PROJECT:- DEVELOP A CODE TO CONVERT VIRTUAL ADDRESS TO PHYSICAL ADDRESS

```
#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <string.h>

#include <sys/man.h>

#include <sys/types.h>

#include <sys/stat.h>

#include <fcntl.h>

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

// Get the virtual address from the user

printf("Enter a virtual address: ");

char input[128];

fgets(input, 128, stdin);


// Parse the virtual address from the input string

void *virtual_address = (void *)strtoul(input, NULL, 16);


// Open the /proc/self/pagemap file

int pagemap_fd = open("/proc/self/pagemap", O_RDONLY);

if (pagemap_fd < 0)
```

```
{
perror("Error opening /proc/self/pagemap");
return 1;
}

// Seek to the correct entry in the pagemap file
off_t pagemap_offset = (unsigned long)virtual_address / getpagesize() * 8;
if (lseek(pagemap_fd, pagemap_offset, SEEK_SET) != pagemap_offset) {
perror("Error seeking in /proc/self/pagemap");
return 1;
}

// Read the entry from the pagemap file
unsigned long pagemap_entry;
if (read(pagemap_fd, &pagemap_entry, 8) != 8) {
perror("Error reading from /proc/self/pagemap");
return 1;
}
```

```
// Extract the physical page number from the pagemap entry

unsigned long physical_page_number = pagemap_entry & ((1ull << 55) - 1);

// Compute the physical address by adding the offset within the page
void *physical_address = (void *)(physical_page_number * getpagesize() +
(unsigned long)virtual_address % getpagesize());

printf("Virtual address: %p\n", virtual_address);
printf("Physical address: %p\n", physical_address);

return 0;
}

/*This program prompts the user to enter a virtual address and then uses the /proc/self/pagemap file to look up the corresponding physical address. The /proc/self/pagemap file is a special file that is provided by the Linux kernel and contains the entries in the current process's page table.
```

Keep in mind that this is just one way to convert a virtual address to a physical address, and the exact method for doing so will depend on the specific operating system and hardware being used.

*/

OUTPUT:-

```
arjumand@arjumand-virtualbox:~$ gedit code.c
arjumand@arjumand-virtualbox:~$ chmod u+x code.c
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: 215371
Virtual address: 0x215371
Physical address: 0x371
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: 123456
Virtual address: 0x123456
Physical address: 0x456
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: a1b5cd4f
Virtual address: 0xa1b5cd4f
Physical address: 0xd4f
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: 483
Virtual address: 0x483
Physical address: 0x483
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: 25
Virtual address: 0x25
Physical address: 0x25
arjumand@arjumand-virtualbox:~$ ./code
Enter a virtual address: 1
Virtual address: 0x1
Physical address: 0x1
arjumand@arjumand-virtualbox:~$
```