wpdb->get_row('query')

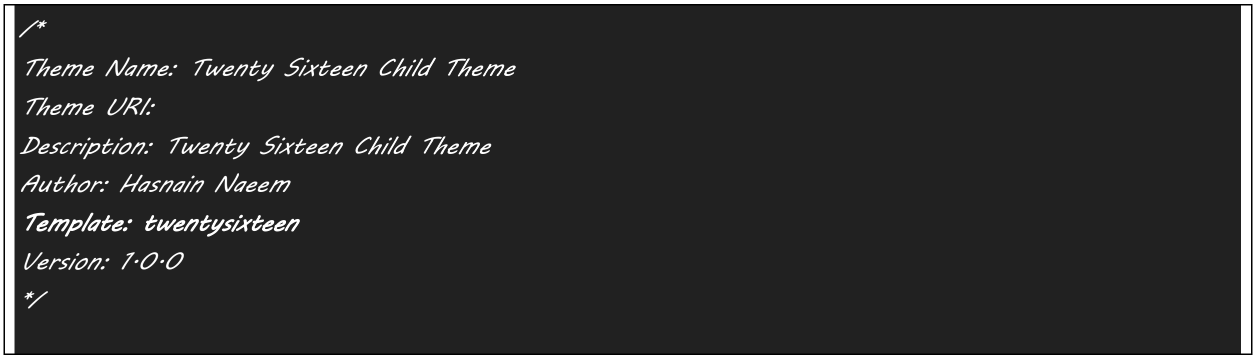
This can be used to get a single row from the database as an array (associative or numerical).

3.9 Customizing the Wordpress Themes

Wordpress themes are customizable, this is usually done by making a child theme. A child theme has the same features as a parent theme and it is a different theme in itself. Features of parent theme can be extended and overwritten. Child themes are used for customization because actual theme changes are lost during theme update.

3.9.1 Creating a Child Theme

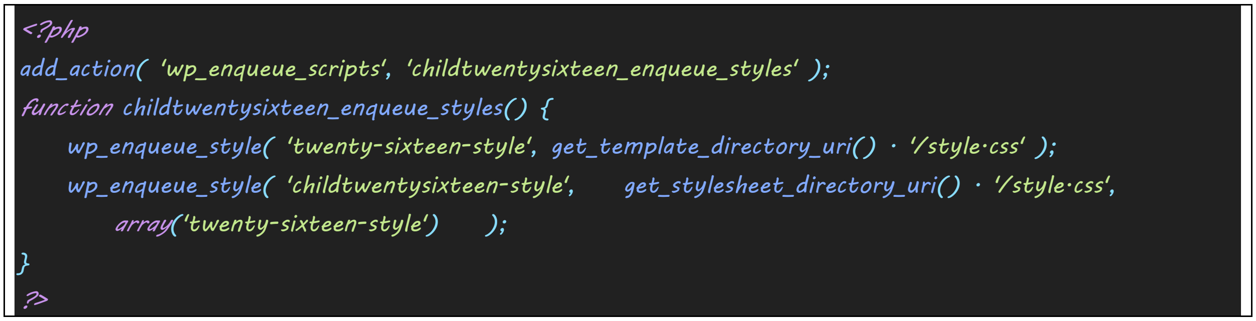
We need to create a directory for child theme in wp-content/themes directory. Afterward, a style.css file is added in it to define its parent theme by copying this code:



```
/*
Theme Name: Twenty Sixteen Child Theme
Theme URI:
Description: Twenty Sixteen Child Theme
Author: Hasnain Naeem
Template: twentysixteen
Version: 1.0.0
*/
```

Highlighted line defines the parent theme.

