

ICT171

ASSIGNMENT 2

CLOUD PROJECT

DOCUMENTATION

<https://bookreviewblog.online>

<http://52.184.146.50/>

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Server Documentation

This section follows the creation of a virtual machine on azure and connecting to the SSH Client

Creating virtual machine

1. Click on “Virtual machines” >> create an Azure virtual machine.

You will have to set the following details according as presented in the screenshots.

My vm is configured to the following specifications:

- Image Type (OS): Ubuntu Server 22.04 LTS x64 Gen2
- VM Size (SKU): Standard B1s, 1 vCPU, 1 GiB RAM
- Disk Type: Standard SSD

Home > Free services >

Create a virtual machine

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ Azure subscription 1

Resource group * ⓘ (New) Assignment2_BookReviewBlog
[Create new](#)

Instance details

Virtual machine name * ⓘ BookReviewBlog ✓

Region * ⓘ (US) East US 2

Image * ⓘ Ubuntu Server 22.04 LTS - x64 Gen2 (free services eligible)

< Previous Next : Tags > Review + create

i You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription.
[Learn more](#)

Size * ⓘ

Administrator account

Authentication type ⓘ

Standard_B1s - 1 vcpu, 1 GiB memory (\$7.59/month) (free services eligible)	✓
Standard_B1s - 1 vcpu, 1 GiB memory (\$7.59/month) (free services eligible)	
Free services eligible sizes	
Standard_B1s - 1 vcpu, 1 GiB memory (\$7.59/month) (free services eligible)	
Standard_B2ats_v2 - 2 vcpus, 1 GiB memory (\$6.86/month) (free services eligible)	

Set SSH public key

Authentication type ⓘ	<input checked="" type="radio"/> SSH public key <input type="radio"/> Password
	<div><p>i Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.</p></div>
Username * ⓘ	<input type="text" value="azureuser"/> ✓
SSH public key source	<input type="text" value="Generate new key pair"/> ▼
SSH Key Type	<input checked="" type="radio"/> RSA SSH Format <input type="radio"/> Ed25519 SSH Format <div><p>i Ed25519 provides a fixed security level of no more than 128 bits for 256-bit key, while RSA could offer better security with keys longer than 3072 bits.</p></div>
Key pair name *	<input type="text" value="trisha"/> ✓

Inbound rules settings

Allow access to the following ports:

- HTTP (Port 80)
- HTTPS (Port 443)
- SSH (Port 22)

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * ⓘ	<input type="radio"/> None <input checked="" type="radio"/> Allow selected ports
Select inbound ports *	<input type="text" value="HTTP (80), HTTPS (443), SSH (22)"/> ▼
<div><p>⚠ This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.</p></div>	

Review and finalization of VM creation

You should see the following detailing “validation passed” and costs on successfully creatingg

✓ Validation passed

Basics Tags **Review + create**

📘

Cost given below is an estimate and not the final price. For all your pricing needs, please use the pricing calculator.
[Pricing calculator](#)

Price

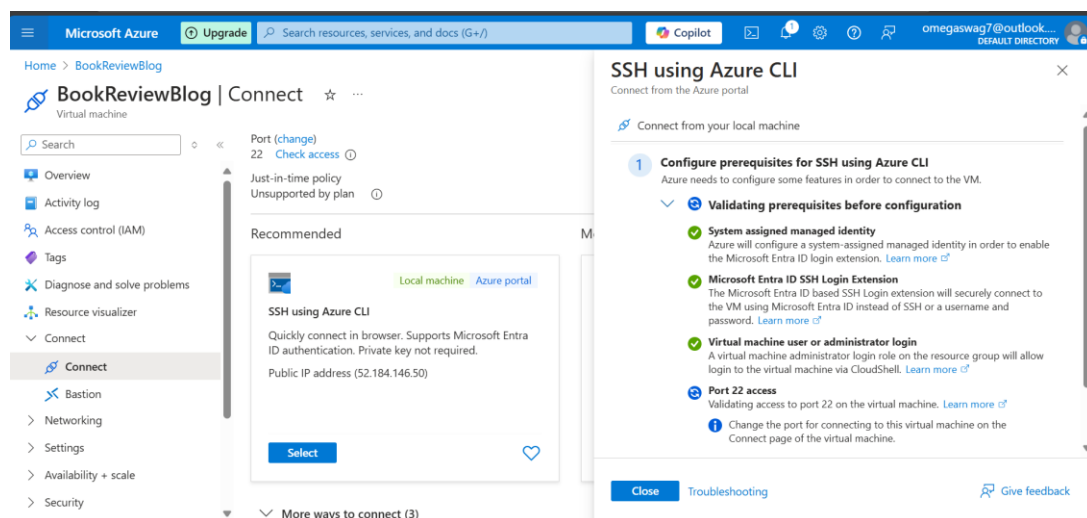
1 X Standard B1s
by Microsoft
[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ
0.0104 USD/hr
[Pricing for other VM sizes](#)

