Log Automation and Power Conservation

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Problem Statement

To develop a automated log control system for lab automation using the concept of stack

Product Features

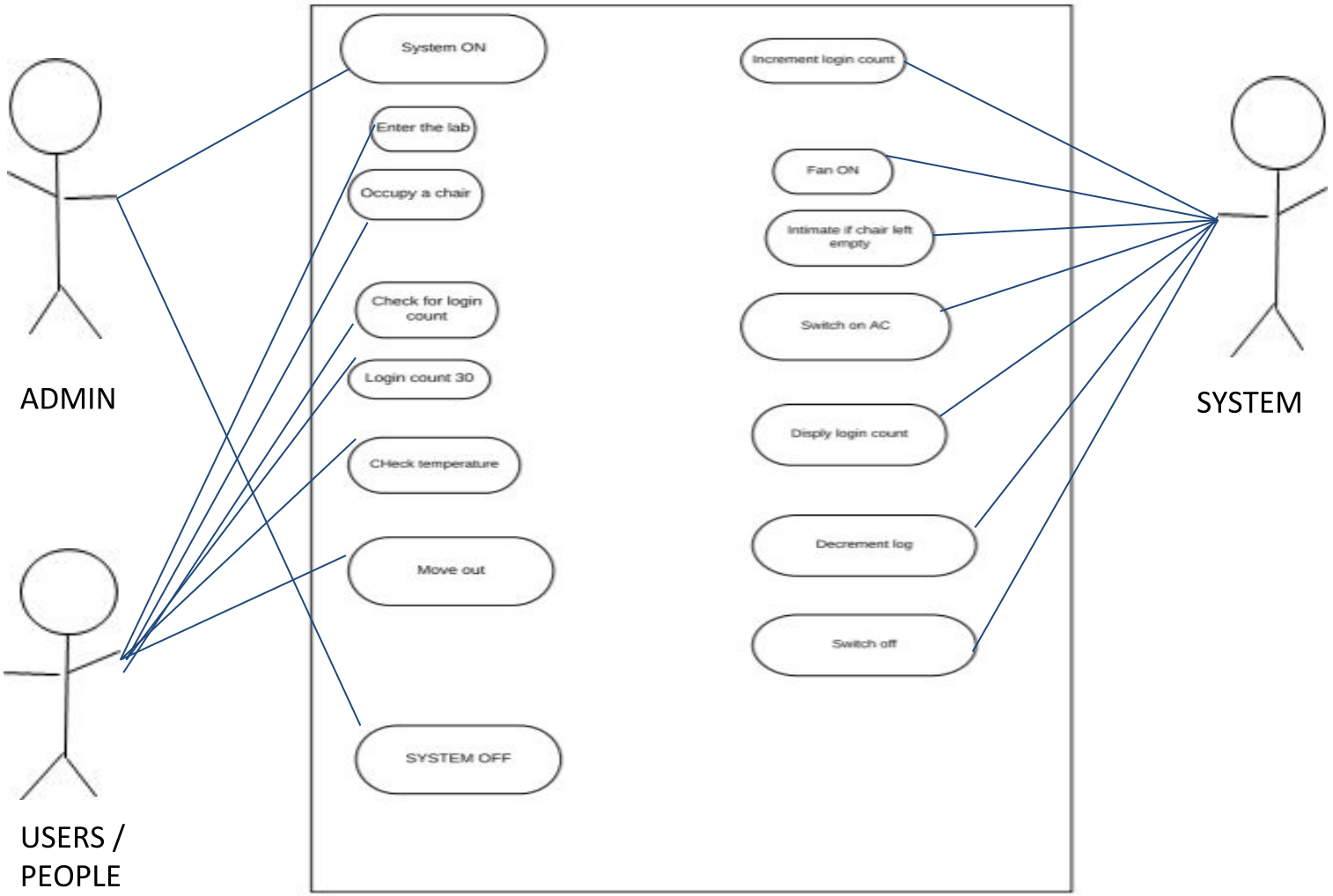
Functional requirements

1. The system shall allow the electrical devices to automatically switch on and off based on entry and exit of persons respectively .
2. The system shall allow the system to maintain log automatically.

Non-functional requirements

1. The system shall work efficiently irrespective of the users.
2. The system shall be scalable for larger areas like auditoriums.
3. The system shall not be harmful to the environment.
4. The system shall respond (log) within 1 second whenever a person enters in the lab.

