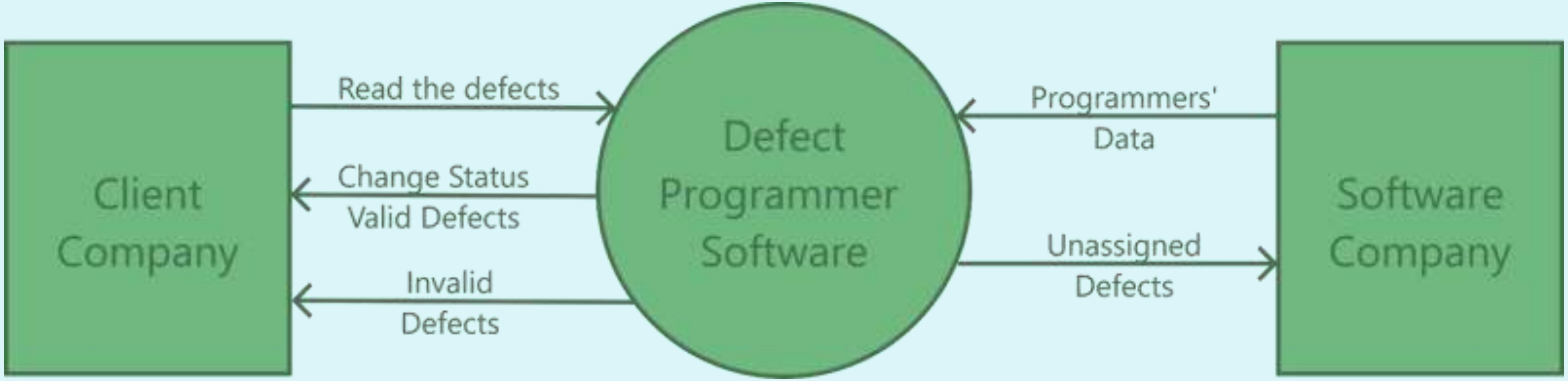
DEFECT PROGRAMMER ASSIGNMENT

CAPGEMINI
SPRINT -1
GROUP 3

THE PROJECT IDEA

To develop a software that automatically assigns the defects reported by the client company to programmers depending on the functional area they are handling.