a vm

Connecting to SSH Azure CLI

1. Click on connect in the vms left panel
2. Click on select under the SSH using Azure Cli box



Administration privileges

For admin privileges within the powershell if not assigned by default run the following command:

az ssh vm --resource-group <RESOURCE_GROUP_NAME> --vm-name <VM_NAME>

eg. az ssh vm --resource-group Assignment2_BookReviewBlog --vm-name BookReviewBlog

INSTALLING PACKAGES AND UPDATES

Setting apache

```
sudo apt install apache2 -y
```

```
sudo apt update
```

```
sudo systemctl status apache2
```

Install php mysql and

```
sudo apt install lamp-server^
```

check download

```
apache2 -v
```

mount Storage

```
sudo umount /var/www/html
```

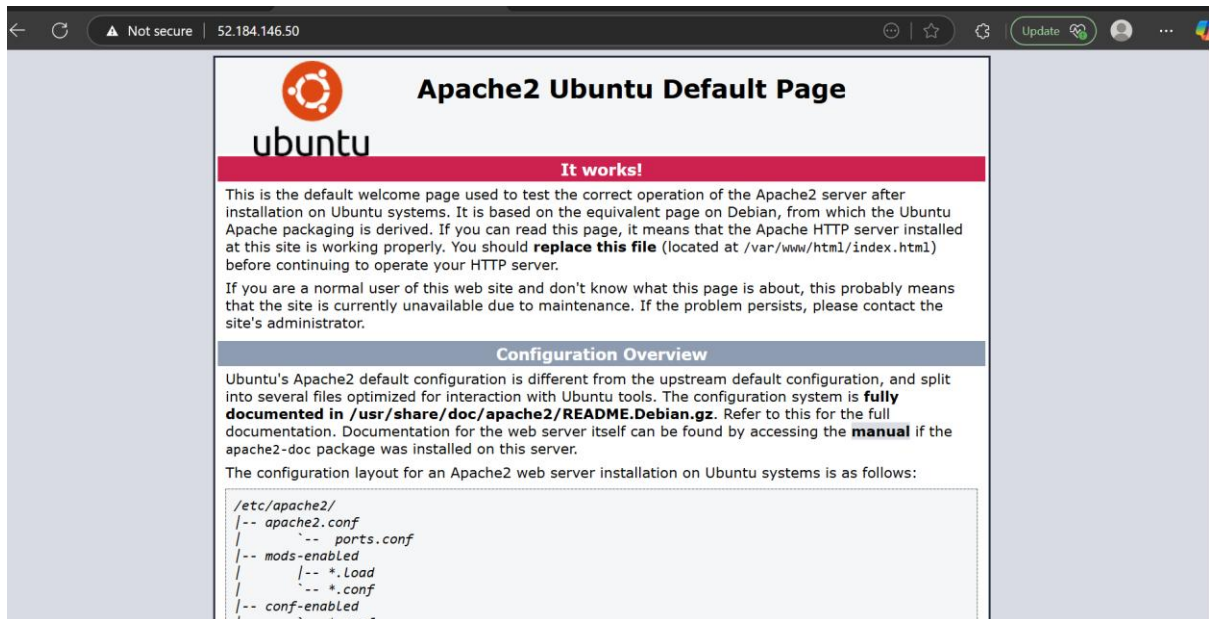
```
sudo mkdir -p /var/www/html
```

```
:~$ sudo chown -R www-data:www-data /var/www/html
```

```
sudo chmod -R 755 /var/www/html
```

```
sudo systemctl restart apache2
```