Product Features



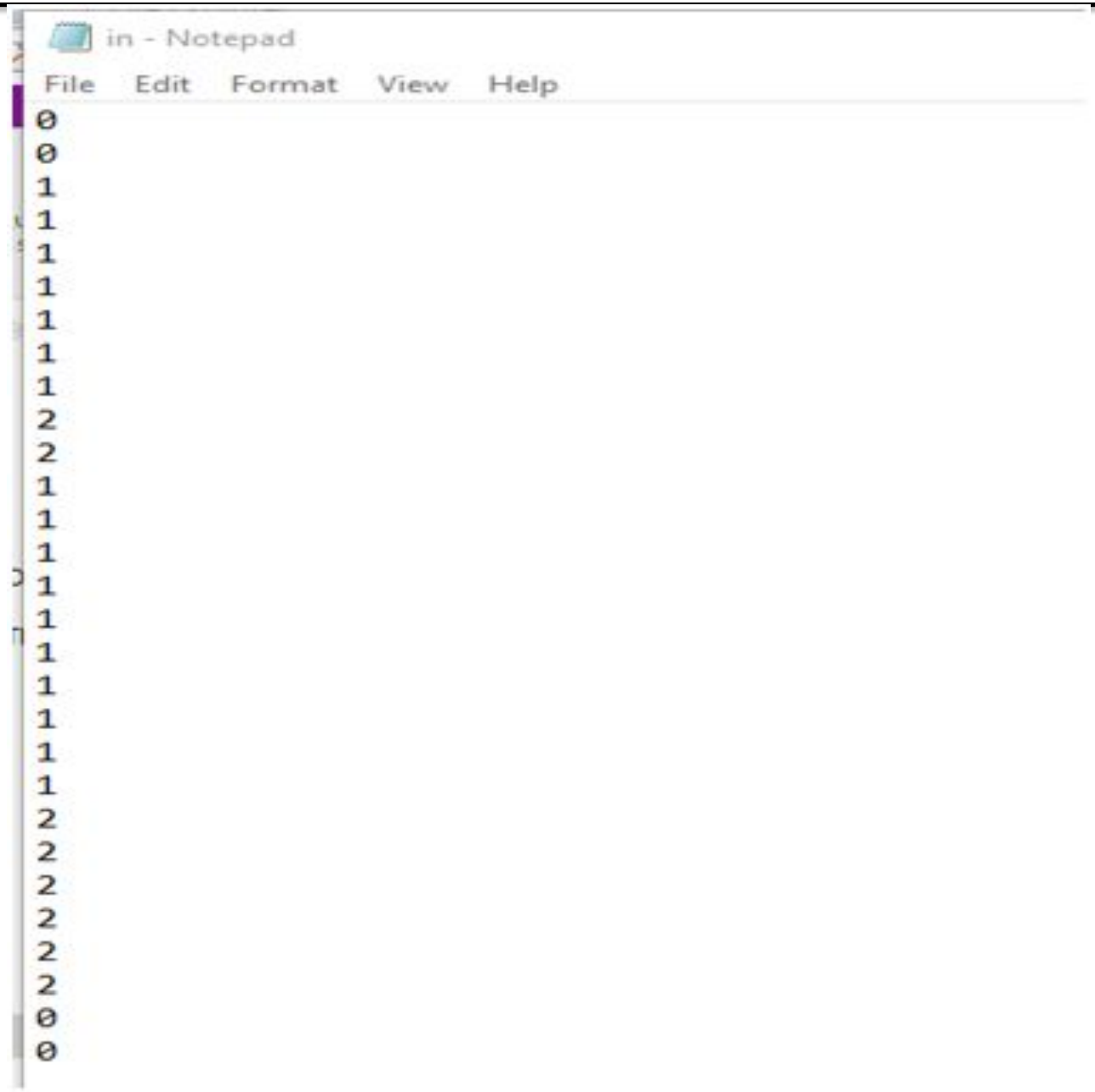
Modules

Requirement Description	Module Name	Module designed by
The system shall maintain log automatically using the detection of sensors , such that when a person enters log count gets incremented and when they leave it gets decremented.	Log count maintenance	
The system shall control the switching of electrical appliances automatically according to the response made from the log and sensors.	sensor detection	

Modules

Module Name	Data Structure Concept(s) used	Justification
Log maintenance	Stack	Using the concept of stack , we read the data from file and maintained the log as per our usage. Assuming to be, 1 = Represents that a person enters 2 = Represents that a person leaves 0 = Represents nothing (no action)

