Lab 4 OS

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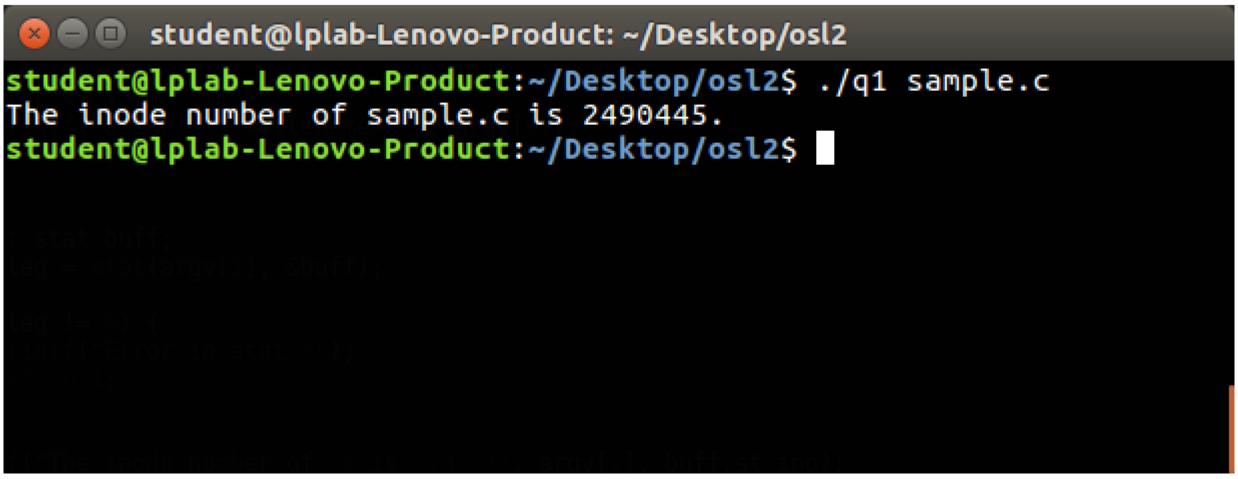
Q1. Write a program to find the inode number of an existing file in a directory. Take the input as a filename and print the inode number of the file.

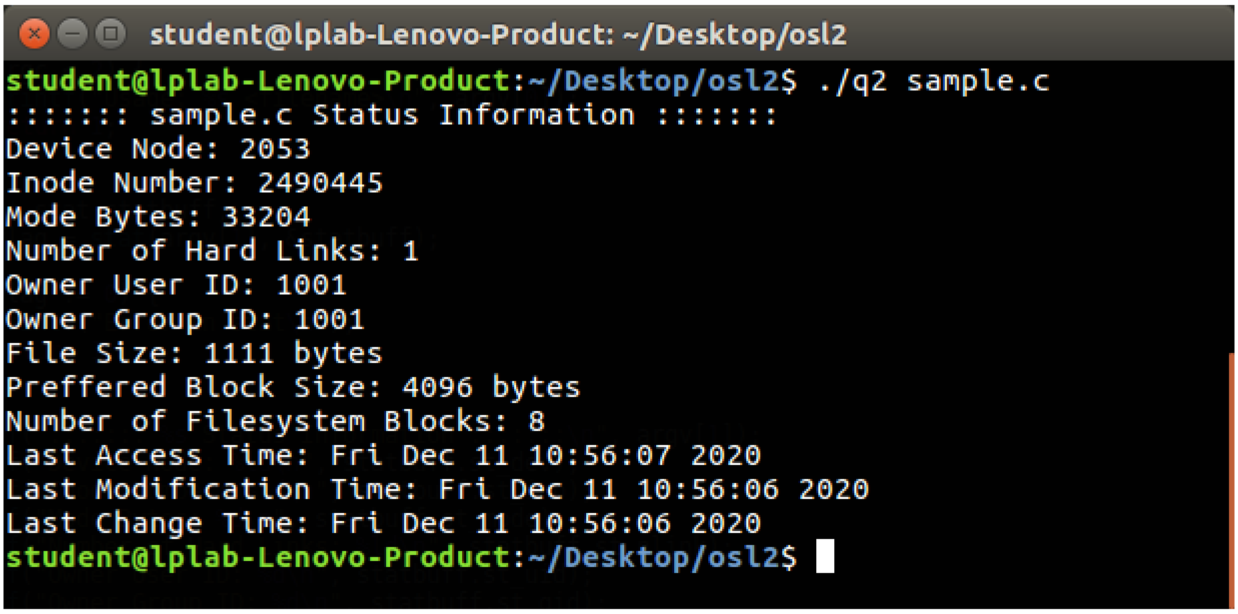
```
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>
#include <sys/stat.h>

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

	if (argc < 2) {
		printf("Usage: %s <filename>\n", argv[0]);
		return 1;
	}

	struct stat buff;
	int flag = stat(argv[1], &buff);

	if (flag != 0) {
		printf("Error in stat\n");
		return 1;
	}

	printf("The inode number of %s is %ld.\n", argv[1], buff.st_ino);
	return 0;
}
```



```
student@lplab-Lenovo-Product:~/Desktop/osl2$ ./q1 sample.c
The inode number of sample.c is 2490445.
student@lplab-Lenovo-Product:~/Desktop/osl2$ 
```