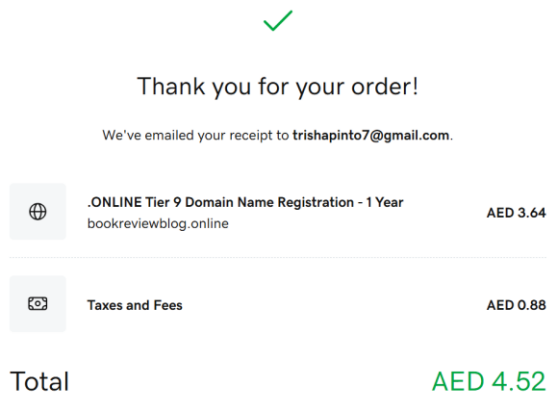
On successful apache setup this should be seen on the IP address' webpage





DOMAIN NAME SERVER SETUP

GoDaddy : DNS provider

Purchase of suitable dns from provider



A screenshot of a GoDaddy order confirmation page. At the top, there is a green checkmark icon. Below it, the text reads "Thank you for your order!" followed by "We've emailed your receipt to trishapinto7@gmail.com." The order details are presented in a table-like format. The first row shows a globe icon, ".ONLINE Tier 9 Domain Name Registration - 1 Year", the subdomain "bookreviewblog.online", and the price "AED 3.64". The second row shows a receipt icon, "Taxes and Fees", and the price "AED 0.88". At the bottom, the word "Total" is followed by the price "AED 4.52" in green.

	.ONLINE Tier 9 Domain Name Registration - 1 Year bookreviewblog.online	AED 3.64
	Taxes and Fees	AED 0.88
Total		AED 4.52

1/log in, click your user icon>> My Products

2.Under Domains, click Manage next to your domain name

3. Access DNS Management

4.On the Domain Settings page, scroll to Additional Settings

5.Click on Manage DNS

6.Add a new record with the following values

New Records

A records use an IP address to connect your domain to a website. They're also used to create subdomains such as www or store, that point to an IP address.

Type *	Name *	Value *	TTL
A	@	52.184.146.50	1 Hour

[+ Add another value](#)

Type: A

Name: @

Value: <http://52.184.146.50/> (IP address of server)

TTL: 1 hour

TLS configuration

sudo apt update

sudo apt install certbot python3-certbot-apache -y

sudo certbot --apache -d bookreviewblog.online -d www.bookreviewblog.online

```
omegaswag7@outlook.com@BookReviewBlog:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-03-28 22:05:53 UTC; 11min ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 5035 (apache2)
      Tasks: 55 (limit: 1062)
     Memory: 11.6M
    CGroup: /system.slice/apache2.service
            └─5035 /usr/sbin/apache2 -k start
              └─5037 /usr/sbin/apache2 -k start
                └─5038 /usr/sbin/apache2 -k start

Mar 28 22:05:53 BookReviewBlog systemd[1]: Starting The Apache HTTP Server...
Mar 28 22:05:53 BookReviewBlog systemd[1]: Started The Apache HTTP Server.
```

Directorypath redirecting

sudo nano /etc/apache2/sites-available/000-default.conf

sudo systemctl restart apache2

```
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname >
    # the server uses to identify itself. This is used when creat>
    # redirection URLs. In the context of virtual hosts, the Serv>
    # specifies what hostname must appear in the request's Host: >
    # match this virtual host. For the default virtual host (this>
    # value is not decisive as it is used as a last resort host r>
    # However, you must set it for any further virtual host expli>
    #ServerName www.example.com

    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/html
    ServerName bookreviewblog.online
    ServerAlias www.bookreviewblog.online

    <Directory /var/www/html>
        Options FollowSymLinks
        AllowOverride All
        Require all granted
    </Directory>
    # Available loglevels: trace8, ..., trace1, debug, info, noti>
    # error, crit, alert, emerg.
```