Demo - Screenshot 1



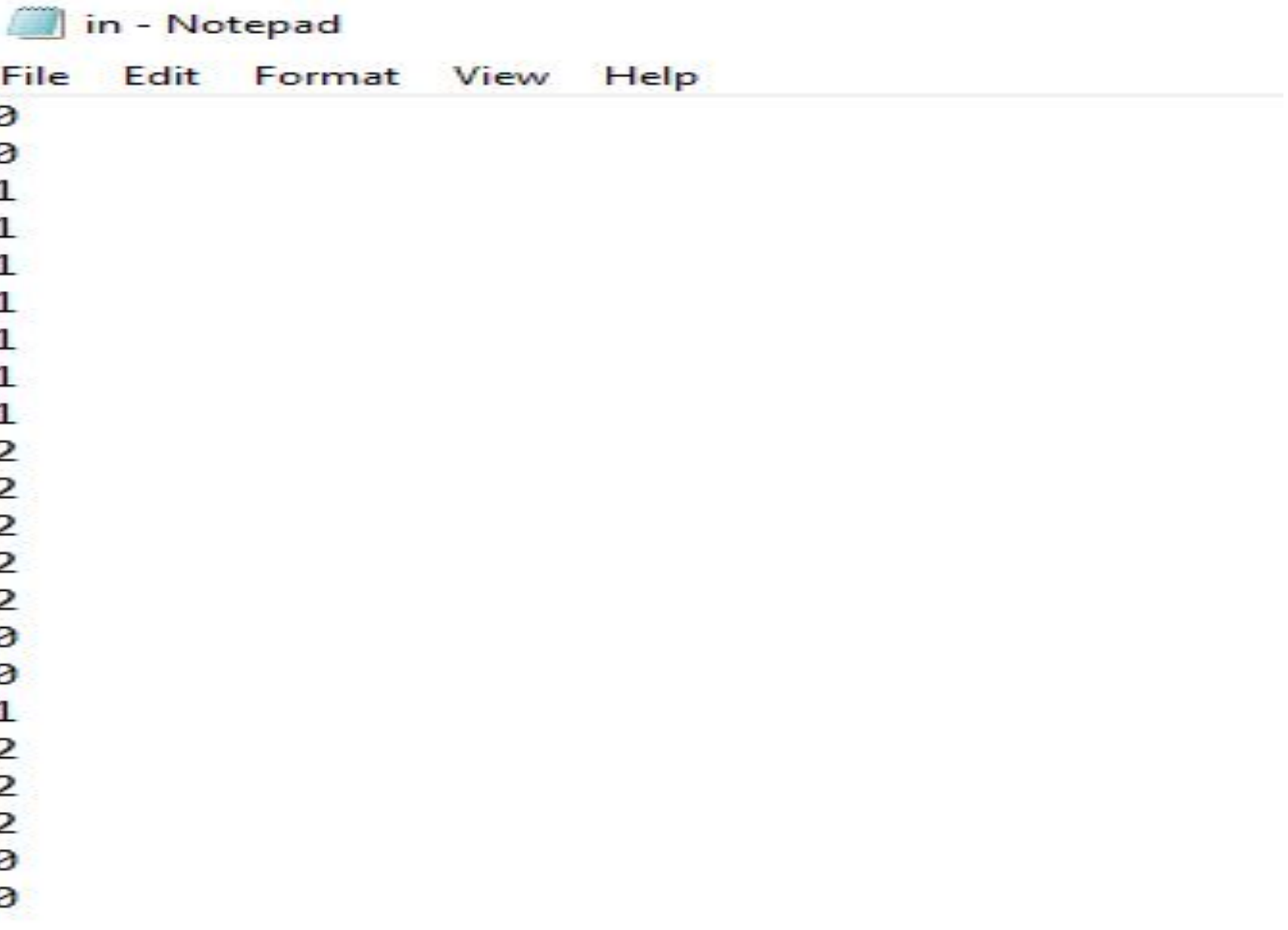
Demo - Screenshot 1 (Cont'd)

```
Log Details File openend and data is going be read...
A person is entering.....       Count is incremented to 1

Centralized light and fan on!! due to the existence of atleast 1 person


A person is entering.....       Count is incremented to 2

A person is entering.....       Count is incremented to 3

A person is entering.....       Count is incremented to 4

A person is entering.....       Count is incremented to 5

A person is entering.....       Count is incremented to 6

A person is entering.....       Count is incremented to 7

A person is leaving.....        Count is decremented to 6

A person is leaving.....        Count is decremented to 5

A person is entering.....       Count is incremented to 6

A person is entering.....       Count is incremented to 7

A person is entering.....       Count is incremented to 8

A person is entering.....       Count is incremented to 9

A person is entering.....       Count is incremented to 10

Air conditioner on!! due to the existence of atleast 10 persons


A person is entering.....       Count is incremented to 11

A person is entering.....       Count is incremented to 12

A person is entering.....       Count is incremented to 13
```