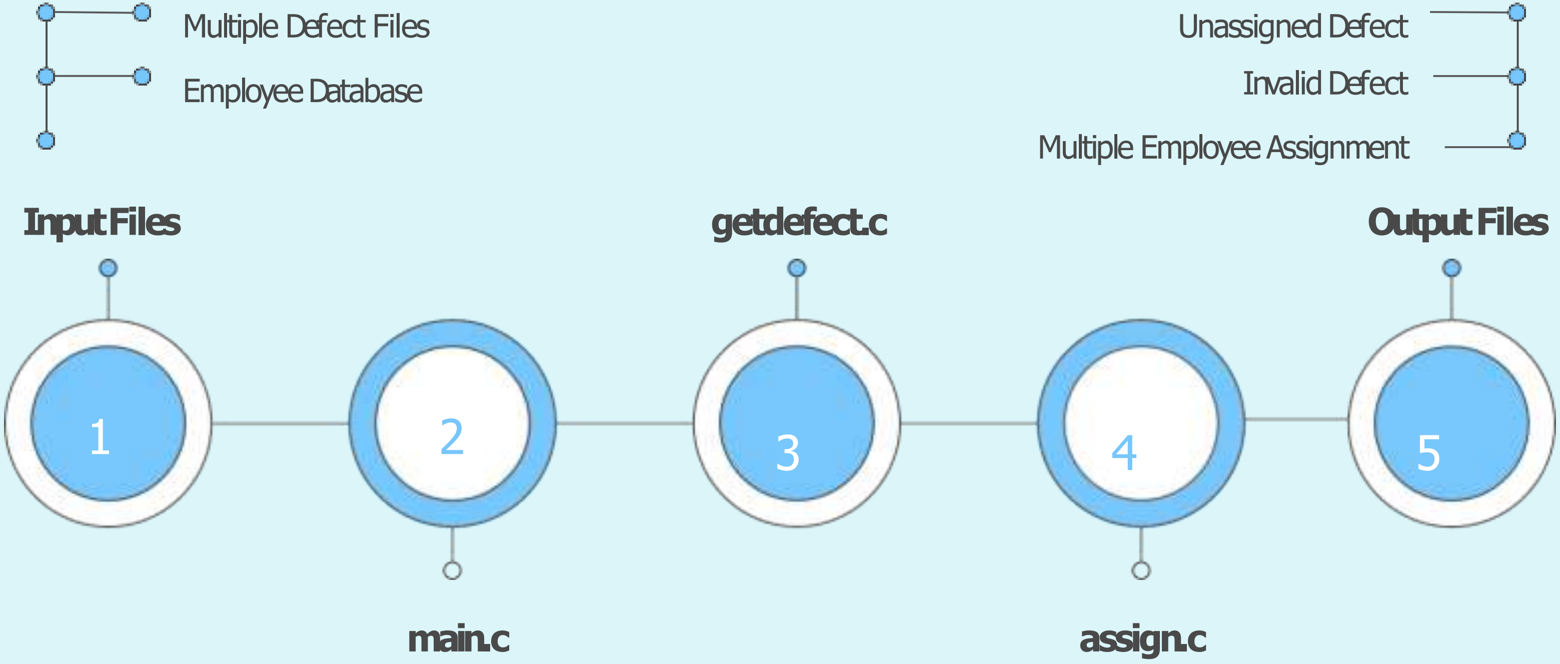
Our Solution



REQUIREMENTS

- Multi threading
- Dynamic memory allocation
- File input output handling
- Data structures(Array)
- Make file
- Valgrind
- CUnit

Program Flow



Multiple Defect Files

Employee Database

Unassigned Defect

Invalid Defect

Multiple Employee Assignment

Input Files

main.c

getdefect.c

assign.c

Output Files

01

main.c

STRUCTURES

01

Defect

```
Struct defect{
Char *defectID;
Char *description;
Char *moduleName;
Char *functionalArea;
Char *date;
Char *status;
Char *type;
};
```

02

Employee

```
Struct employee{
Char *Id;
Char *Name;
Char *BUnit;
Char *Expertise;
Char *Designation;
Pthread_mutex_t emplock;
Int n_defect;
Defect *assigned_arr[MAX];
};
```

1.main()

- Input Defect files are taken as command line arguments and also validates them.

- Separate threads are created for each input files and these files are passed to getDefect() Function.

- It calls getEmployee() function to fetch data from Employee Database.

- Finally it waits for all threads to complete their work

.

2. getEmployee()

- ❖It opens “employee.txt” database file.
- ❖Now it reads the file line by line, each line contains information of one employee.
- ❖It stores this information inside Employee Structure.
- ❖Displays error if file can't be opened for any reason.

02

getdefect.c

Functions

1.Get Defect

Reads defects from the input and and calls checkvalidity and call assignEmployee for valid defect

2. Check Validity

Returns true if count is equal to 7 and else return false

3. Valid defect

It stores the valid defect in Defect structure

4. Invalid Defect

Display invalid defect message and append it into invalidDefect.txt

1.GetDefect()

- It reads defects from the input file

- Calls checkvalidity if true call validDefect() Else call invaliddefect()

- It calls assignEmployee() for valid defect

…

2. CheckValidity()

- ❖We initialize count =0;
- ❖It divides the string into token using strtok And increment count for each attribute

- ❖: is delimiter
- ❖char *token =strtok(s, ":");

- ❖If count is equal to 7, it returns true Else returns false

3. ValidDefect()

It tokenizes the string using strtok with And dynamically allocates memory and stores them into their respective Attribute in defect structure.

4. InvalidDefect()

- It display invalid defect message with defect id and appends it into invalidDefect.txt

03

assign.c

Functions

01 **assignEmployee()**

Checks for defects with status as open.

02 **searchProgrammer()**

Searches for programmer suitable of open defect.

03 **unassignedDefect()**

Copies all unassigned Defect into separate text file.

04 **createEmployeeFile()**

Creates separate files for each programmer who have at least one defect assigned to him

1. assignEmployee()

- ➢It loops through all defects and checks their status.

- ➢If status is open then it calls searchProgrammer() Function.

- ➢Defects with any other status are ignored.

2. searchProgrammer()

Now for each defect passed, it searches for programmer in the array.

