Homework #1

Structure

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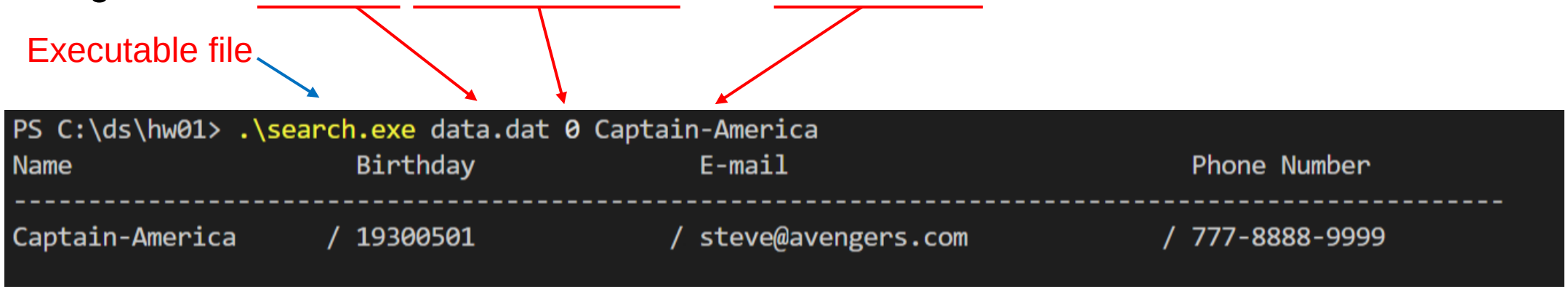
Requirements

- Implement a program which finds the data from the contacts file and displays the all attributes related to search data

- Required programming skills
  - Command line argument
  - Structures and array
  - Selection sort
  - Binary search

Requirements

- The program should
  - Run program with command line arguments
    - Arguments: data file, column number, and search data



    - Use argc and argv (see p.9~12)
  - Check the number of arguments (= 4)
  - Check the range of column numbers
    - In this homework, the program only considers four columns (i.e., attributes); name, birthday, e-mail, and phone number

Requirements

- The program should
  - Read data from the file and store the data using structure array
    - All variables in structure are string (character array)
  - Sort data by ascending order in terms of column number
    - Use selection sort algorithm
  - Search data from the sorted data
    - Use binary search algorithm
  - Display all attributes of found data
    - If not found, display ‘Not Found’ message.

Requirements

- Structure

```
struct contact {
    char name[30];
    char birthday[10];
    char email[30];
    char phone[20];
};
```

Requirements

- Your source should be executed in visual studio code.
- Add proper comment in your source code.
- Upload your source code only on LMS (not zip file)
  - File name: hw01_student id.c (ex: hw01_20400022.c)
- Due date: 11pm, 3/22 (Mon)

Expected Results

- Expected Results

```
PS C:\ds\hw01> .\search.exe data.dat 2
Usage: C:\ds\hw01\search.exe <Data File> <Column Number> <Search Data>

PS C:\ds\hw01> .\search.exe data.dat 4 Iron-Man
Column range should be 0 ~ 3!

PS C:\ds\hw01> .\search.exe data.dat 0 Iron-Man
Name                    Birthday                E-mail                          Phone Number
-------------------------------------------------------------------------------------------------
Iron-Man              / 19600301              / tony@avengers.com             / 111-2222-3333

PS C:\ds\hw01> .\search.exe data.dat 1 Iron-Man
Iron-Man Not Found!!
```

Expected Results

- Expected Results

```
PS C:\ds\hw01> .\search.exe data.dat 0 Captain-America
Name                    Birthday                E-mail                                  Phone Number
-------------------------------------------------------------------------------------------------------
Captain-America      / 19300501              / steve@avengers.com              / 777-8888-9999

PS C:\ds\hw01> .\search.exe data.dat 2 19300501
19300501 Not Found!!

PS C:\ds\hw01> .\search.exe data.dat 1 19300501
Name                    Birthday                E-mail                                  Phone Number
-------------------------------------------------------------------------------------------------------
Captain-America      / 19300501              / steve@avengers.com              / 777-8888-9999

PS C:\ds\hw01> .\search.exe data.dat 2 bruce@avengers.com
Name                    Birthday                E-mail                                  Phone Number
-------------------------------------------------------------------------------------------------------
Hulk                 / 19740801              / bruce@avengers.com              / 123-4567-9999

PS C:\ds\hw01> .\search.exe data.dat 3 123-4567-9999
Name                    Birthday                E-mail                                  Phone Number
-------------------------------------------------------------------------------------------------------
Hulk                 / 19740801              / bruce@avengers.com              / 123-4567-9999

PS C:\ds\hw01> .\search.exe data.dat 0 Hulk2
Hulk2 Not Found!!
```

COMMAND LINE ARGUMENT

Command Line Argument

- When executing a program in either C or C++ there is a way to pass command line arguments.
- Passed a character arrays.
- Each parameter separated by a space
- Comes into the program as two arguments
  - argc: number of parameters
  - argv: parameter list

Command Line Argument

- Conventional rules:
  - Arguments are always passed to main().
  - There must be two
    - first is an integer → int argc
    - second char pointer to an array → char *argv[]
  - First argument (argv[0]) will always be the name of the calling program.
  - argc will always be at least 1
  - The first argument is always argv[0]
  - The last argument is always argv[argc-1]
  - argv[argc] will always be a null pointer
  - Arguments are always passed as character strings. Numbers must be converted from characters to integers, floats, doubles, etc.

Command Line Argument

- Example

```c
#include <stdio.h>
#include <stdlib.h>

int main(int argc, char *argv[])
{
    int i;
    printf("Command Line Arguments!\n");
    printf("argc = %d\n", argc);
    for (i = 0; i < argc; i++)
    {
        // Print arguments
        // atoi: convert string to integer type value if the string is integer
        printf("argv[%d] = %s (%d) \n", i, argv[i], atoi(argv[i]));
    }
    return 0;
}
```

```
PS C:\ds\hw01> .\arg.exe handong global university
Command Line Arguments!
argc = 4
argv[0] = C:\ds\hw01\arg.exe (0)
argv[1] = handong (0)
argv[2] = global (0)
argv[3] = university (0)
PS C:\ds\hw01> .\arg.exe handong 1 2 data structures
Command Line Arguments!
argc = 6
argv[0] = C:\ds\hw01\arg.exe (0)
argv[1] = handong (0)
argv[2] = 1 (1)
argv[3] = 2 (2)
argv[4] = data (0)
argv[5] = structures (0)
```