Enter script into config

```
<VirtualHost *:80>
```

ServerAdmin webmaster@localhost

DocumentRoot /var/www/html

ServerName bookreviewblog.online

ServerAlias www.bookreviewblog.online

<Directory /var/www/html>

Options FollowSymLinks

AllowOverride All

Require all granted

</Directory>

ErrorLog \${APACHE_LOG_DIR}/error.log

CustomLog \${APACHE_LOG_DIR}/access.log combined

</VirtualHost>

>> sudo systemctl restart apache2

WordPress

Setup

```
cd /tmp
```

```
wget https://wordpress.org/latest.tar.gz
```

```
tar -xvzf latest.tar.gz
```

```
sudo mv wordpress /var/www/html/
```

```
omegaswag7@outlook.com@BookReviewBlog:/tmp$ ls /var/www/html/  
index.html  index.html.save  wordpress  
omegaswag7@outlook.com@BookReviewBlog:/tmp$ ls /var/www/html/wordpress  
index.php          wp-config-sample.php  wp-mail.php  
license.txt        wp-content            wp-settings.php  
readme.html       wp-cron.php           wp-signup.php  
wp-activate.php    wp-includes           wp-trackback.php  
wp-admin           wp-links-opml.php     xmlrpc.php  
wp-blog-header.php wp-load.php  
wp-comments-post.php wp-login.php
```

Confirm its downloaded

```
ls /var/www/html/
```

```
ls /var/www/html/wordpress
```

This unpacks and moves the wordpress folder to the Apache web root.

Setting File Ownership and Permissions

To allow the web server to manage WordPress files and avoid permission issues, ownership and permissions were configured using:

```
sudo chown -R www-data:www-data /var/www/html/wordpress
```

```
sudo chmod -R 755 /var/www/html/wordpress
```

This gives Apache (which runs as the www-data user) proper control over the files.

Creating the Database and User in MySQL

A dedicated database and user were created to isolate WordPress's data layer:

```
sudo mysql -u root -p
```

```

omegaswag7@outlook.com@BookReviewBlog:/$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 5261
Server version: 8.0.41-0ubuntu0.20.04.1 (Ubuntu)

Copyright (c) 2000, 2025, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

mysql>

```

Inside the MySQL shell:

```
CREATE DATABASE wordpress;
```

```
CREATE USER 'wordpress'@'localhost' IDENTIFIED BY 'trisha';
```

```
GRANT ALL PRIVILEGES ON wordpress.* TO 'wordpress'@'localhost';
```

```
FLUSH PRIVILEGES;
```

```
EXIT;
```

Have wordpress be directed towards the secured site [www.bookreviewblog.online](https://bookreviewblog.online) and not the insecure address directly.

```

mysql> USE wordpress;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> UPDATE wp_options SET option_value = 'https://bookreviewblog.on
line' WHERE option_name = 'siteurl' OR option_name = 'home';
Query OK, 2 rows affected (0.01 sec)
Rows matched: 2  Changed: 2  Warnings: 0

mysql> EXIT;

```

```
mysql> USE wordpress;
```

```
mysql> UPDATE wp_options SET option_value = 'https://bookreviewblog.online' WHERE
option_name = 'siteurl' OR option_name = 'home';
```

```
mysql> EXIT;
```

This ensures secure and organized access control for WordPress at the database level.

WordPress Configuration File

The default sample configuration file was renamed and edited with the database details:

```
cd /var/www/html/wordpress
```

```
sudo cp wp-config-sample.php wp-config.php
```

```
sudo nano wp-config.php
```

Modified lines:

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

/** Database username */
define( 'DB_USER', 'wordpress' );

/** Database password */
define( 'DB_PASSWORD', 'trisha' );

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

/** Database charset to use in creating database tables. */
define( 'DB_CHARSET', 'utf8' );

/** The database collate type. Don't change this if in doubt. */
define( 'DB_COLLATE', '' );
```

