

Koneru Lakshmaiah Education Foundation
(Deemed to be University)

FRESHMAN ENGINEERING DEPARTMENT

Department of BES-1

A Project Based Lab Report

On

SINKING SHIP

SUBMITTED BY:

I.D NUMBER

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UNDER THE ESTEEMED GUIDANCE OF

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CERTIFICATE

This is to certify that the project based laboratory report entitled “SINKING SHIP” submitted by Mr./Ms. **I.VEDA SAI PRIYA** bearing Regd. No. **2100031238** to the **Department of Basic Engineering Sciences, KL University** in partial fulfillment of the requirements for the completion of a project-based Laboratory in “Computational Thinking for Structured Design” course in I B Tech I Semester, is a bonafide record of the work carried out by him/her under my supervision during the academic year 2021 – 2022.

PROJECT SUPERVISOR

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ACKNOWLEDGEMENTS

It is great pleasure for me to express my gratitude to our honorable President **Sri. Koneru Satyanarayana**, for giving the opportunity and platform with facilities in accomplishing the project -based laboratory report.

I express the sincere gratitude to our Director **Dr. A. Jagdeesh** for his administration towards our academic growth.

I express sincere gratitude to our Coordinator and HOD-BES **Dr. D. Haritha** for her leadership and constant motivation provided in successful completion of our academic semester. I record it as my privilege to deeply thank for providing us the efficient faculty and facilities to make our ideas into reality.

I express my sincere thanks to our project supervisor **E. RAJESH KUMAR** for his/her novel association of ideas, encouragement, appreciation and intellectual zeal which motivated us to venture this project successfully.

Finally, it is pleased to acknowledge the indebtedness to all those who devoted themselves directly or indirectly to make this project report success.

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ABSTRACT

To complete our project SNIKING SHIP, we will be dealing with some concepts like structure array, loops, conditional statements and strings which are related to C. The C Language is developed by Dennis Ritchie for creating system applications that directly interact with the hardware devices .C programming is considered as the base for other programming languages.

In this project our task is to read two inputs, name and status in single line exactly separated by single space for n crew members. Then only their names have to be displayed based on priority order to evacuate all the crew members in sinking ship.

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INTRODUCTION

There are n crew members in a ship. Unfortunately, the ship has crashed and it is sinking. Now our task is to evacuate all crew members in ship in view of a priority order. The priority order is as follows first rats need to leave the ship. Later women and children are given the same priority to evacuate. So, in this case who stands left that means whose number in the line is less when they are arranged from left to right with positive integers from 1 to n , will be the first to leave the ship. Then all men are evacuated from the ship. Finally, captain leaves the sinking ship.

As we have to store data for n crew members, we are using structure array. We have to take a structure with structure name `Crew_members` containing structure members of character array (strings) as name and status. This structure takes structure array variable.

We have to give number of crew members as input to the first line and next n lines follows each containing name and status of all crew members exactly separated by one space. status can take the values rat, woman, child, man and captain. Finally, we have to display only their names.

Hence, all can be evacuated from the sinking ship by following the given order strictly. So, we are using structures, strings, loops and conditional statements to do our project.

AIM:

To determine the order to evacuate all crew members in a sinking ship.
(SINKING SHIP)

Advantages:

Loops

- It helps the code to shorten the hundreds of lines to just a few.
- Loops helps the code to repeat as many times we needed.
- It takes less memory space

Strings

- compile time allocation and determination of size.
- The size of the stored string is variable and changeable.
- The strings can be summed up as ease of use, initialization support and compatibility to existing interfaces.

Condition statements

- It can organize a program into logical segments of code that run only if certain conditions are met.
- Allow us to control what the program does and perform different actions based on 'if'.
- Easier to read equivalent statements.

Structures

- Structs are marginally faster at runtime than classes
- Due to optimizations done by compiler we can enforce full immutability

Disadvantages:

Loops

- Implementation of loops can be a challenging task.
- If we not coded properly there is a possibility of entering an infinite loop.

Strings

- Strings boil down to inflexibility
- It is fixed size
- Less intuitive notation for such usage

Condition statements

- Doesn't work with floats and strings etc.
- Doesn't work with variable conditions.
- Doesn't work with range

Structures

- Weaking of common bonds
- Lack of coordination
- Territorial disputes

Future enhancements:

Our project can be used as a reference for those who wish to do research on a similar project like us in the future. Since C language allows direct access to physical addresses and can operate directly on hardware, it has both functions of high-level languages and many functions of low-level language. It can operate to bits, bytes, and addresses like assembly language, which are the most basic unit of work of a computer and can be used to write system software.