Search Criteria:

- Functional Area of Defect shall match with Expertise of Programmer.

- If there is a match, the defect is assigned to the programmer and createEmployeeFile() Function is called.

- If no programmer could be found then uassignedDefect() Function is called for that defect.

3. Unassigned Defect()

- ➢Now it opens **“unassignedDefect.txt”** file and appends all information of current defect to the last line of the file.
- ➢If file is not present it creates a new one.
- ➢Displays proper error if there is any issue with opening or writing inside this file.

4. Create Employee File()

- Creates separate file for each employee, if not present already, who have at least one defect assigned to them.

- Filename: **<EmpID>_assignments.txt**

- Appends employee and defect information into the file.

- Displays proper error if there is any issue with opening or closing of employee file.

Testing

Unit testing and Integration testing

Files

Defect.txt

defectID : description : moduleName : **Functional Area** : date : status : type

1. F001:Column values in BOM reports are incorrect:Aircraft design:BOM reports:21/08/2022:open:fatal
2. F002:Unit prices are not shown while preparing invoice:Invoices:Display products:23/04/2022:close:fatal
3. N001:BOMreport columns not aligned properly:Aircraft design:BOM reports:21/08/2022:open:niceToHave
4. O001:Aircraft:BOMreports:21/08/2022:open:niceToHave
5. F003:Column values in client dashboard not shown:Aircraft design:Manage customers:21/08/2022:open:fatal

Employee.txt

employeeID : Name : Business Unit : **Expertise** : Designation

1. A123:Suresh Panchal:UK Telecom:BOM report:Principal engineer
2. D012:J K Laxmi:Finacle Systems:Display products:Junior programmer
3. C015:Sandeep Khaire:UK Telecom:Manage customers:Senior programmer
4. D002:Mahesh Katkar:Pharmaceutical Systems:Licensing:Principal engineer
5. B011:Sreehari Bhaskar:DBMS Department:Data manager:Senior Analyst

TEST SUITE

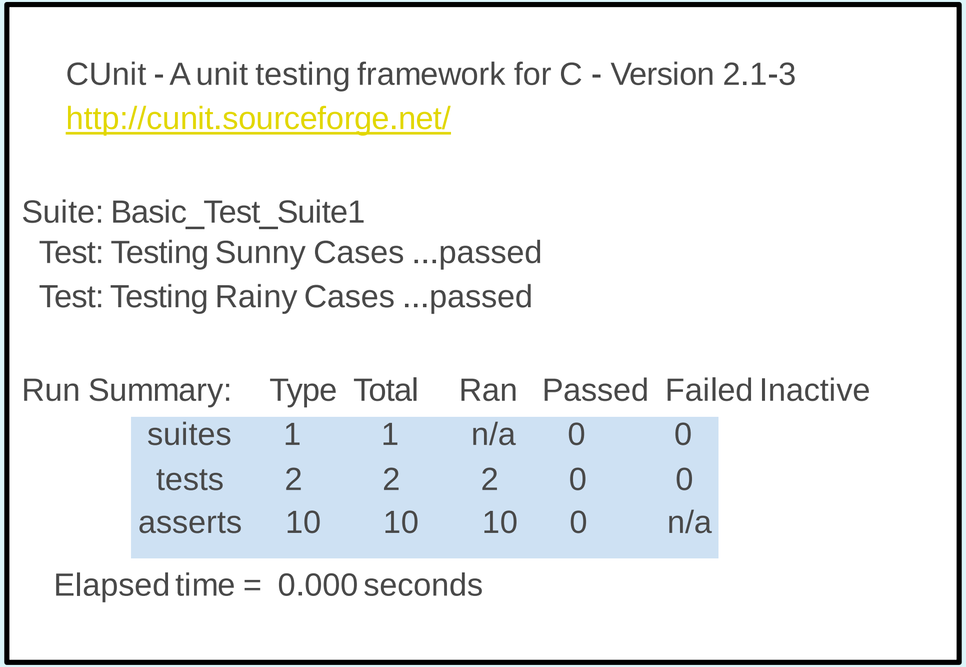
Sunny Test Cases

1. "F001:Column values in BOM reports are incorrect:Aircraft design:BOM report:21/08/2022:open:fatal";
2. "N001:BOM report columns not aligned properly:Aircraft design:BOM report:21/08/2022:open:niceToHave";
3. "F002:Unit prices are not shown while preparing invoice:Invoices:Display products:23/04/2022:close:fatal";