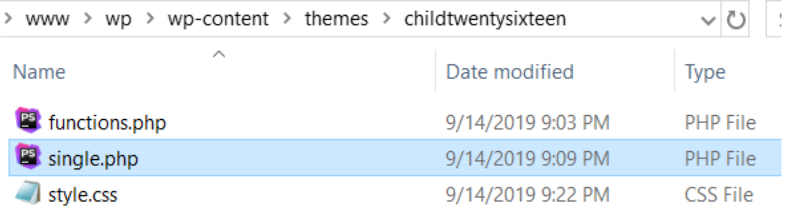
Moreover, we have to add a functions.php file with the following code to import the style.css file of parent theme into the child theme to be overwritten and extended:



```
<?php
add_action( 'wp_enqueue_scripts', 'childtwentysixteen_enqueue_styles' );
function childtwentysixteen_enqueue_styles() {
    wp_enqueue_style( 'twenty-sixteen-style', get_template_directory_uri() . '/style.css' );
    wp_enqueue_style( 'childtwentysixteen-style',    get_stylesheet_directory_uri() . '/style.css',
        array('twenty-sixteen-style')    );
}
?>
```

3.9.2 Customizing a Child Theme

Customization can be done by copy pasting a file from the parent theme directory into the child theme directory. For example, if we want to change customize the post/page in our theme, we'll have to copy single.php file into the theme directory, as shown in following image:



› www › wp › wp-content › themes › childtwentysixteen

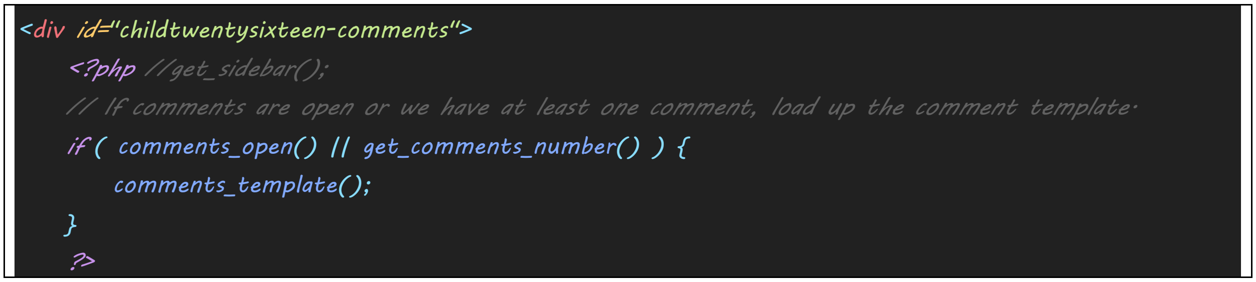
Name	Date modified	Type
functions.php	9/14/2019 9:03 PM	PHP File
single.php	9/14/2019 9:09 PM	PHP File
style.css	9/14/2019 9:22 PM	CSS File

To determine the files to be customized we can use “What the File” plugin we previously installed, by visiting a certain page in our browser and getting the names of associated files.

Suppose, we want to remove the sidebar and move the comment section in its place. Also, we want to change the width of content area.