SYSTEM REQUIREMENTS

➤ SOFTWARE REQUIREMENTS:

The major software requirements of the project are as follows:

Language: Turbo-C, DEV C++

Operating system: Windows Xp or later.

➤ HARDWARE REQUIREMENTS:

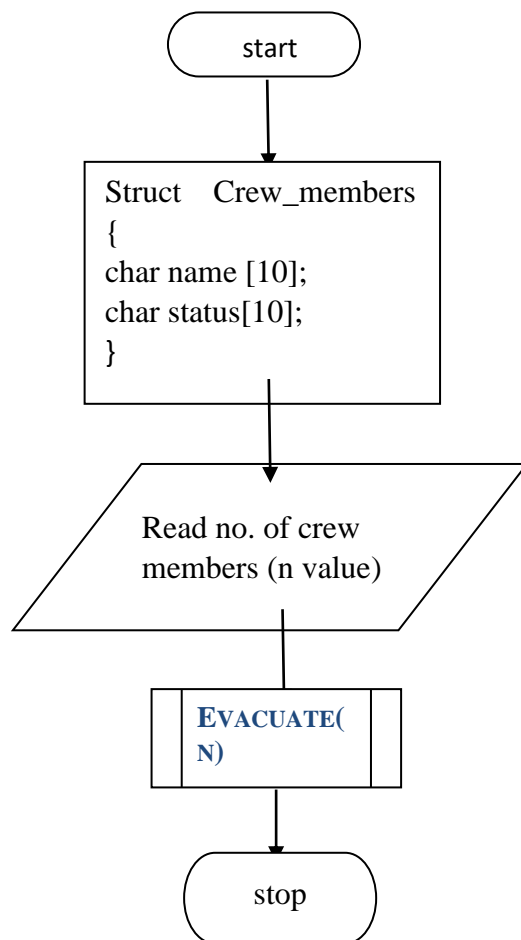
The hardware requirements that map towards software are as follows:

RAM: 16.0 GB (13.9 GB usable)

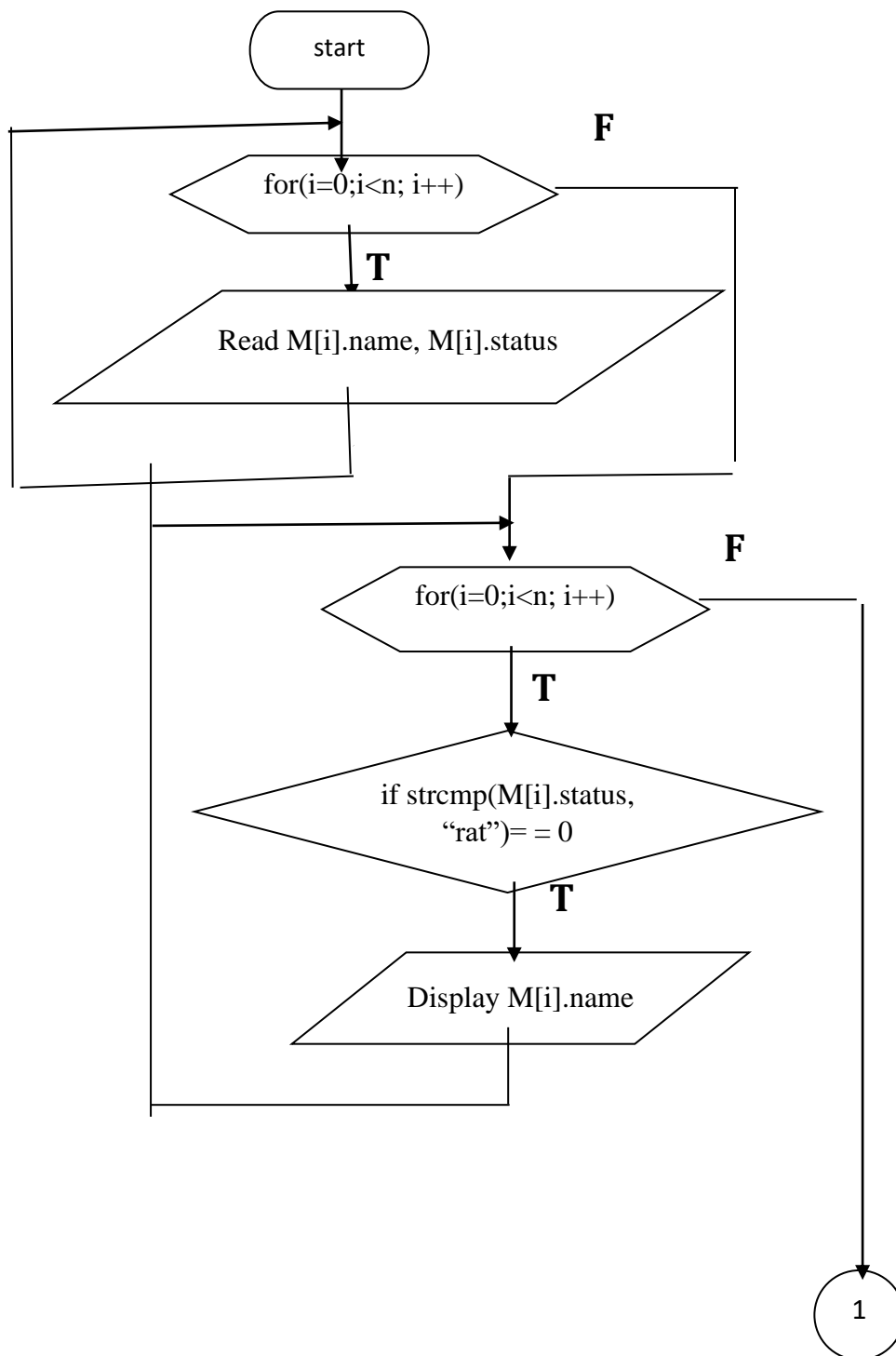
Processor: AMD Ryzen 75700 U with Radeon Graphics 1.80 GHz