```
define('DB_NAME', 'wordpress');
```

```
define('DB_USER', 'wordpress');
```

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

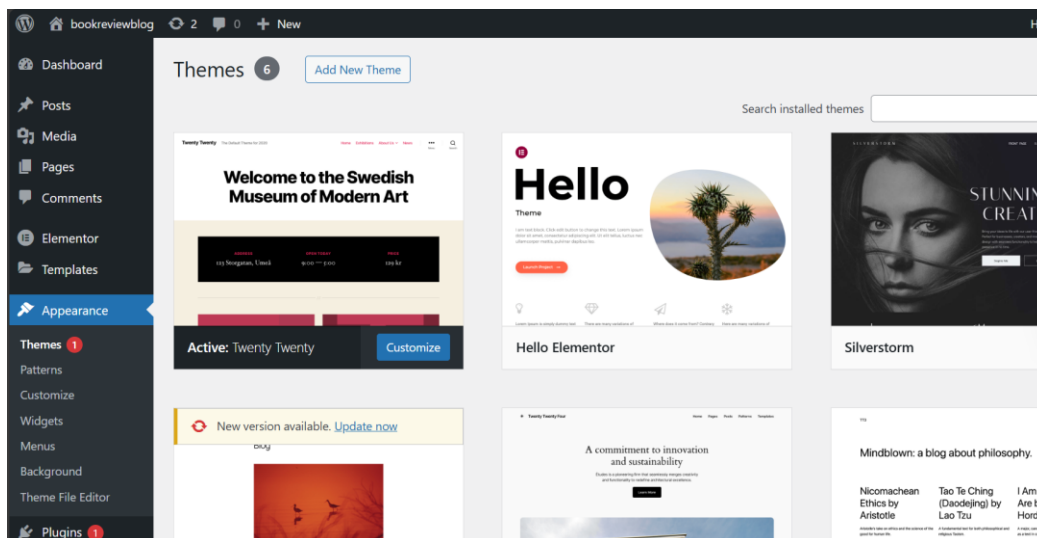
```
define('DB_HOST', 'localhost');
```

Accessing wordpress

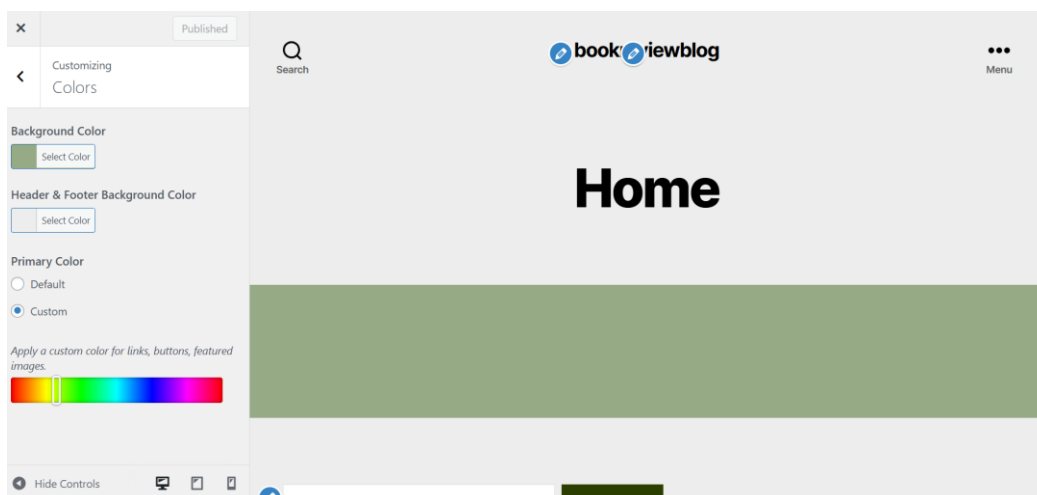
Type in /wordpress after your IP address or website name to access the admin interface

52.184.146.50/wordpress/

- 1.Set username and password
2. Dashboard>> appearance>> themes >> select a theme by clicking install >> activate



Modify color



Add post

bookreviewblog

20

New

View Posts

Howdy, roseline

Dashboard

Posts

Media

Pages

Comments

Appearance

Plugins

Users

Tools

Settings

Collapse menu

Posts

Add New Post

All (3) | Published (3)

Bulk actions

Apply

All dates

All Categories

Filter

Search Posts

3 items

<input type="checkbox"/>	Title	Author	Categories	Tags		Date
<input type="checkbox"/>	The egg	roseline	Philosophy	—		Published 2025/04/07 at 10:57 pm