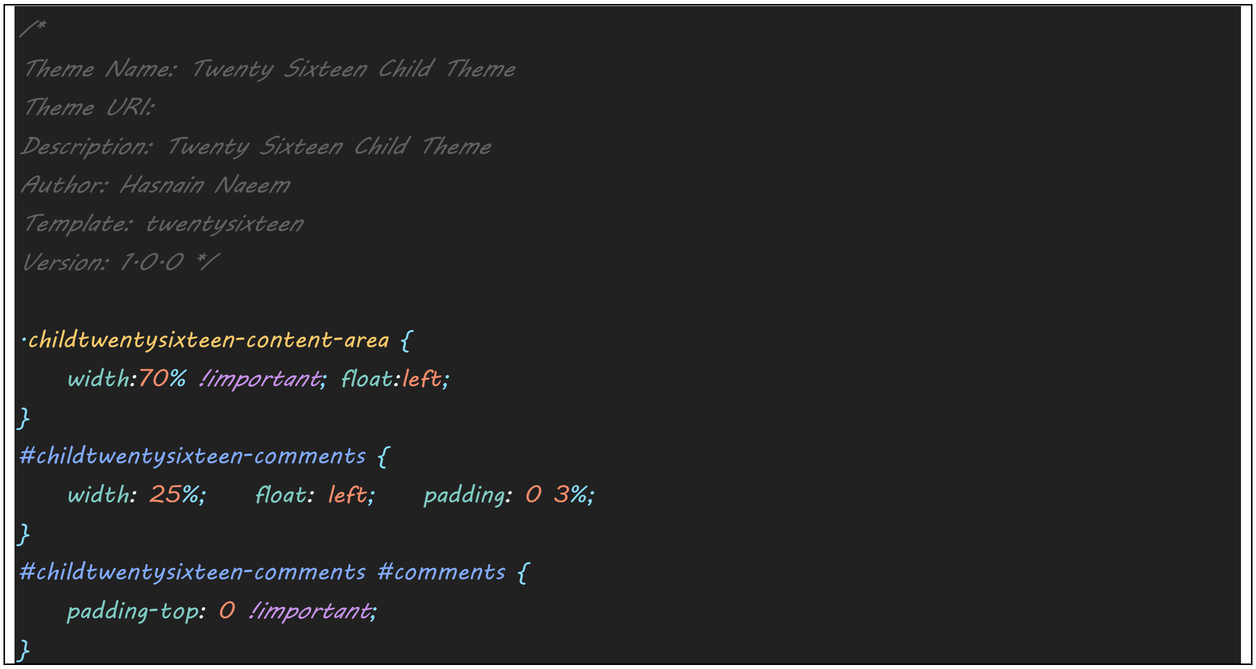
For that we can edit the single.php file and remove the code for sidebar and move the comments code in it.

Finally, our sidebar code will look like this:



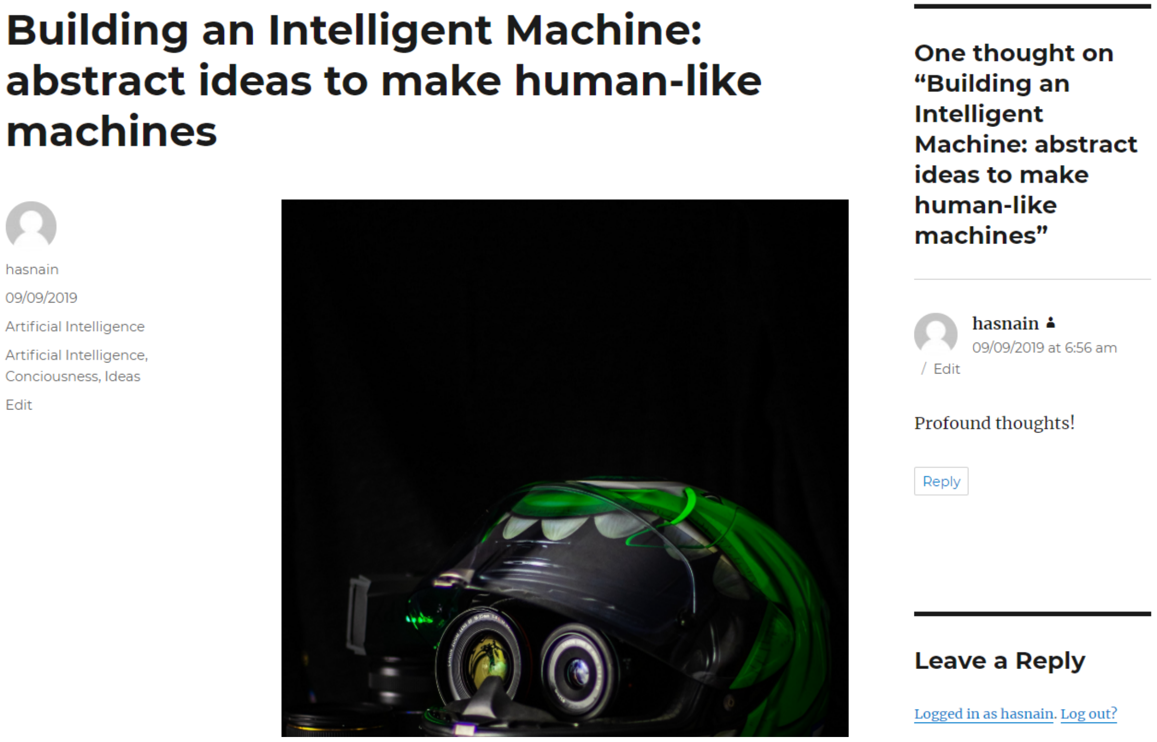
```
<div id=“childtwentysixteen-comments“>
    <?php //get_sidebar();
    // If comments are open or we have at least one comment, load up the comment template.
    if ( comments_open() || get_comments_number() ) {
        comments_template();
    }
    ?>
```

