8. Create virtualhost for os.iti.gov.eg website

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo nano /etc/apache2/sites-avail
able/os.iti.gov.eg.conf
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo mkdir -p /var/www/os.iti.gov.
eg
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo chown -R www-data:www-data /v
ar/www/os.iti.gov.eg
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo bash -c 'echo "<h1>os.iti.gov
.eg Virtual Host Works!</h1>" > /var/www/os.iti.gov.eg/index.html'
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo a2ensite os.iti.gov.eg.conf
Site os.iti.gov.eg already enabled
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo nano /etc/hosts
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ curl -H "Host: os.iti.gov.eg" http
://localhost/
<h1>os.iti.gov.eg Virtual Host Works!</h1>
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$
```

```
  GNU nano 6.2        /etc/apache2/sites-available/os.iti.gov.eg.conf
<VirtualHost *:80>
    ServerName os.iti.gov.eg
    ServerAdmin webmaster@os.iti.gov.eg
    DocumentRoot /var/www/os.iti.gov.eg

    ErrorLog ${APACHE_LOG_DIR}/os.iti.gov.eg_error.log
    CustomLog ${APACHE_LOG_DIR}/os.iti.gov.eg_access.log combined

    <Directory "/var/www/os.iti.gov.eg">
        Options -Indexes +FollowSymLinks
        AllowOverride All
        Require all granted
    </Directory>
</VirtualHost>
```

```
  GNU nano 6.2                          /etc/hosts *
127.0.0.1        localhost
127.0.1.1        ayooya-HP-Pavilion-Laptop-14-ce3xxx
127.0.0.1   os.iti.gov.eg

# The following lines are desirable for IPv6 capable
::1      ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

os.iti.gov.eg Virtual Host Works!

9. Enable rewrite module

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
  systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$
```

10.What is the importance of rewrite module?
URL Beautification

- Transforms `example.com/profile.php?id=23` → `example.com/profile/23`

Redirect Management

- Permanent (301) and temporary (302) redirects
- Domain migrations (old.com → new.com)

Security Enhancements

- Prevent hotlinking of images
- Block malicious request patterns
- Hide sensitive file extensions (.php → .html)

Conditional URL Manipulation

1. Configure apache to use Worker MPM

```
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo a2dismod mpm_event
Module mpm_event disabled.
To activate the new configuration, you need to run:
  systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$   systemctl restart apache2
Job for apache2.service failed because the control process exited with error code.
See "systemctl status apache2.service" and "journalctl -xeu apache2.service" for details.
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo a2enmod mpm_worker
Considering conflict mpm_event for mpm_worker:
Considering conflict mpm_prefork for mpm_worker:
Enabling module mpm_worker.
To activate the new configuration, you need to run:
  systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$   systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ 
```

2. Check the status of rewrite_mod and enable it if it is enabled.

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo apache2ctl -M | grep rewrite
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
  systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ 
```

3. Write RewriteCond and RewiteRules for:

a. Deny access to http://localhost/page?queryString if queryString contains the string forbidden.

```
  GNU nano 6.2                                                    .htaccess *
RewriteEngine On

# Deny access if query string contains "forbidden"
RewriteCond %{QUERY_STRING} forbidden [NC]
RewriteRule ^ - [F]
```

```
RewriteCond: command not found
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo nano /etc/apache2/sites-available/000-default.conf
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ sudo systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:~$ cd /var/www/html
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ sudo nano .htaccess
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ sudo systemctl restart apache2
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ 
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/page?queryString=forbidden"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /page?queryString=forbidden HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 403 Forbidden
< Date: Sun, 27 Apr 2025 12:23:15 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Content-Length: 274
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>403 Forbidden</title>
</head><body>
<h1>Forbidden</h1>
<p>You don't have permission to access this resource.</p>
<hr>
```

http://localhost/page?queryString=forbidden

Forbidden

You don't have permission to access this resource.

Apache/2.4.52 (Ubuntu) Server at localhost Port 80
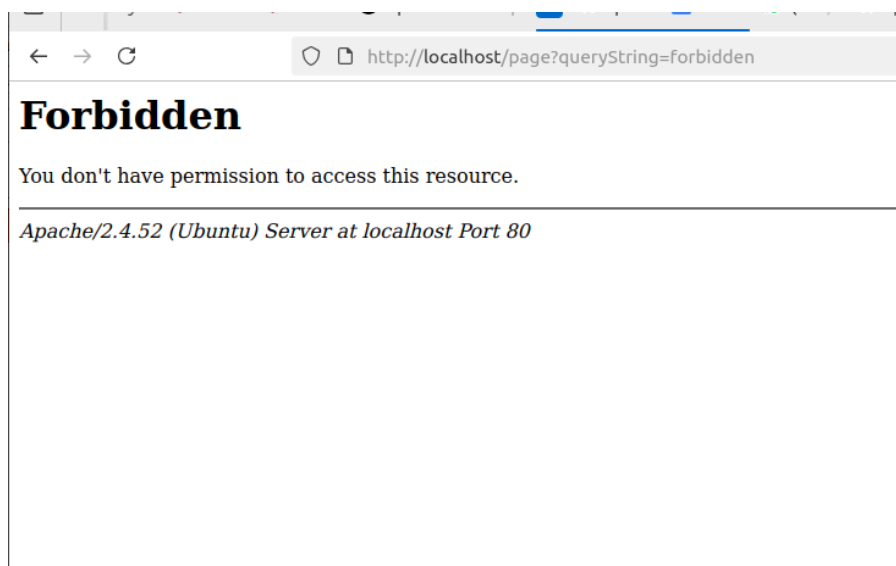
b. Remove the Query String

```
#Remove Query String Entirely
RewriteCond %{QUERY_STRING} .+
RewriteRule ^(.*)$ /$1? [R=301,L]
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/page?var=value"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /page?var=value HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 301 Moved Permanently
< Date: Sun, 27 Apr 2025 12:37:14 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Location: http://localhost/page
< Content-Length: 304
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>301 Moved Permanently</title>
</head><body>
<h1>Moved Permanently</h1>
```