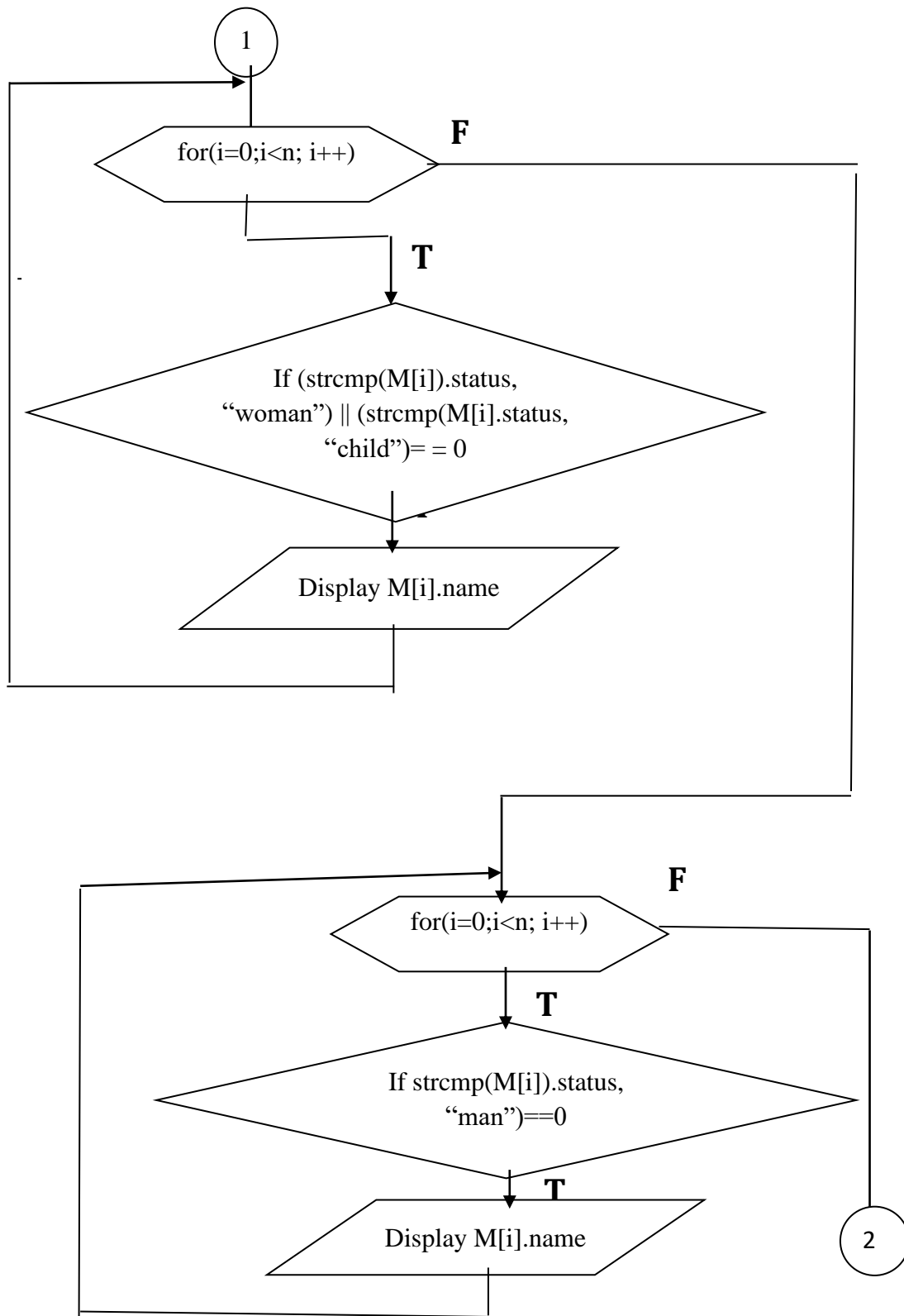
DATA FLOW DIAGRAM

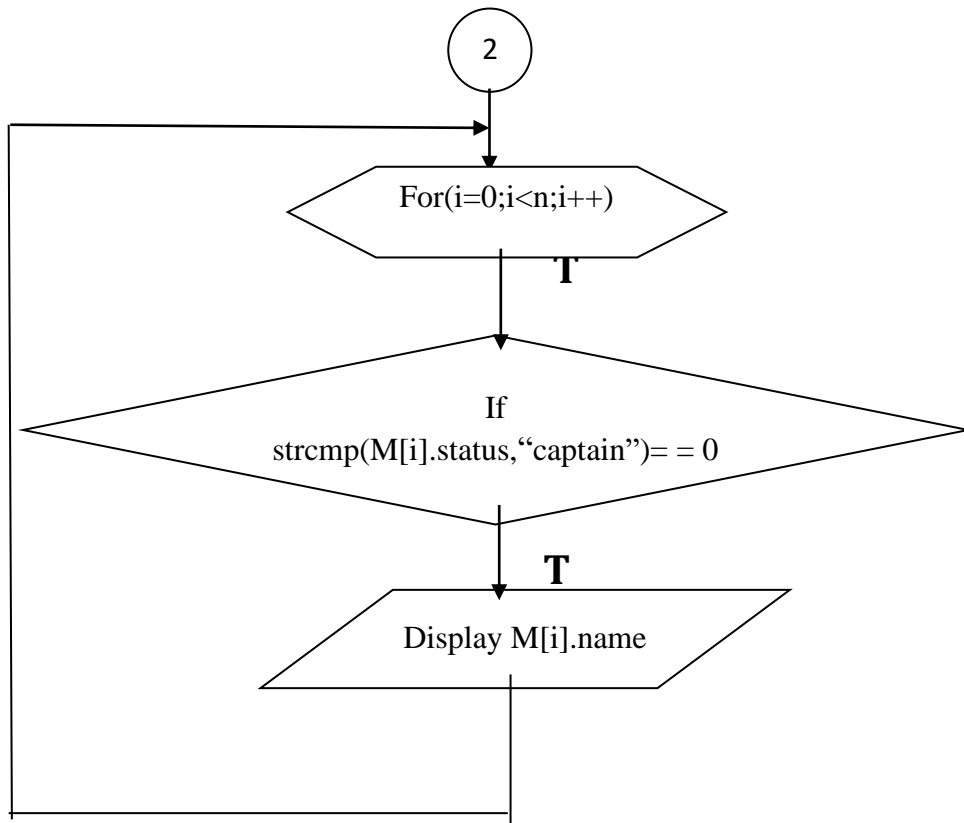
Flowchart for main method:



Flowchart for Evacuate method:







ALGORITHM

Algorithm for main method:

Step:1 Start

Step:2: struct Crew_members

```
{  
    char name [10];  
    char status [10];  
} M [100];
```

Step 3: Read no. of crew members (n value)

Step 4: Call function, Evacuate(n)

Step5: Stop

Algorithm for Evacuate method:

Step:1 start

Step 2: for (i=0; i<n; i++)

Step 2.1: Read M[i].name, M[i].status

Step:3 for(i=0;i<n; i++)

Step 3.1: If strcmp(M[i].status, "rat") == 0

Step 3.2: Display M[i].name

Step:4 for(i=0;i<n; i++)

Step 4.1: If (strcmp(M[i].status, "woman" || strcmp(M[i].status, "child") == 0

Step 4.2: Display M[i].name

Step:5 for(i=0;i<n; i++)

Step 5.1: If strcmp(M[i].status, "man") == 0

Step 5.2: Display M[i].name

Step:6 for(i=0;i<n; i++)

