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Experiment 10

Aim

Assume that a system has a 32-bit virtual address with a 4-KB page size. Write a C program that is passed a virtual address (in decimal) on the command line and have it output the page number and offset for the given address.

Code:

```
#include <stdio.h>
#include <stdlib.h>

#define PAGE_SIZE 4096 // 4KB in bytes

int main(int argc, char *argv[]) {
    if (argc != 2) {
        printf("Usage: %s <virtual_address>\n", argv[0]);
        return 1;
    }

    unsigned int virtual_address = atoi(argv[1]);
    unsigned int page_number = virtual_address / PAGE_SIZE;
    unsigned int offset = virtual_address % PAGE_SIZE;

    printf("The address %u contains:\n", virtual_address);
    printf("page number = %u\n", page_number);
    printf("offset = %u\n", offset);

    return 0;
}
```

Output:

```
manishj@ubuntu:~/Desktop/os10$ gedit exp10.c
^C
manishj@ubuntu:~/Desktop/os10$ gcc exp10.c
manishj@ubuntu:~/Desktop/os10$ ./a.out 19986
The address 19986 contains:
page number = 4
offset = 3602
manishj@ubuntu:~/Desktop/os10$ ./a.out 8192
The address 8192 contains:
page number = 2
offset = 0
manishj@ubuntu:~/Desktop/os10$ ./a.out 65536
The address 65536 contains:
page number = 16
offset = 0
manishj@ubuntu:~/Desktop/os10$ ./a.out 123456789
The address 123456789 contains:
page number = 30140
offset = 3349
manishj@ubuntu:~/Desktop/os10$
```

Conclusion

Hence, by completing this experiment I came to know about a system has a 32-bit virtual address with a 4-KB page size. Write a C program that is passed a virtual address (in decimal) on the command line and have it output the page number and offset for the given address.