Now, we can change the content width by adding the following code in our child theme’s style.css file:



```
/*
Theme Name: Twenty Sixteen Child Theme
Theme URI:
Description: Twenty Sixteen Child Theme
Author: Hasnain Naeem
Template: twentysixteen
Version: 1.0.0 */

.childtwentysixteen-content-area {
    width:70% !important; float:left;
}
#childtwentysixteen-comments {
    width: 25%;     float: left;     padding: 0 3%;
}
#childtwentysixteen-comments #comments {
    padding-top: 0 !important;
}
```

Finally, after activating our child theme from the admin panel, our posts page will look like this:



Building an Intelligent Machine: abstract ideas to make human-like machines

hasnain

09/09/2019

Artificial Intelligence

Artificial Intelligence, Conciousness, Ideas

Edit

One thought on "Building an Intelligent Machine: abstract ideas to make human-like machines"

hasnain

09/09/2019 at 6:56 am

/ Edit

Profound thoughts!

Reply

Leave a Reply

Logged in as hasnain. Log out?

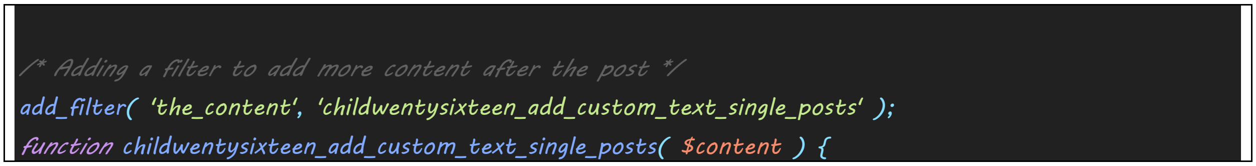
3.9.3 Extending Features using Filters and Actions

Special kind of functions are called filters and actions in wordpress. Filter is a function which modifies the data and features in a process. On the other hand, action is a function executed at a specific point in a process (before and after certain events).

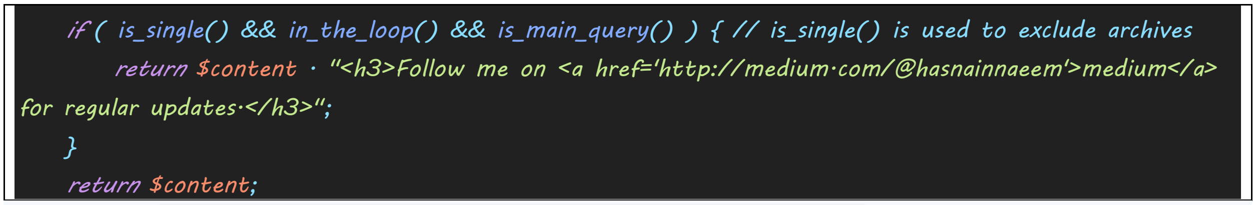
Some common filters and actions are discussed below:

the_content: used to modify the content of the post by adding more content before or after the post. It can be used to add content to article or to add HTML elements. For example, more posts, sharing buttons, etc.