<input type="checkbox"/>	On Earth we're briefly Gorgeous	roseline	Fiction	—		Published 2025/01/08 at 10:41 pm
<input type="checkbox"/>	Tender Is The Flesh	roseline	Dystopia, Fiction	—		Published 2024/10/08 at 11:24 pm
<input type="checkbox"/>	Title	Author	Categories	Tags		Date

Bulk actions

Apply

3 items

Thank you for creating with WordPress

Version 6.7.2

Add pages

bookreviewblog

20

New

Howdy, roseline

Dashboard

Posts

Media

Pages

Comments

Appearance

Plugins

Users

Tools

Settings

Collapse menu

Pages

Add New Page

All (3) | Published (3) | Trash (3)

Bulk actions

Apply

All dates

Filter

Search Pages

3 items

<input type="checkbox"/>	Title	Author		Date
<input type="checkbox"/>	About	roseline	—	Published 2025/04/08 at 10:10 pm
<input type="checkbox"/>	Home — Front Page	roseline	—	Published 2025/04/08 at 10:10 pm
<input type="checkbox"/>	Reviews — Posts Page	roseline	—	Published 2025/04/08 at 8:42 pm
<input type="checkbox"/>	Title	Author		Date

Bulk actions

Apply

3 items

Thank you for creating with WordPress

Version 6.7.2

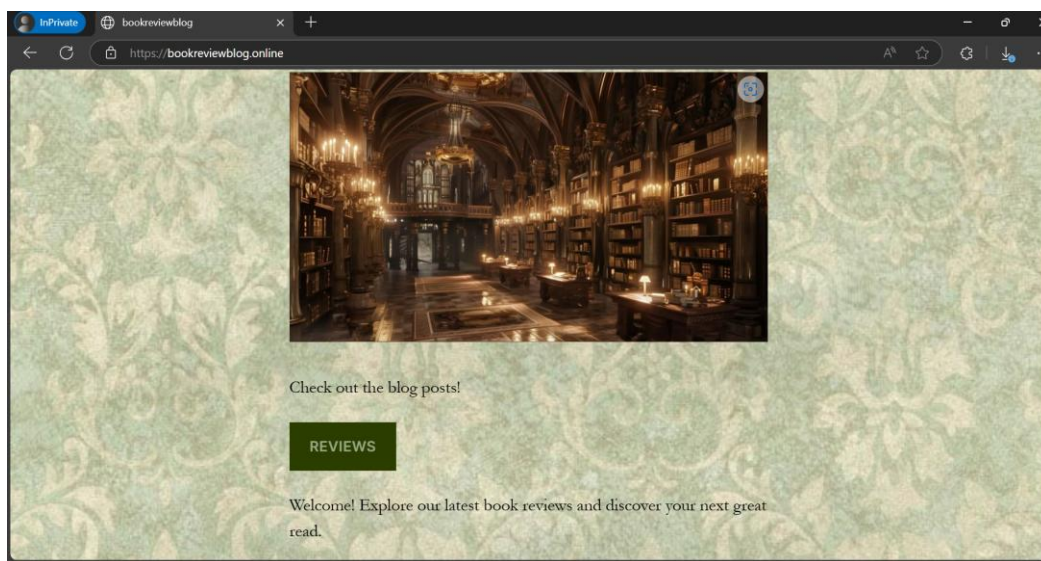
SCRIPTING

Website scripting functionality

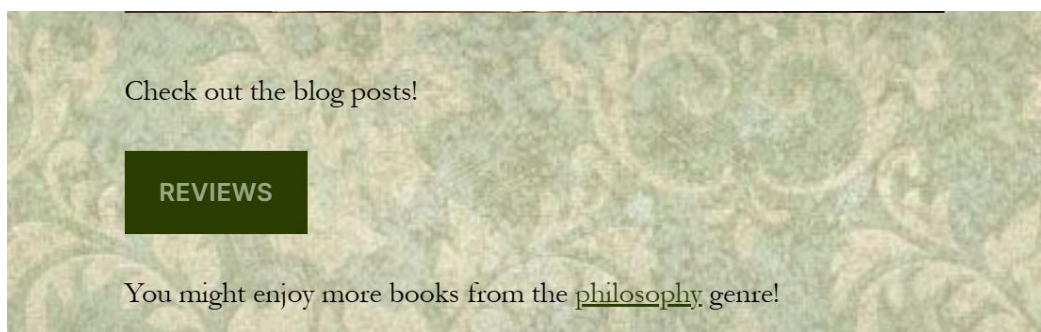
Genre recommendation

This script tracks the genre of book reviews that a user reads on the website. When the user returns to the homepage, the website displays a personalized recommendation based on the last genre they viewed. This improves user engagement and enhances functionality without needing login or database support.

The homepage will display a Welcome statement before user interacts with posts

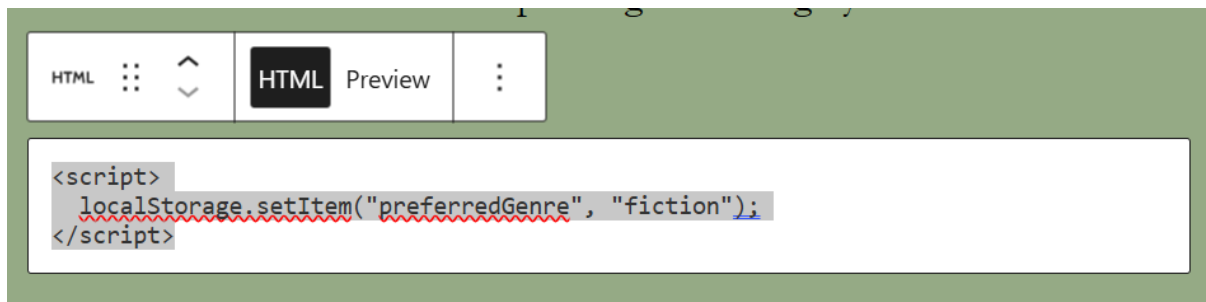


After interaction with the philosophy book 'The egg' by Andy Weir the homepage will now display



This is achieved by:

Set genre for each post

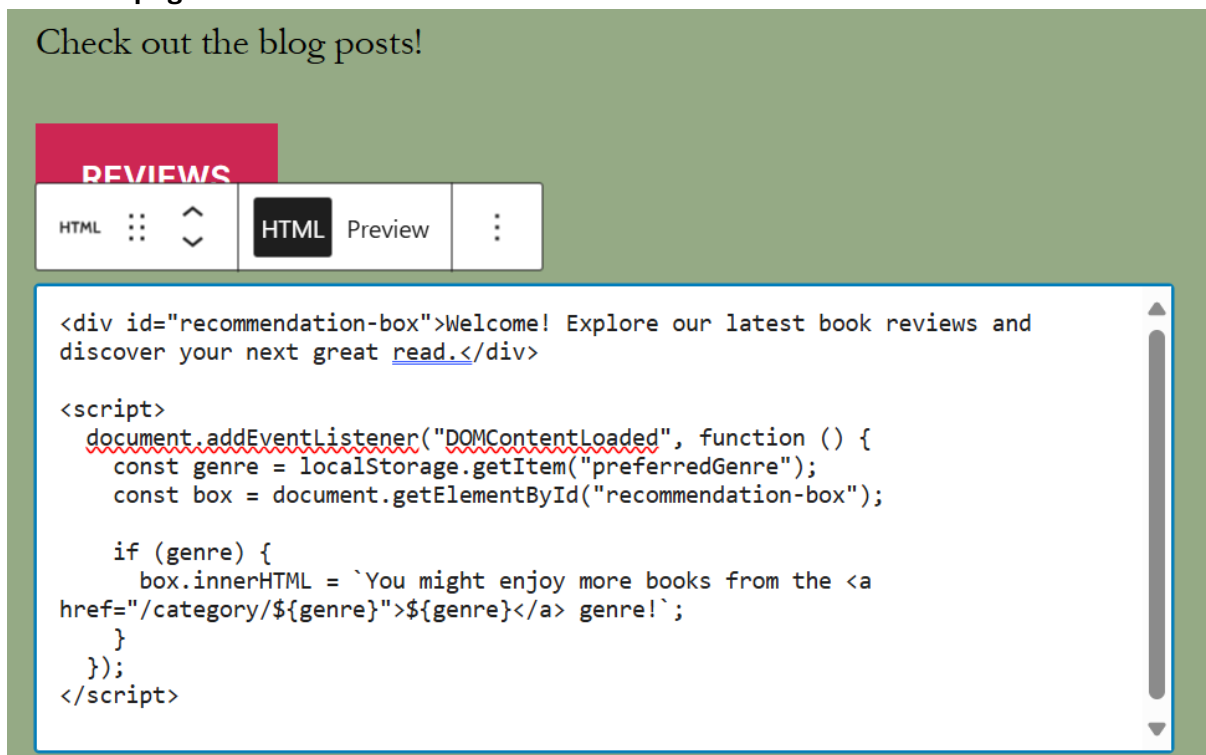