Rainy Test Cases

1. "ID01: : : ::open:";
2. "O001:Aircraft:BOM reports:21/08/2022:open:niceToHave";
3. "M001:Sed ut perspiciatis unde omnis iste:Aircraft design:consequatur:20/08/2022:open:lagging:lagging";

Unit Testing for checkValidity function



```
     CUnit - A unit testing framework for C - Version 2.1-3
     http://cunit.sourceforge.net/


Suite: Basic_Test_Suite1
  Test: Testing Sunny Cases ...passed
  Test: Testing Rainy Cases ...passed

Run Summary:    Type  Total    Ran  Passed  Failed Inactive
              suites      1      1    n/a      0        0
               tests      2      2      2      0        0
             asserts     10     10     10      0      n/a

   Elapsed time =  0.000 seconds
```

Check Validity()

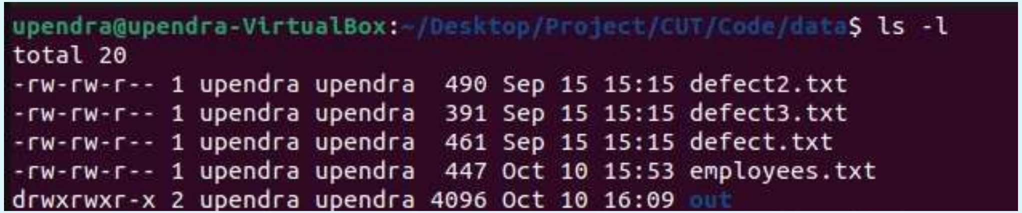
It takes one argument, that is :

1. String pointer

It divides the string into token using strtok And increment count for each.

If count is equal to 7, it returns true Else returns false

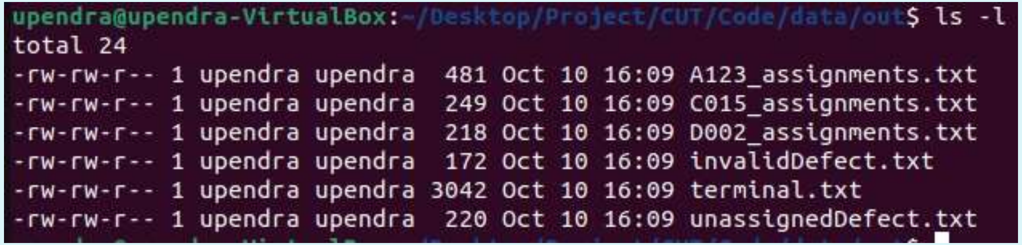
INTEGRATION TESTING FILES DIRECTORIES



```
upendra@upendra-VirtualBox:~/Desktop/Project/CUT/Code/data$ ls -l
total 20
-rw-rw-r-- 1 upendra upendra  490 Sep 15 15:15 defect2.txt
-rw-rw-r-- 1 upendra upendra  391 Sep 15 15:15 defect3.txt
-rw-rw-r-- 1 upendra upendra  461 Sep 15 15:15 defect.txt
-rw-rw-r-- 1 upendra upendra  447 Oct 10 15:53 employees.txt
drwxrwxr-x 2 upendra upendra 4096 Oct 10 16:09 out
```