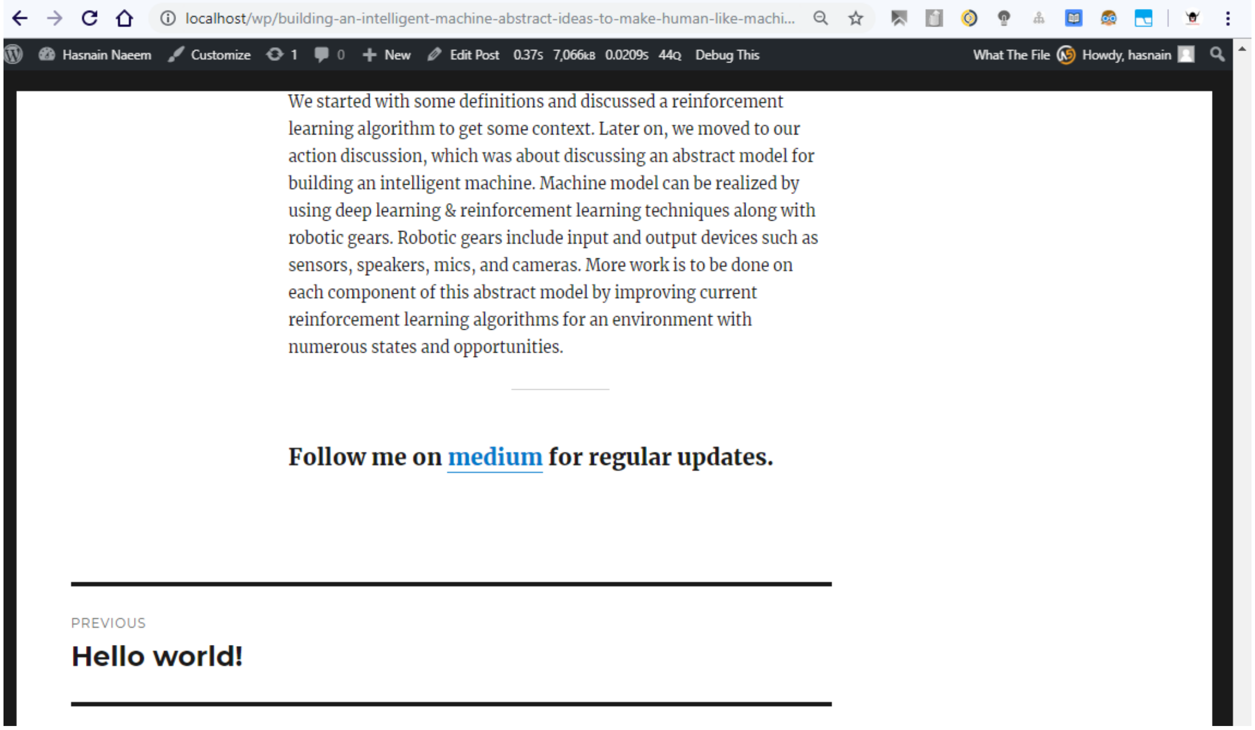
We can add following code in functions.php file to utilize the_content hook to add more content at the end of the posts:



```
/* Adding a filter to add more content after the post */
add_filter( 'the_content', 'childwentysixteen_add_custom_text_single_posts' );
function childwentysixteen_add_custom_text_single_posts( $content ) {
```



```
    if ( is_single() && in_the_loop() && is_main_query() ) { // is_single() is used to exclude archives
        return $content . "<h3>Follow me on <a href='http://medium.com/@hasnainnaeem'>medium</a>
for regular updates.</h3>";
    }
    return $content;
```



We started with some definitions and discussed a reinforcement learning algorithm to get some context. Later on, we moved to our action discussion, which was about discussing an abstract model for building an intelligent machine. Machine model can be realized by using deep learning & reinforcement learning techniques along with robotic gears. Robotic gears include input and output devices such as sensors, speakers, mics, and cameras. More work is to be done on each component of this abstract model by improving current reinforcement learning algorithms for an environment with numerous states and opportunities.

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PREVIOUS

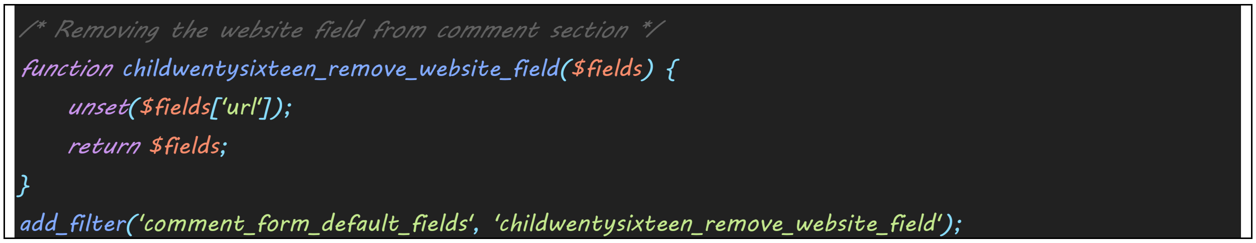
Hello world!

