Device Drivers

Github Link : https://github.com/prateekagrawaliiit/Device-Drivers

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Lab Exercise 7:

Write a C program which contains ioctl() and execute.

Usage of ioctl()

Apart from the regular files of a system, there are some special purpose files, such as the device files. The device files are the ones that are used to interact with the different device drivers of a system. However, you cannot access these device files with the help of regular system calls. This is where the “IOCTL” function comes into play. This function helps in accessing these files very conveniently. The “IOCTL” function of the C programming language resides inside the “ioctl.h” header file.

Code

```
/*
* @Author: Prateek Agrawal
* @Date:   2022-03-30 09:30:54
* @Last Modified by:   Prateek Agrawal
* @Last Modified time: 2022-03-30 09:35:32
*/

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <unistd.h>
#include <sys/ioctl.h>

#define WR_VALUE _IOW('a','a', int32_t*)
#define RD_VALUE _IOR('a','b', int32_t*)

int main()
{
     int fileDescriptor;
     int32_t val, num;
     printf("\nOpening a driver\n");
     fileDescriptor = open("/dev/random", O_RDWR);
     if (fileDescriptor < 0)
     {
          printf("Error");
          return 0;
     }
     printf("Enter value you want to send\n");
     scanf("%d", &num);
```

```
        printf("Writing\n");
        ioctl(fileDescriptor, WR_VALUE, (int32_t*)&num);
        printf("Reading value\n");
        ioctl(fileDescriptor, RD_VALUE, (int32_t*)&val);
        printf("The value is %d\n", val);
        close(fileDescriptor);
        return 0;
}
```

Code details-

In this code the ioctl() function is used twice- once to read the values and to write the values to a device file. The general flow of the program goes by- first a device file is opened using a random constant from the dev folder. A file descriptor is assigned to the device file and values are sent to the device file using the ioctl function.

Output Screenshot