```
<script>

  localStorage.setItem("preferredGenre", "fiction");

</script>
```

Set homepage html



```
<div id="recommendation-box">Welcome! Explore our latest book reviews and
your next great read.</div>
```

```
<script>

document.addEventListener("DOMContentLoaded", function () {

  const genre = localStorage.getItem("preferredGenre");

  const box = document.getElementById("recommendation-box");
```

```

if (genre) {
    box.innerHTML = `You might enjoy more books from the <a
href="/category/${genre}">${genre}</a> genre!`;
}
});
</script>

```

(GeeksforGeeks,2022).

Scripting file traffic counter

This Bash script tracks the number of unique visitors to the WordPress-based book review blog by analyzing the Apache web server access logs. It processes these logs to identify unique IP addresses and then outputs the total visitor count to an HTML file (visitors.html), which is embedded directly into the WordPress site.

This script is automated using a cron job to update the count every hour, ensuring that statistics remain current. It demonstrates integration of server-side scripting, log file analysis, and front-end visibility using iframe.

Create file

```
nano ~/visitor_script.sh
```

enter script

Script

```
# Apache access log path
```

```
access_log="/var/log/apache2/access.log"
```

```
# Extract all IP addresses, remove duplicates
```

```
unique_ips=$(awk '{print $1}' "$access_log" | sort -u)
```

```
# Count them
```

```
num_visitors=$(echo "$unique_ips" | wc -l)
```

```
# Output
```

```
echo "Number of visitors: $(awk '{print $1}' /var/log/apache2/access.log | sort -u | wc -l)" >
/var/www/html/visitors.html
```

Make it executable

```
chmod +x ~/visitor_script.sh
```

Visit output in browser to test

<https://bookreviewblog.online/visitors.html>

Automate with Cron

To update the visitor count every hour:

```
crontab -e
```

Add to script:

```
0 * * * * /bin/bash /home/youruser/visitor_script.sh
GNU nano 4.8 /tmp/crontab.iUtga
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h dom mon dow  command
0 * * * * bash /home/youruser/visitor_script.sh
```

Embed into WordPress

```
<iframe src="https://bookreviewblog.online/visitors.html" width="100%" height="50"
style="border:none;"></iframe>
```

Reference

The Apache Software Foundation. (n.d.). Apache Module mod_log_config.
https://httpd.apache.org/docs/2.4/mod/mod_log_config.html

Mozilla Developer Network (MDN). (n.d.). Window.localStorage – Web APIs. Retrieved from
<https://developer.mozilla.org/en-US/docs/Web/API/Window/localStorage>

GeeksforGeeks. (2022). PHP Recommendation System Using Content-Based Filtering.
<https://www.geeksforgeeks.org/php-recommendation-system-using-content-based-filtering>