c. Rewrite URLs like http://localhost/page1?var=val to

http://localhost/page2?var=val but do not rewrite if val isn't present.

```
#Conditional Rewrite (Only if val exists)
RewriteCond %{QUERY_STRING} ^var=([^&]+) [NC]
RewriteRule ^page1$ /page2?var=%1 [L]
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/page1?var=test"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /page1?var=test HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 301 Moved Permanently
< Date: Sun, 27 Apr 2025 12:56:20 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Location: http://localhost/page1
< Content-Length: 305
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>301 Moved Permanently</title>
</head><body>
<h1>Moved Permanently</h1>
```

```
</body></html>
* Connection #0 to host localhost left intact
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/page1"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /page1 HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 404 Not Found
< Date: Sun, 27 Apr 2025 13:02:35 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Content-Length: 271
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
<h1>Not Found</h1>
```

d. Take a URL of the form http://localhost/path?var=val and transform it into
http://localhost/path/var/val.

```
#Transform Query to Path
RewriteCond %{QUERY_STRING} ^([^=]+)=([^&]+) [NC]
RewriteRule ^path$ /path/%1/%2? [R=301,L]
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ sudo nano .htaccess
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/path?name=value"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /path?name=value HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 301 Moved Permanently
< Date: Sun, 27 Apr 2025 13:05:07 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Location: http://localhost/path
< Content-Length: 304
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
```

e. Map http://localhost/example/one/two to

http://localhost/something.cgi?arg=one&other=two

```
#Path to CGI Arguments
RewriteRule ^example/([^/]+)/([^/]+)$ /something.cgi?arg=$1&other=$2 [L]
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ curl -v "http://localh
ost/example/foo/bar"
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET /example/foo/bar HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 301 Moved Permanently
< Date: Sun, 27 Apr 2025 13:07:42 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Location: http://localhost/something.cgi
< Content-Length: 313
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>301 Moved Permanently</title>
</head><body>
```

f. (Bonus) Display a goodevening.html page if the time is after 6:00 PM and goodmooring.html page if the time is before that

```
#Time-Based Rewrite (Bonus)
RewriteCond %{TIME_HOUR}%{TIME_MIN} >1800
RewriteRule ^$ /goodevening.html [L]

RewriteCond %{TIME_HOUR}%{TIME_MIN} <1800
RewriteRule ^$ /goodmorning.html [L]
```

```
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET / HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 404 Not Found
< Date: Sun, 27 Apr 2025 16:00:00 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Content-Length: 271
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
<h1>Not Found</h1>
<p>The requested URL was not found on this server.</p>
<hr>
<address>Apache/2.4.52 (Ubuntu) Server at localhost Port 80</address>
```

```
ayooya@ayooya-HP-Pavilion-Laptop-14-ce3xxx:/var/www/html$ sudo date -s "12:00" &
& curl -v http://localhost/
27 2025 ,برأ EEST 12:00:00 م
*   Trying 127.0.0.1:80...
* Connected to localhost (127.0.0.1) port 80 (#0)
> GET / HTTP/1.1
> Host: localhost
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 404 Not Found
< Date: Sun, 27 Apr 2025 09:00:00 GMT
< Server: Apache/2.4.52 (Ubuntu)
< Content-Length: 271
< Content-Type: text/html; charset=iso-8859-1
<
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>404 Not Found</title>
</head><body>
```

4. Create a virtual host for os.iti.gov.eg to redirect to a local directory in your server

```
  GNU nano 6.2        /etc/apache2/sites-available/os.iti.gov.eg.conf
<VirtualHost *:80>
    ServerName os.iti.gov.eg
    ServerAdmin webmaster@os.iti.gov.eg
     # Alternative domains/subdomains
    ServerAlias www.os.iti.gov.eg iti.os.gov.eg
    DocumentRoot /var/www/os.iti.gov.eg
     RedirectMatch 301 ^/$ /welcome/

    ErrorLog ${APACHE_LOG_DIR}/os.iti.gov.eg_error.log
    CustomLog ${APACHE_LOG_DIR}/os.iti.gov.eg_access.log combined

    <Directory "/var/www/os.iti.gov.eg">
        Options -Indexes +FollowSymLinks
        AllowOverride All
        Require all granted
    </Directory>
</VirtualHost>

                              [ Read 17 lines ]
```