Q2. Write a program to print out the complete stat structure of a file.

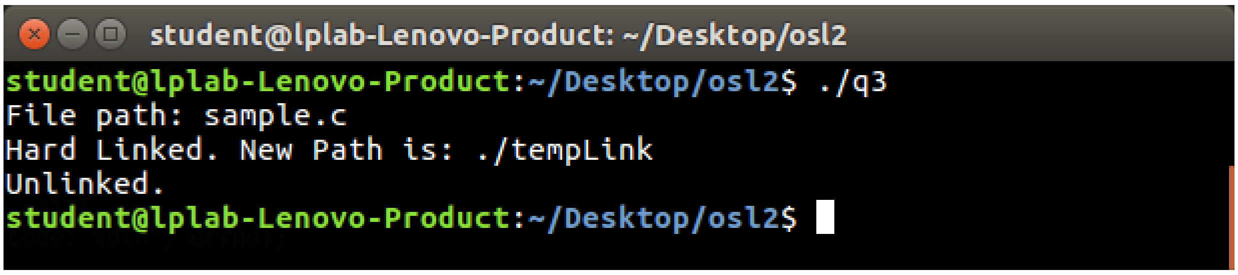
```c
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>
#include <sys/stat.h>
#include <time.h>

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

      if (argc < 2) {
            printf("Usage: %s <filename>\n", argv[0]);
            return 1;
      }

      struct stat statbuff;
      int flag = stat(argv[1], &statbuff);

      if (flag != 0) {
            printf("Error in stat\n");
            return 1;
      }

      printf(":::::: %s Status Information ::::::\n", argv[1]);
      printf("Device Node: %ld\n", statbuff.st_dev);
      printf("Inode Number: %ld\n", statbuff.st_ino);
      printf("Mode Bytes: %d\n", statbuff.st_mode);
      printf("Number of Hard Links: %ld\n", statbuff.st_nlink);
      printf("Owner User ID: %d\n", statbuff.st_uid);
      printf("Owner Group ID: %d\n", statbuff.st_gid);
      printf("File Size: %ld bytes\n", statbuff.st_size);
      printf("Preffered Block Size: %ld bytes\n", statbuff.st_blksize);
      printf("Number of Filesystem Blocks: %ld\n", statbuff.st_blocks);

      // char* ctime(time_t*)
      printf("Last Access Time: %s", ctime(&statbuff.st_atime));
      printf("Last Modification Time: %s", ctime(&statbuff.st_mtime));
      printf("Last Change Time: %s", ctime(&statbuff.st_mtime));

      return 0;
}
```


