CODE REPORT OF HOMEWORK8

File Reading and Data Storage:

findCount: This function determines the number of rows (individuals) in the "input1.txt" file.

fix_bugs: This function replaces carriage returns ('\r') with null characters ('\0') to avoid issues when reading data.

readTxt1: Reads data from "input1.txt", storing names, surnames, ages, and academic branches in the listOfPeople array and ages in the ages array.

printAllPeople: Prints a formatted table displaying all individuals with their information.

Data Processing Functions:

isSameBranch: Checks if a given branch name exists within a string containing multiple branch names.

print_special_branch: Prints information of individuals who have the specified branch (e.g., "SCIENCE").

show_computer_scientist: Prints information of individuals who are mathematicians but not computer scientists.

switchArray: Swaps the contents of two character arrays.

sort_people_by_age: Sorts the listOfPeople and ages arrays based on age in ascending order.

sort_people_by_branch: Sorts the arrays first by branch (alphabetically) and then by age for individuals with the same branches.

User Interface:

print_menu: Displays a menu of options for the user to interact with the data.

The main function handles user input and calls the appropriate functions based on user selection. Options include sorting and displaying individuals by age or branch, showing individuals with specific branches, and exiting the program.

Part 2: Pattern Searching

File Reading and Data Storage:

fix_bugs2: Similar to fix_bugs but also replaces newline characters ('\n') with null characters.

readTxt2: Reads the "input2.txt" file and stores the characters in the strs 2D array, also determining the number of rows and columns.

Pattern Search Functions:

search_p1: Searches for the occurrence of pattern horizontally within the strs array and prints the starting coordinates if found.

search_p2: Searches for the occurrence of pattern2 vertically within the strs array and prints the starting coordinates if found.

search_p3: Searches for the occurrence of pattern3 diagonally (top-left to bottom-right) within the strs array and prints the starting coordinates if found.

There is some outputs in below:

```
*-*-*-*    MENU    *-*-*-*
1. Sort and display all individuals by age
2. Sort and display  individuals in the branch by age
3. Show  individuals with the branch 'SCIENCE'
4. Show  computer scientist who are not mathematicians
5. EXİT
Choice 2
name                surname              age                 branch1             branch2
Janaki              Ammal                67                 BOTANY              CYTOGENETICS
Asuman              Baytop               95                 BOTANY              PHARMACY
Dmitri              Mendeleev            63                 CHEMISTRY
Aziz                Sancar               77                 CHEMISTRY           MEDICINE
Marie               Curie                67                 CHEMISTRY           PHYSICS
John                Dalton               78                 CHEMISTRY           PHYSICS
Ada                 Lovelace             37                 COMPUTER SCIENCE
John von            Neumann              54                 COMPUTER SCIENCE
Grace               Hopper               41                 COMPUTER SCIENCE    MATHEMATICS
Alan                Turing               42                 COMPUTER SCIENCE    MATHEMATICS
Charles             Darwin               73                 GENETICS            EOLOGY
Gregor              Mendel               62                 GENETICS            MATHEMATICS
Cahit               Arf                  87                 MATHEMATICS
Hypatia                                  35                 MATHEMATICS         PHILOSOPHY
Mehmet              Oz                   63                 MEDICINE
Özlem               Tureci               57                 MEDICINE            IMMUNOLOGY
Aristo                                   62                 PHILOSOPHY
Sokrates                                 70                 PHILOSOPHY
Albert              Einstein             76                 PHYSICS
Behram              Kursunoglu           81                 PHYSICS
Isaac               Newton               84                 PHYSICS
Canan               Dagdeviren           38                 PHYSICS             MATERIALS SCIENCE
Feza                Gursey               71                 PHYSICS             MATHEMATICS
1. Sort and display all individuals by age
2. Sort and display  individuals in the branch by age
3. Show  individuals with the branch 'SCIENCE'
4. Show  computer scientist who are not mathematicians
5. EXİT
Choice 1
name                surname              age                 branch1             branch2
Hypatia                                  35                 MATHEMATICS         PHILOSOPHY
Ada                 Lovelace             37                 COMPUTER SCIENCE
Canan               Dagdeviren           38                 PHYSICS             MATERIALS SCIENCE
Grace               Hopper               41                 COMPUTER SCIENCE    MATHEMATICS
Alan                Turing               42                 COMPUTER SCIENCE    MATHEMATICS
John von            Neumann              54                 COMPUTER SCIENCE
Özlem               Tureci               57                 MEDICINE            IMMUNOLOGY
Aristo                                   62                 PHILOSOPHY
Gregor              Mendel               62                 GENETICS            MATHEMATICS
Mehmet              Oz                   63                 MEDICINE
Dmitri              Mendeleev            63                 CHEMISTRY
Janaki              Ammal                67                 BOTANY              CYTOGENETICS
Marie               Curie                67                 CHEMISTRY           PHYSICS
Sokrates                                 70                 PHILOSOPHY
Feza                Gursey               71                 PHYSICS             MATHEMATICS
Charles             Darwin               73                 GENETICS            EOLOGY
Albert              Einstein             76                 PHYSICS
Aziz                Sancar               77                 CHEMISTRY           MEDICINE
John                Dalton               78                 CHEMISTRY           PHYSICS
Behram              Kursunoglu           81                 PHYSICS
Isaac               Newton               84                 PHYSICS
Cahit               Arf                  87                 MATHEMATICS
Asuman              Baytop               95                 BOTANY              PHARMACY
```

```
*-*-*-*    MENU    *-*-*-*
1. Sort and display all individuals by age
2. Sort and display  individuals in the branch by age
3. Show  individuals with the branch 'SCIENCE'
4. Show  computer scientist who are not mathematicians
5. EXİT
Choice 4
Cahit              Arf               87                MATHEMATICS
Hypatia                              35                MATHEMATICS         PHILOSOPHY
```

```
P1 @ (1,3)
P1 @ (5,9)
P2 @ (1,1)
P2 @ (1,6)
P2 @ (1,7)
P2 @ (1,8)
P2 @ (1,31)
P3 @ (1,1)
P3 @ (1,25)
```