

Project Report

Program to Select Four Class Representatives Randomly from a List of Students

1. Introduction

This project presents a C program designed to randomly select four class representatives from a total of 60 students. The program reads all student names from an external text file (`students.txt`) and performs a fair and unbiased random selection without repetition.

2. Objective

- Read 60 student names from a file.
- Validate that the file contains the required number of entries.
- Randomly select 4 unique class representatives.
- Display the selected students on the screen.

3. Tools and Technologies Used

- Language: C
- Compiler: GCC
- Header Files: `stdio.h`, `stdlib.h`, `time.h`, `string.h`

4. Program Logic and Flow

4.1 Reading Student Data

The program opens `students.txt` , reads each name using `fgets()` , removes newline characters, and stores them in an array.

4.2 Random Selection

A `used[]` array ensures no student is selected twice. `srand(time(NULL))` provides randomization, and four unique indices are chosen.

4.3 Output

The program prints the four selected class representatives.

5. Code Listing

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

#define TOTAL_STUDENTS 60
#define REPS 4
#define MAX_NAME_LEN 100

int main() {
    FILE *fp = fopen("students.txt", "r");
    if (fp == NULL) {
        printf("Error: Could not open students.txt\n");
        return 1;
    }

    char students[TOTAL_STUDENTS][MAX_NAME_LEN];
    int count = 0;

    while (fgets(students[count], MAX_NAME_LEN, fp) != NULL && count < TC
        students[count][strcspn(students[count], "\n")] = '\0';
        count++;
    }
    fclose(fp);

    if (count < TOTAL_STUDENTS) {
        printf("Error: File does not contain 60 student names.\n");
        return 1;
    }

    int used[TOTAL_STUDENTS] = {0};
    int indices[REPS];
```

```
    srand(time(NULL));

    for (int i = 0; i < REPS; i++) {
        int r;
        do {
            r = rand() % TOTAL_STUDENTS;
        } while (used[r]);
        used[r] = 1;
        indices[i] = r;
    }

    printf("\nSelected Class Representatives:\n");
    for (int i = 0; i < REPS; i++) {
        printf("%s\n", students[indices[i]]);
    }

    return 0;
}
```

6. Sample Output

Selected Class Representatives:

Garvit Sharma

Sahil Pravesh Sharma

Neer Bhayani

Abhyarth Parmar

7. Conclusion

The program successfully demonstrates file handling, string manipulation, and random number generation in C to fairly select class representatives.

8. References

- The C Programming Language (K&R)
- GCC Documentation
- C Standard Library Reference