Similarly, we can use following hooks:

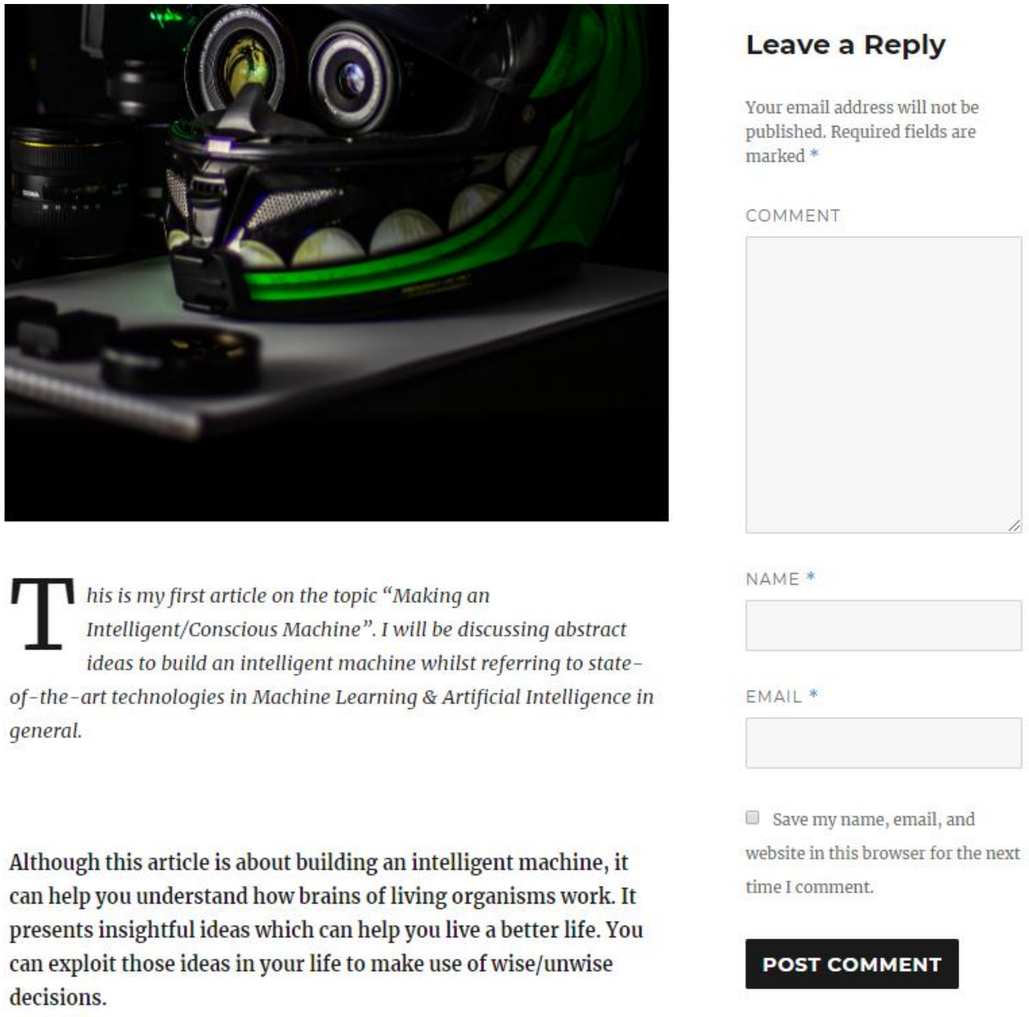
the_permalink: to alter the link of the post.

the_title: used to modify the title of the post.

comment_form_default_fields: this can be used to modify the comment section fields.



```
/* Removing the website field from comment section */
function childwentysixteen_remove_website_field($fields) {
    unset($fields['url']);
    return $fields;
}
add_filter('comment_form_default_fields', 'childwentysixteen_remove_website_field');
```



This is my first article on the topic "Making an Intelligent/Conscious Machine". I will be discussing abstract ideas to build an intelligent machine whilst referring to state-of-the-art technologies in Machine Learning & Artificial Intelligence in general.

