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15. Design a C program to organise the file using a two level directory structure.

AIM:

To design a C program that organizes files using a two-level directory structure.

ALGORITHM:

1. Initialize the directory structure with a maximum number of directories and files.
2. Define functions to create directories and files, delete files, display files in a directory, and search for files within a directory.
3. Implement user interaction through a menu to allow creating directories, adding/removing files, displaying files, and searching for files.

PROCEDURE:

1. Define the Directory structure with an array of files.
2. Define functions for managing directories and files:
    - create_directory() to create a new directory.
    - create_file_in_directory() to add files to an existing directory.
    - delete_file_from_directory() to remove files from a directory.
    - display_files_in_directory() to display the list of files in a directory.
    - search_file_in_directory() to search for a file in a directory.
3. Use a loop to present a menu to the user for interaction.
4. Allow the user to create directories, add files, delete files, display files, and search files.

CODE:

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#include <stdio.h>

#include <string.h>


#define MAX_FILES 10
```

```
#define MAX_DIRS 5
#define MAX_FILE_NAME 50
#define MAX_DIR_NAME 50

typedef struct {
   char file_name[MAX_FILE_NAME];
   int is_present;
} File;

typedef struct {
   char dir_name[MAX_DIR_NAME];
   File files[MAX_FILES];
} Directory;

Directory directories[MAX_DIRS];

void initialize_directory_structure() {
   for (int i = 0; i < MAX_DIRS; i++) {
      directories[i].dir_name[0] = '\0';
      for (int j = 0; j < MAX_FILES; j++) {
         directories[i].files[j].is_present = 0;
      }
   }
}

int create_directory(const char *dir_name) {
   for (int i = 0; i < MAX_DIRS; i++) {
      if (directories[i].dir_name[0] == '\0') {
```

```
            strncpy(directories[i].dir_name, dir_name, MAX_DIR_NAME);
            return 1;
        }
    }
    return 0;
}

int create_file_in_directory(const char *dir_name, const char *file_name) {
    for (int i = 0; i < MAX_DIRS; i++) {
        if (strcmp(directories[i].dir_name, dir_name) == 0) {
            for (int j = 0; j < MAX_FILES; j++) {
                if (directories[i].files[j].is_present == 0) {
                    strncpy(directories[i].files[j].file_name, file_name, MAX_FILE_NAME);
                    directories[i].files[j].is_present = 1;
                    return 1;
                }
            }
        }
    }
    return 0;
}

int delete_file_from_directory(const char *dir_name, const char *file_name) {
    for (int i = 0; i < MAX_DIRS; i++) {
        if (strcmp(directories[i].dir_name, dir_name) == 0) {
            for (int j = 0; j < MAX_FILES; j++) {
                if (directories[i].files[j].is_present == 1 && strcmp(directories[i].files[j].file_name,
file_name) == 0) {
```

```
                directories[i].files[j].is_present = 0;
                return 1;
            }
        }
    }
    return 0;
}

void display_files_in_directory(const char *dir_name) {
    for (int i = 0; i < MAX_DIRS; i++) {
        if (strcmp(directories[i].dir_name, dir_name) == 0) {
            printf("Files in directory '%s':\n", dir_name);
            int found = 0;
            for (int j = 0; j < MAX_FILES; j++) {
                if (directories[i].files[j].is_present == 1) {
                    printf("%s\n", directories[i].files[j].file_name);
                    found = 1;
                }
            }
            if (!found) {
                printf("No files in this directory.\n");
            }
        }
    }
}

int search_file_in_directory(const char *dir_name, const char *file_name) {
```

```
    for (int i = 0; i < MAX_DIRS; i++) {
        if (strcmp(directories[i].dir_name, dir_name) == 0) {
            for (int j = 0; j < MAX_FILES; j++) {
                if (directories[i].files[j].is_present == 1 && strcmp(directories[i].files[j].file_name,
file_name) == 0) {
                    return 1;
                }
            }
        }
    }
    return 0;
}
int main() {
    int choice;
    char dir_name[MAX_DIR_NAME], file_name[MAX_FILE_NAME];
    initialize_directory_structure();
    while (1) {
        printf("\nMenu:\n");
        printf("1. Create a directory\n");
        printf("2. Create a file in a directory\n");
        printf("3. Delete a file from a directory\n");
        printf("4. Display files in a directory\n");
        printf("5. Search for a file in a directory\n");
        printf("6. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        getchar();
        switch (choice) {
```

```
case 1:
    printf("Enter directory name to create: ");
    fgets(dir_name,  MAX_DIR_NAME,  stdin);
    dir_name[strcspn(dir_name,  "\n")]  =  '\0';
    if (create_directory(dir_name)) {
        printf("Directory '%s' created successfully.\n", dir_name);
    } else {
        printf("No space for new directories.\n");
    }
    break;
case 2:
    printf("Enter directory name to create file in: ");
    fgets(dir_name, MAX_DIR_NAME, stdin);
    dir_name[strcspn(dir_name,  "\n")] = '\0';
    printf("Enter file name to create: ");
    fgets(file_name, MAX_FILE_NAME, stdin);
    file_name[strcspn(file_name,  "\n")] = '\0';
    if (create_file_in_directory(dir_name, file_name)) {
        printf("File '%s' created in directory '%s'.\n", file_name, dir_name);
    } else {
        printf("Directory not found or directory is full.\n");
    }
    break;
case 3:
    printf("Enter directory name to delete file from: ");
    fgets(dir_name, MAX_DIR_NAME, stdin);
    dir_name[strcspn(dir_name,  "\n")] = '\0';
    printf("Enter file name to delete: ");
```

```
            fgets(file_name, MAX_FILE_NAME, stdin);
            file_name[strcspn(file_name, "\n")] = '\0';
            if (delete_file_from_directory(dir_name, file_name)) {
                printf("File '%s' deleted from directory '%s'.\n", file_name, dir_name);
            } else {
                printf("File not found in directory '%s'.\n", dir_name);
            }
            break;
        case 4:
            printf("Enter directory name to display files: ");
            fgets(dir_name, MAX_DIR_NAME, stdin);
            dir_name[strcspn(dir_name, "\n")] = '\0';
            display_files_in_directory(dir_name);
            break;
        case 5:
            printf("Enter directory name to search for file: ");
            fgets(dir_name, MAX_DIR_NAME, stdin);
            dir_name[strcspn(dir_name, "\n")] = '\0';
            printf("Enter file name to search: ");
            fgets(file_name, MAX_FILE_NAME, stdin);
            file_name[strcspn(file_name, "\n")] = '\0';
            if (search_file_in_directory(dir_name, file_name)) {
                printf("File '%s' found in directory '%s'.\n", file_name, dir_name);
            } else {
                printf("File '%s' not found in directory '%s'.\n", file_name, dir_name);
            }
            break;
        case 6:
```

```
            printf("Exiting the program.\n");
            return 0;
        default:
            printf("Invalid choice. Please try again.\n");
    }
  }
  return 0;
}
```

OUTPUT: