#include <stdio.h>

#include <stdlib.h>

#include <math.h>

#include <string.h>

#include <time.h>

#include <unistd.h>

typedef struct Player {

    char name[30];

    float luckyRatio;

    int guessedNumber;

} Player;

void unluck();

void tryAgain();

void right();

// Function to generate the random number form 1000-9999

int setRandomNumber()

{

    srand(time(NULL));

    int result = (rand() % 9000) + 1000;

    return result;

}

// Get and check name

void checkInputName(char \*name) {

    int stringLength, spaceCount;

    do {

        stringLength = strlen(name);

        spaceCount = 0;

        // Check the length and spaces in the name

        for (int i = 0; i < stringLength; i++) {

            if (name[i] == ' ') {

                spaceCount++;

            }

        }

        if (stringLength > 30 || spaceCount > 0||stringLength==0) {

            printf("\033[1;31m");

            printf("Invalid Player name. It must be < 30 characters and >=1 character and should not contain spaces.\n");

            printf("\033[0m");

            printf("Enter your name again:");

            gets(name);

        } else {

            break;  // Exit the loop if the name is valid

        }

    } while (1);

}

//Check number

void checkInputNumber(int \*a)

{

    while (\*a>9999||\*a<1000)

    {

        printf("\033[1;31m");

        printf("Invalid number. It must be 1000-9999\n");

        printf("\033[0m");

        printf("Enter your number again:");

        scanf("%d",a);

    }

}

//Check option of player

void checkOption(char \*a)

{

    while((\*a!='y')&&(\*a!='n')&&(\*a!='d')&&(\*a!='D')&&(\*a!='Y')&&(\*a!='N'))

    {

        printf("\033[1;31m");

        printf("Invalid option. Enter your option again\n");

        printf("Press 'y' to continue.\nPress 'n' to exit.\nPress 'd' to see top 5 players\n");

        printf("\033[0m");

        printf("enter your option again:");

        getc(stdin);

        scanf(" %c",a);

    }

}

//Function to compare the rondam number with user's number and print the results in the required format

void printComparisonResult(int a, int b) {

    if(a!=b)

    {

        unluck();

        sleep(0.2);

        tryAgain();

        sleep(1);

    }

    printf("Here is your result: ");

    for (int i = 1000; i > 0; i /= 10) {

        int digitA = (a / i) % 10;

        int digitB = (b / i) % 10;

        if (digitA == digitB) {

            printf("%d", digitA);

        } else {

            printf("-");

        }

    }

}

//Function to load information of player into file

void savePlayerToFile(Player \*player) {

    FILE \*file = fopen("E:/cex/top2LuckyPlayer.txt", "a+");

    if (file == NULL) {

        printf("Error opening file.\n");

        return;

    }

    fprintf(file, "%s %d %.2f%%\n", player->name, player->guessedNumber, player->luckyRatio);

    fclose(file);

}

//Function to read information from file and printf out top 5 players

void findAndPrintTopPlayers() {

    FILE \*file = fopen("E:/cex/top2LuckyPlayer.txt", "r");

    if (file == NULL) {

        printf("Error opening file.\n");

        return;

    }

    Player players[100];

    int numPlayers = 0;

    while (fscanf(file, "%s %d %f%%", players[numPlayers].name, &players[numPlayers].guessedNumber, &players[numPlayers].luckyRatio) == 3)

    {

        numPlayers++;

    }

    fclose(file);

    // Sort players based on lucky ratio in descending order

    for (int i = 0; i < numPlayers - 1; i++) {

        for (int j = i + 1; j < numPlayers; j++) {

            if (players[i].luckyRatio < players[j].luckyRatio) {

                Player temp = players[i];

                players[i] = players[j];

                players[j] = temp;

            }

        }

    }

    // Print top 5 players

    printf("\e[1;33m");

    printf("////////////////////////////////////////////////////////////\n");

    printf("//                    TOP 5 PLAYERS                       //\n");

    printf("////////////////////////////////////////////////////////////\n");

    printf("%-35s %-10s %-15s\n", "Player", "Number", "Lucky Ratio");

    printf("------------------------------------------------------------\n");

    printf("\e[0m");

    for (int i = 0; i < 5 && i < numPlayers; i++)

    {

        printf("%-35s %-10d %.2f%%\n", players[i].name, players[i].guessedNumber, players[i].luckyRatio);

        sleep(1);

    }

}

// Function for starting game

void printWelcomeScreen() {

    char start;

    printf("\e[1;35m");

    printf("#       #     #  #####  #    # #     #      #     # #     # #     # ######  ####### ######  \n");

    printf("#       #     # #     # #   #   #   #       ##    # #     # ##   ## #     # #       #     # \n");

    printf("#       #     # #       #  #     # #        # #   # #     # # # # # #     # #       #     # \n");

    printf("#       #     # #       ###       #         #  #  # #     # #  #  # ######  #####   ######  \n");

    printf("#       #     # #       #  #      #         #   # # #     # #     # #     # #       #   #   \n");

    printf("#       #     # #     # #   #     #         #    ## #     # #     # #     # #       #    #  \n");

    printf("#######  #####   #####  #    #    #         #     #  #####  #     # ######  ####### #     # \n");

    printf("\e[0m");

    sleep(1);

    printf("Let start\n");

}

int main() {

    printWelcomeScreen();

    char userOption;    // variable stand for user's option

    Player newPlayer;

    do {

        int randomNumber = setRandomNumber();

        int incorrectEntriesCount = 0;

        printf("Enter your name: ");

        gets(newPlayer.name);

        checkInputName(newPlayer.name);

        // allow people enter number until have a right number

        do {

            printf("Enter your number:   ");

            scanf("%d",&newPlayer.guessedNumber);

            checkInputNumber(&newPlayer.guessedNumber);

            incorrectEntriesCount++;

            printComparisonResult(randomNumber, newPlayer.guessedNumber);

            printf("\n");

        } while (newPlayer.guessedNumber != randomNumber);

        sleep(1);

        right();

        newPlayer.luckyRatio = 100.00 / incorrectEntriesCount;

        printf("\e[1;31m%s\e[0m guessed the right number \e[1;31m%d\e[0m with a lucky ratio of \e[1;32m%.2f%%\e[0m", newPlayer.name, randomNumber, newPlayer.luckyRatio);

        savePlayerToFile(&newPlayer);

        printf("\nPress 'y' to continue.\nPress 'n' to exit.\nPress 'd' to see top 5 players\nWhat is your option: ");

        scanf(" %c", &userOption);

        checkOption(&userOption);

        if(userOption=='n'||userOption=='N')

        {

            return 0;

        }

        else if(userOption =='d'||userOption=='D')

        {

            findAndPrintTopPlayers();

        }

        else

        {

        }

        getc(stdin);

    } while (userOption == 'y'||userOption=='Y');

    return 0;

}

void unluck ()

{

    printf("\e[1;36m");

    printf("\n\n\n                   \*\*                 \*\*             \n");

    printf("                  /\*\*                /\*\*      \*\*   \*\*\n");

    printf(" \*\*   \*\* \*\*\*\*\*\*\*  /\*\* \*\*   \*\*  \*\*\*\*\* /\*\*  \*\* //\*\* \*\* \n");

    printf("/\*\*  /\*\*//\*\*///\*\* /\*\*/\*\*  /\*\* \*\*///\*\*/\*\* \*\*   //\*\*\*  \n");

    printf("/\*\*  /\*\* /\*\*  /\*\* /\*\*/\*\*  /\*\*/\*\*  // /\*\*\*\*     /\*\*   \n");

    printf("/\*\*  /\*\* /\*\*  /\*\* /\*\*/\*\*  /\*\*/\*\*   \*\*/\*\*/\*\*    \*\*    \n");

    printf("//\*\*\*\*\*\* \*\*\*  /\*\* \*\*\*//\*\*\*\*\*\*//\*\*\*\*\* /\*\*//\*\*  \*\*     \n");

    printf(" ////// ///   // ///  //////  /////  //  //  //      \n\n\n\n\n");

    printf("\e[0m");

}

void tryAgain()

{

    printf("\e[1;36m");

    printf("\a\a\n\n\n \*\*\*\*\*\*\*\*\*\*                                               \*\*            \*\*\n");

    printf("/////\*\*///          \*\*   \*\*              \*\*\*\*\*           //            /\*\*\n");

    printf("    /\*\*     \*\*\*\*\*\* //\*\* \*\*     \*\*\*\*\*\*   \*\*///\*\*  \*\*\*\*\*\*   \*\* \*\*\*\*\*\*\*   /\*\*\n");

    printf("    /\*\*    //\*\*//\*  //\*\*\*     //////\*\* /\*\*  /\*\* //////\*\* /\*\*//\*\*///\*\*  /\*\*\n");

    printf("    /\*\*     /\*\* /    /\*\*       \*\*\*\*\*\*\* //\*\*\*\*\*\*  \*\*\*\*\*\*\* /\*\* /\*\*  /\*\*  /\*\*\n");

    printf("    /\*\*     /\*\*      \*\*       \*\*////\*\*  /////\*\* \*\*////\*\* /\*\* /\*\*  /\*\*  // \n");

    printf("    /\*\*    /\*\*\*     \*\*       //\*\*\*\*\*\*\*\*  \*\*\*\*\* //\*\*\*\*\*\*\*\*/\*\* \*\*\*  /\*\*   \*\*\n");

    printf("    //     ///     //         ////////  /////   //////// // ///   //   // \n\n\n\n\n");

    printf("\e[0m");

}

void right()

{   printf("\n\n\n\n");

    printf("\e[1;33m");

    printf("########  ####  ######   ##     ## ######## \n");

    printf("##     ##  ##  ##    ##  ##     ##    ##    \n");

    printf("##     ##  ##  ##        ##     ##    ##    \n");

    printf("########   ##  ##   #### #########    ##    \n");

    sleep(1);

    printf("##   ##    ##  ##    ##  ##     ##    ##    \n");

    printf("##    ##   ##  ##    ##  ##     ##    ##    \n");

    printf("##     ## ####  ######   ##     ##    ##    \n");

    printf("\e[0m");

    printf("\n\n\n\n");

}