student@lplab-Lenovo-Product: ~/Desktop/osl2

```
student@lplab-Lenovo-Product:~/Desktop/osl2$ ./q2 sample.c
::::::: sample.c Status Information :::::::
Device Node: 2053
Inode Number: 2490445
Mode Bytes: 33204
Number of Hard Links: 1
Owner User ID: 1001
Owner Group ID: 1001
File Size: 1111 bytes
Preffered Block Size: 4096 bytes
Number of Filesystem Blocks: 8
Last Access Time: Fri Dec 11 10:56:07 2020
Last Modification Time: Fri Dec 11 10:56:06 2020
Last Change Time: Fri Dec 11 10:56:06 2020
student@lplab-Lenovo-Product:~/Desktop/osl2$
```

Q3. Write a program to create a new hard link to an existing file and unlink the same. Accept the old path as input and print the newpath.

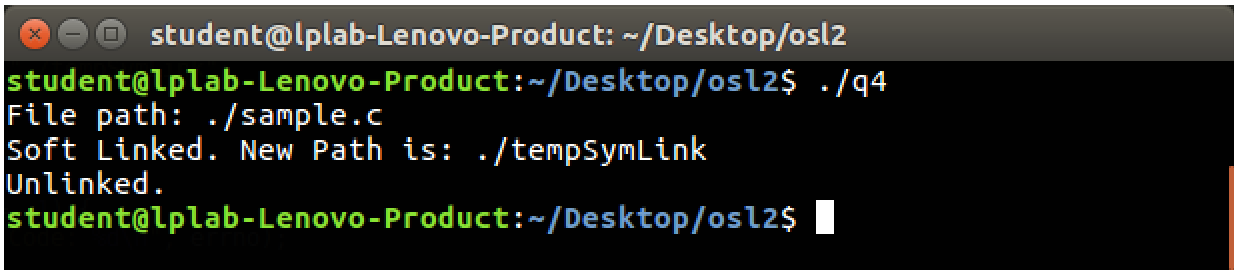
```
#include <unistd.h>
#include <stdio.h>
#include <stdlib.h>
#include <errno.h>

void main() {
	char oldPath[50], newPath[50] = "./tempLink";

	printf("File path: ");
	scanf("%s", oldPath);

	if (link(oldPath, newPath) == -1) {
		printf("Hard Linking error. Code: %d\n", errno);
		exit(1);
	} else {
		printf("Hard Linked. New Path is: %s\n", newPath);
	}

	if (unlink(newPath) == -1) {
		printf("Unlinking error. Code: %d\n", errno);
		exit(1);
	} else {
		printf("Unlinked.\n");
	}
}
```



```
student@lplab-Lenovo-Product:~/Desktop/osl2$ ./q3
File path: sample.c
Hard Linked. New Path is: ./tempLink
Unlinked.
student@lplab-Lenovo-Product:~/Desktop/osl2$ 
```

Q4. Write a program to create a new soft link to an existing file and unlink the same. Accept the old path as input and print the newpath.

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

void main() {
	char oldPath[50], newPath[50] = "./tempSymLink";

	printf("File path: ");
	scanf("%s", oldPath);

	if (symlink(oldPath, newPath) == -1) {
		printf("Soft Linking error. Code: %d\n", errno);
		exit(1);
	} else {
		printf("Soft Linked. New Path is: %s\n", newPath);
	}

	if (unlink(newPath) == -1) {
		printf("Unlinking error. Code: %d\n", errno);
		exit(1);
	} else {
		printf("Unlinked.\n");
	}
}
```



```
student@lplab-Lenovo-Product:~/Desktop/osl2$ ./q4
File path: ./sample.c
Soft Linked. New Path is: ./tempSymLink
Unlinked.
student@lplab-Lenovo-Product:~/Desktop/osl2$
```