Step 6.1: If strcmp(M[i].status, "captain") == 0

Step 6.2: Display M[i].name

IMPLEMENTATION

```
#include<stdio.h>
#include<string.h>
struct Crew_members
{
    char name [10];
    char status [10];
}M [100];
void Evacuate (int n);
int main ( )
{
    int n;
    scanf("%d", &n); //number of crew members in ship
    Evacuate(n);
    return 0;
}
void Evacuate (int n)
{
    int i;
    for ( i=0;i<n; i++)
    {
        scanf("%s%s", M[i].name, M[i].status);
    }
    for (i=0;i<n;i++)
    {
        If (strcmp(M[i].status,"rat")==0)
```

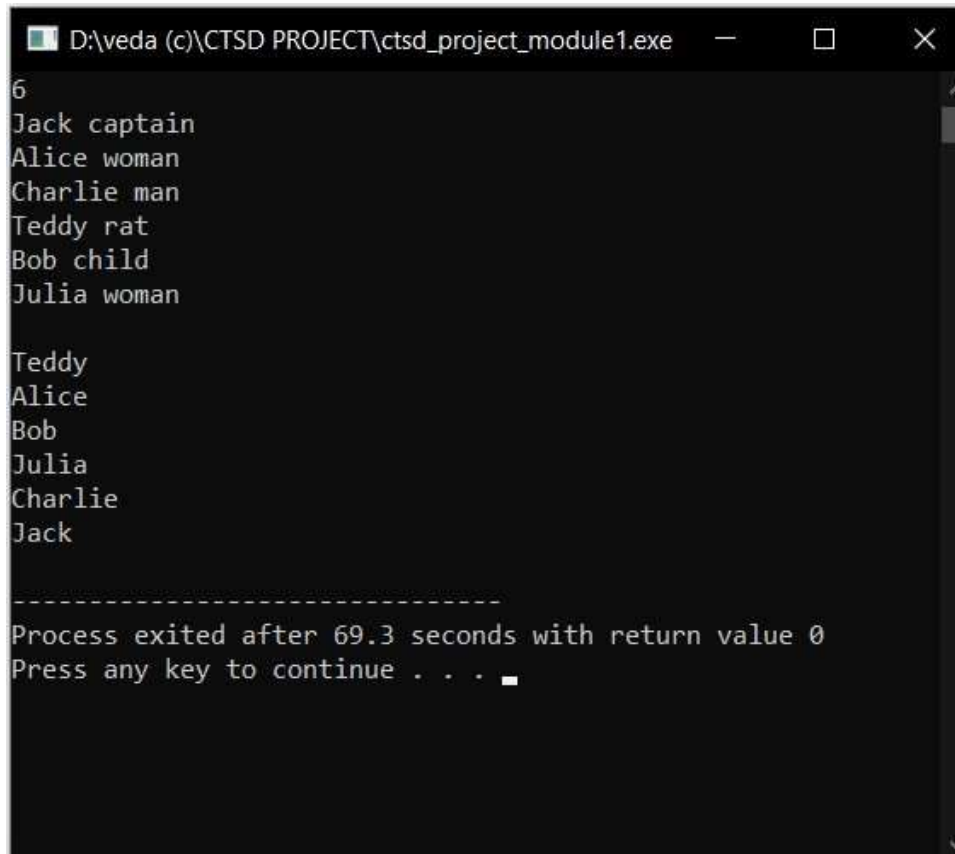
```
        printf("\n%s\n",M[i].name);
    }
    for ( i=0;i<n;i++)
    {
        if(strcmp(M[i].status,"woman")==0||strcmp(M[i].status,"child")==0)
            printf("%s\n",M[i].name);
    }

    for ( i=0;i<n;i++)
    {
        if(strcmp(M[i].status,"man")==0)
            printf("%s\n",M[i].name);
    }
    for ( i=0;i<n;i++)
    {
        if(strcmp(M[i].status,"captain")==0)
            printf("%s\n",M[i].name);
    }
}
```


INTEGRATION AND SYSTEM TESTING

OUTPUTS

Screen Shots:



```
D:\veda (c)\CTSD PROJECT\ctsd_project_module1.exe
6
Jack captain
Alice woman
Charlie man
Teddy rat
Bob child
Julia woman

Teddy
Alice
Bob
Julia
Charlie
Jack

-----
Process exited after 69.3 seconds with return value 0
Press any key to continue . . .
```

CONCLUSION

By using c language, we found a solution to solve this problem with the help of some concepts like structures, strings, conditional statements and loops. Finally, all crew members are evacuated from the sinking ship according to strict order. This project is so helpful to improve our knowledge on strings and structures.