Although this article is about building an intelligent machine, it can help you understand how brains of living organisms work. It presents insightful ideas which can help you live a better life. You can exploit those ideas in your life to make use of wise/unwise decisions.

Leave a Reply

Your email address will not be published. Required fields are marked *

COMMENT

NAME *

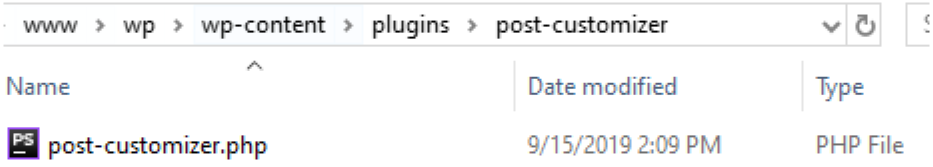
EMAIL *

□ Save my name, email, and website in this browser for the next time I comment.

POST COMMENT

3.10 Creating Plugins For Wordpress

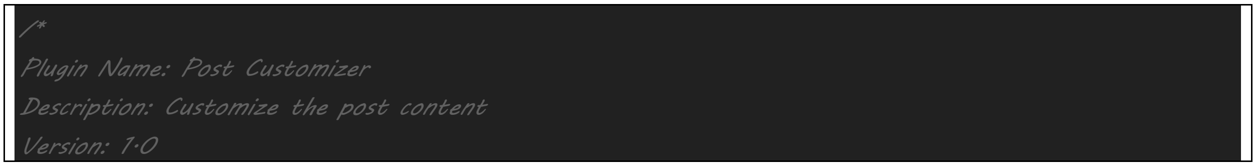
We can create plugin by creating a directory in wp-content/plugins and a php file with the same name. For example, let us create a plugin to customize the post content.



www › wp › wp-content › plugins › post-customizer

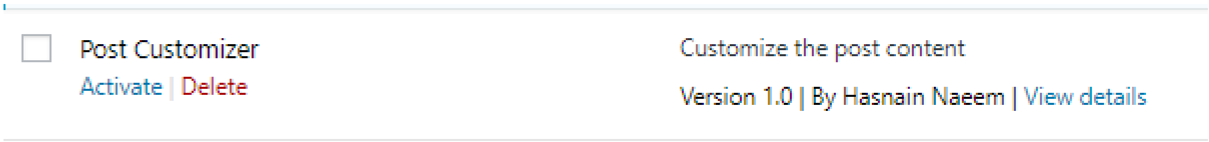
Name	Date modified	Type
post-customizer.php	9/15/2019 2:09 PM	PHP File

Afterward, we have to add the following code to initialize the plugin (just as we did for child theme):



```
/*
Plugin Name: Post Customizer
Description: Customize the post content
Version: 1.0
```

```
Author: Hasnain Naeem
*/
```