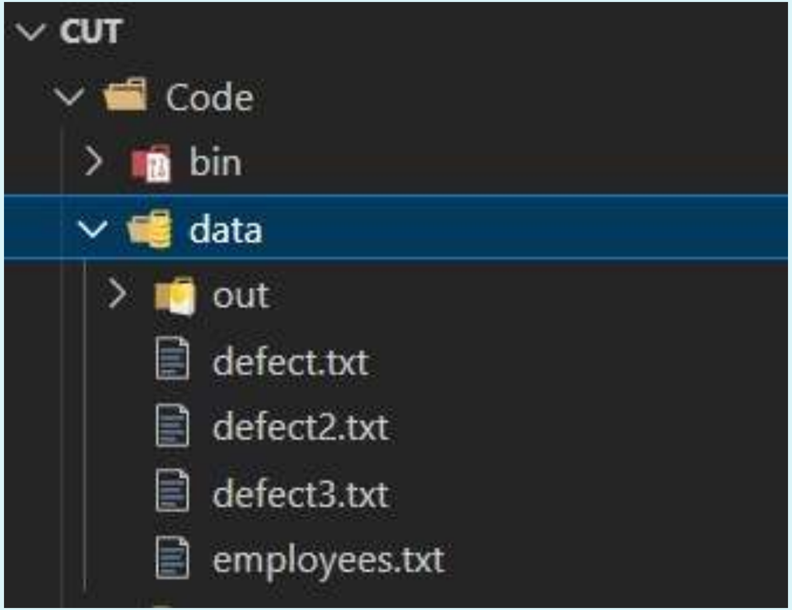
Input files

Output Files



```
upendra@upendra-VirtualBox:~/Desktop/Project/CUT/Code/data/out$ ls -l
total 24
-rw-rw-r-- 1 upendra upendra  481 Oct 10 16:09 A123_assignments.txt
-rw-rw-r-- 1 upendra upendra  249 Oct 10 16:09 C015_assignments.txt
-rw-rw-r-- 1 upendra upendra  218 Oct 10 16:09 D002_assignments.txt
-rw-rw-r-- 1 upendra upendra  172 Oct 10 16:09 invalidDefect.txt
-rw-rw-r-- 1 upendra upendra 3042 Oct 10 16:09 terminal.txt
-rw-rw-r-- 1 upendra upendra  220 Oct 10 16:09 unassignedDefect.txt
```

Integration Testing Output



INTEGRATION TESTING- TERMINAL OUTPUT

```
--- Total files in queue: 3 —
```

1

```
--- Total Employee: 7 ---

ID: A123 Name: Suresh Panchal
ID: D012 Name: Karan Karan
ID: C015 Name: Shreehari Khaire
ID: D002 Name: Mahesh Katkar
```

2

```
--- Creating Thread for file 1: /data/defect.txt ---
--- Creating Thread for file 2: /data/defect2.txt —
--- Processing file: ../data/defect.txt
Defect ID: O001 contains insufficient
information.
--- Creating Thread for file 3: /data/defect3.txt —
---  Processing  file:  ../data/defect2.txt
Defect  ID:  M001  contains  insufficient
information.
--- Cannot open file: ../data/defect3.txt
```

3

```
--- Total Valid Defects: 4 ---

ID:  F001  Status:  open
ID:  F002  Status:  close
ID:  N004  Status:  open
ID: K002 Status: open
```

4

PTO

```
--- Searching Programmer for defect Id: F001 ---
--- Searching Programmer for defect Id: N004 ---
```

```
Defect Id: F001
Status: Assigned
Module Name: Aircraft design
Functional Area: BOM report
Description: Column values in BOM reports are
incorrect

Has been assigned to:-
Employee Id: A123
Employee Name: Suresh Panchal
```

5

```
--- Searching Programmer for defect Id: N001 ---
Defect Id: N004
Status: Assigned
Module Name: Aircraft design
Functional Area: BOM report
Description: BOM report columns not aligned
properly

Has been assigned to:-
Employee Id: A123
Employee Name: Suresh Panchal
```

PTO

```
--- Searching Programmer for defect Id: F003 ---
--- Searching Programmer for defect Id: K002 ---

Defect Id: F003
Status: Assigned
Module Name: Aircraft design
Functional Area: Manage customers
Description: Column values in client dashboard
are not shown

Has been assigned to:-
Employee Id: C015
Employee Name: Shreehari Khaire

Defect Id: K002
Status: Assigned
Module Name: reprehenderit
Functional Area: BOM report
Description: sed quia non numquam eius modi
tempora incidunt

Has been assigned to:-
Employee Id: A123
Employee Name: Suresh Panchal


--- Searching Programmer for defect Id: K003 ---
--- Programmer not found for defect Id: K003 ---
```

6

TEAM CAPG-84 GROUP 3

- BHANU PRAKASH KORLEPARA
- SANDHYA G
- SUBHRANSU SAHU
- SWETHA GANGA
- UPENDRA GUPTA
- VENKATA SATYA LAKSHMI DIVYA VARUPULA

THANK YOU