

40. Illustrate the various File Access Permission and different types users in Linux.

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

void display_permissions(mode_t mode) {
    printf("File permissions: ");
    // Owner permissions
    printf((mode & S_IRUSR) ? "r" : "-");
    printf((mode & S_IWUSR) ? "w" : "-");
    printf((mode & S_IXUSR) ? "x" : "-");
    // Group permissions
    printf((mode & S_IRGRP) ? "r" : "-");
    printf((mode & S_IWGRP) ? "w" : "-");
    printf((mode & S_IXGRP) ? "x" : "-");
    // Others permissions
    printf((mode & S_IROTH) ? "r" : "-");
    printf((mode & S_IWOTH) ? "w" : "-");
    printf((mode & S_IXOTH) ? "x" : "-");
    printf("\n");
}

int main() {
    struct stat fileStat;
    const char *filename = "demo.txt";
    // Step 1: Create file with rw-r--r-- permissions (0644)
}
```

```
int fd = creat(filename, 0644);
if (fd < 0) {
    perror("Error creating file");
    return 1;
}
close(fd);
printf("File '%s' created successfully.\n", filename);

// Step 2: Display initial permissions
if (stat(filename, &fileStat) < 0) {
    perror("Error getting file status");
    return 1;
}
printf("Initial ");
display_permissions(fileStat.st_mode);

// Step 3: Change file permissions to rwxr-xr--
if (chmod(filename, 0754) < 0) {
    perror("Error changing permissions");
    return 1;
}
printf("File permissions changed to 754 (rwxr-xr--).\n");

// Step 4: Display new permissions
if (stat(filename, &fileStat) < 0) {
    perror("Error getting file status");
    return 1;
}
printf("Updated ");
display_permissions(fileStat.st_mode);
printf("\nExplanation:\n");
printf("Owner: rwx (read, write, execute)\n");
printf("Group: r-x (read, execute)\n");
```

```
printf("Others: r-- (read only)\n");

return 0;
}
```

## **OUTPUT:**

File 'demo.txt' created successfully.  
Initial File permissions: rw-r--r--  
File permissions changed to 754 (rwxr-xr--).  
Updated File permissions: rwxr-xr--

Explanation:

Owner: rwx (read, write, execute)  
Group: r-x (read, execute)  
Others: r-- (read only)