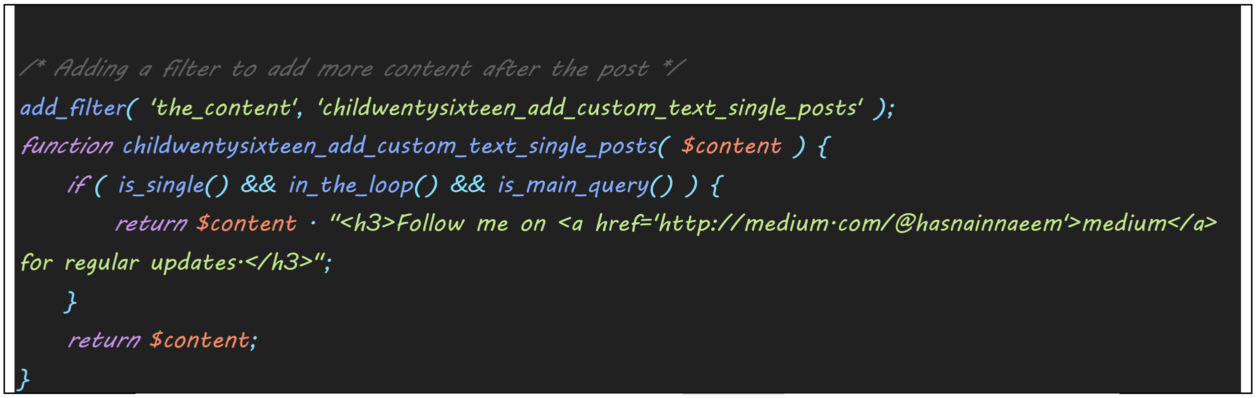
□ Post Customizer

Activate | Delete

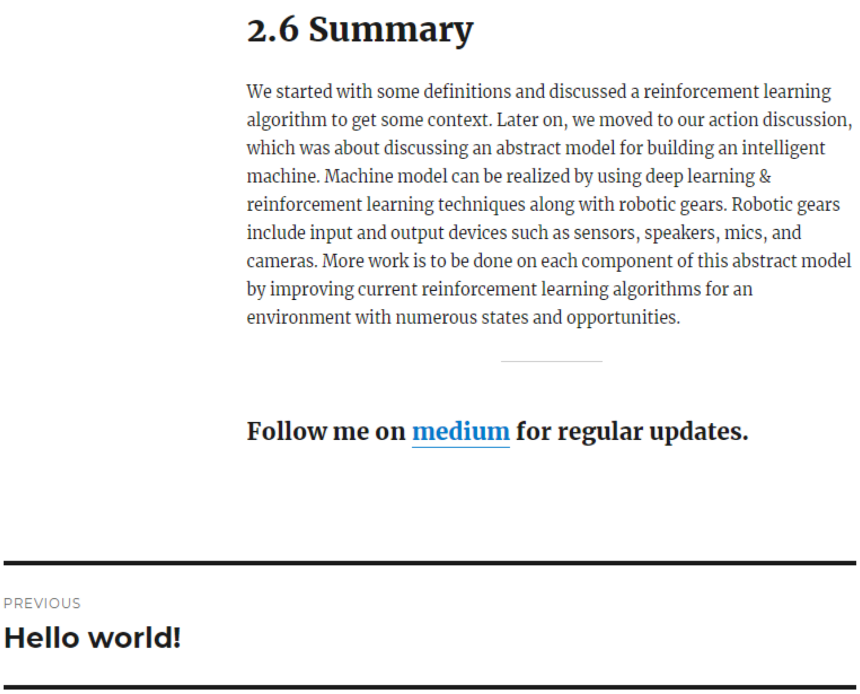
Customize the post content

Version 1.0 | By Hasnain Naeem | View details

Now, we can add functionality to plugin using the actions and hooks provided by Wordpress and theme. Let us add more content at the end of the post using plugin. For that we can reuse our previous code (after deleting our previously used code in functions.php):



```
/* Adding a filter to add more content after the post */
add_filter( ‘the_content’, ‘childwentysixteen_add_custom_text_single_posts’ );
function childwentysixteen_add_custom_text_single_posts( $content ) {
    if ( is_single() && in_the_loop() && is_main_query() ) {
        return $content . “<h3>Follow me on <a href=‘http://medium.com/@hasnainnaeem’>medium</a>
for regular updates.</h3>”;
    }
    return $content;
}
```



2.6 Summary

We started with some definitions and discussed a reinforcement learning algorithm to get some context. Later on, we moved to our action discussion, which was about discussing an abstract model for building an intelligent machine. Machine model can be realized by using deep learning & reinforcement learning techniques along with robotic gears. Robotic gears include input and output devices such as sensors, speakers, mics, and cameras. More work is to be done on each component of this abstract model by improving current reinforcement learning algorithms for an environment with numerous states and opportunities.

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4 REFERENCES

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