Demo - Screenshot 1 (Cont'd)

```
A person is entering.....       Count is incremented to 14

A person is entering.....       Count is incremented to 15

A person is leaving.....        Count is decremented to 14

A person is leaving.....        Count is decremented to 13

A person is leaving.....        Count is decremented to 12

A person is leaving.....        Count is decremented to 11

A person is leaving.....        Count is decremented to 10

A person is leaving.....        Count is decremented to 9


Air conditioner off!! due to the existence of people less than 10


The persons in the room is (The status of the stack is) : 1 1 1 1 1 1 1 1 1
Process returned 0 (0x0)   execution time : 0.267 s
Press any key to continue.
```

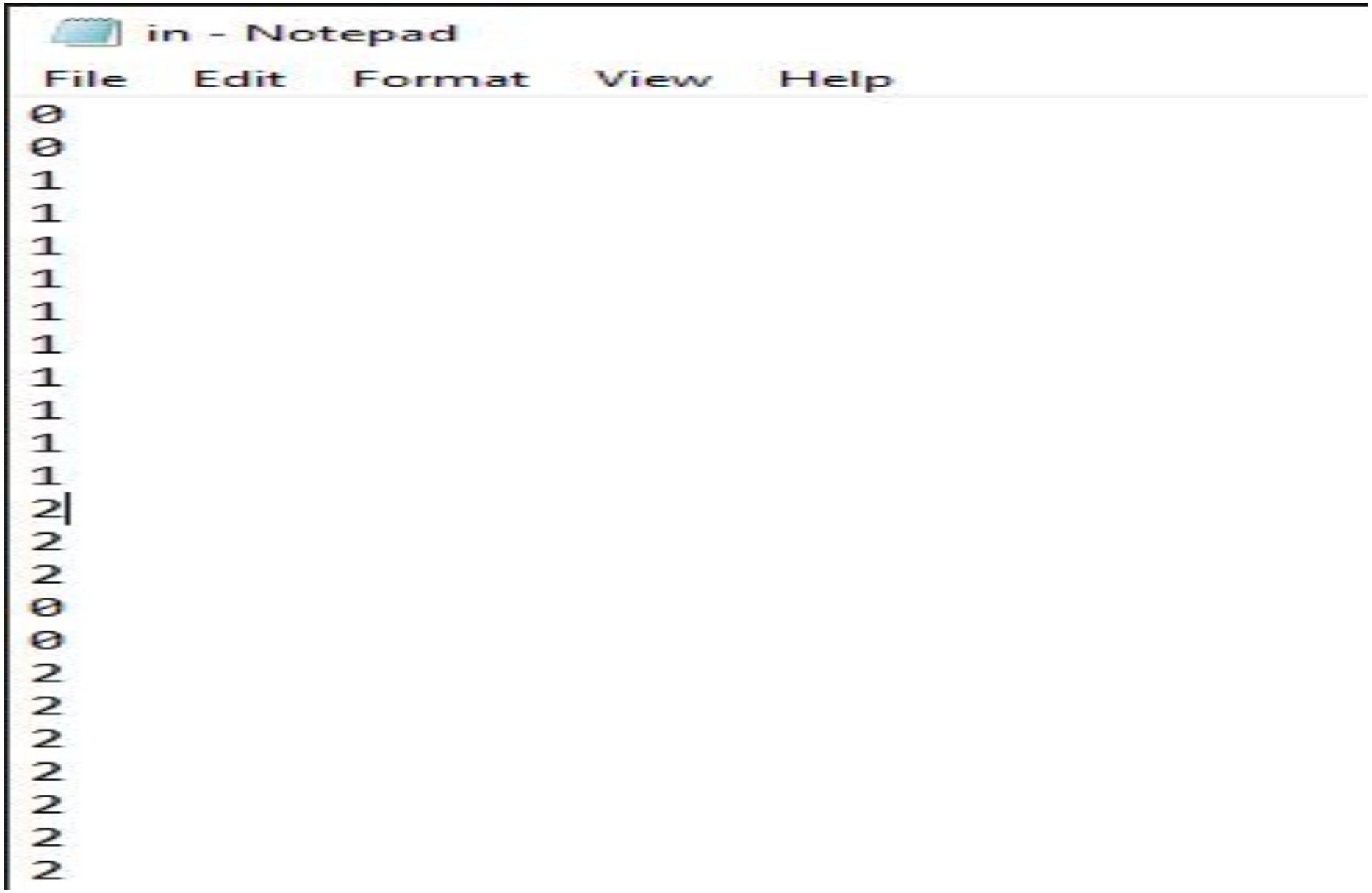
Demo - Screenshot 2



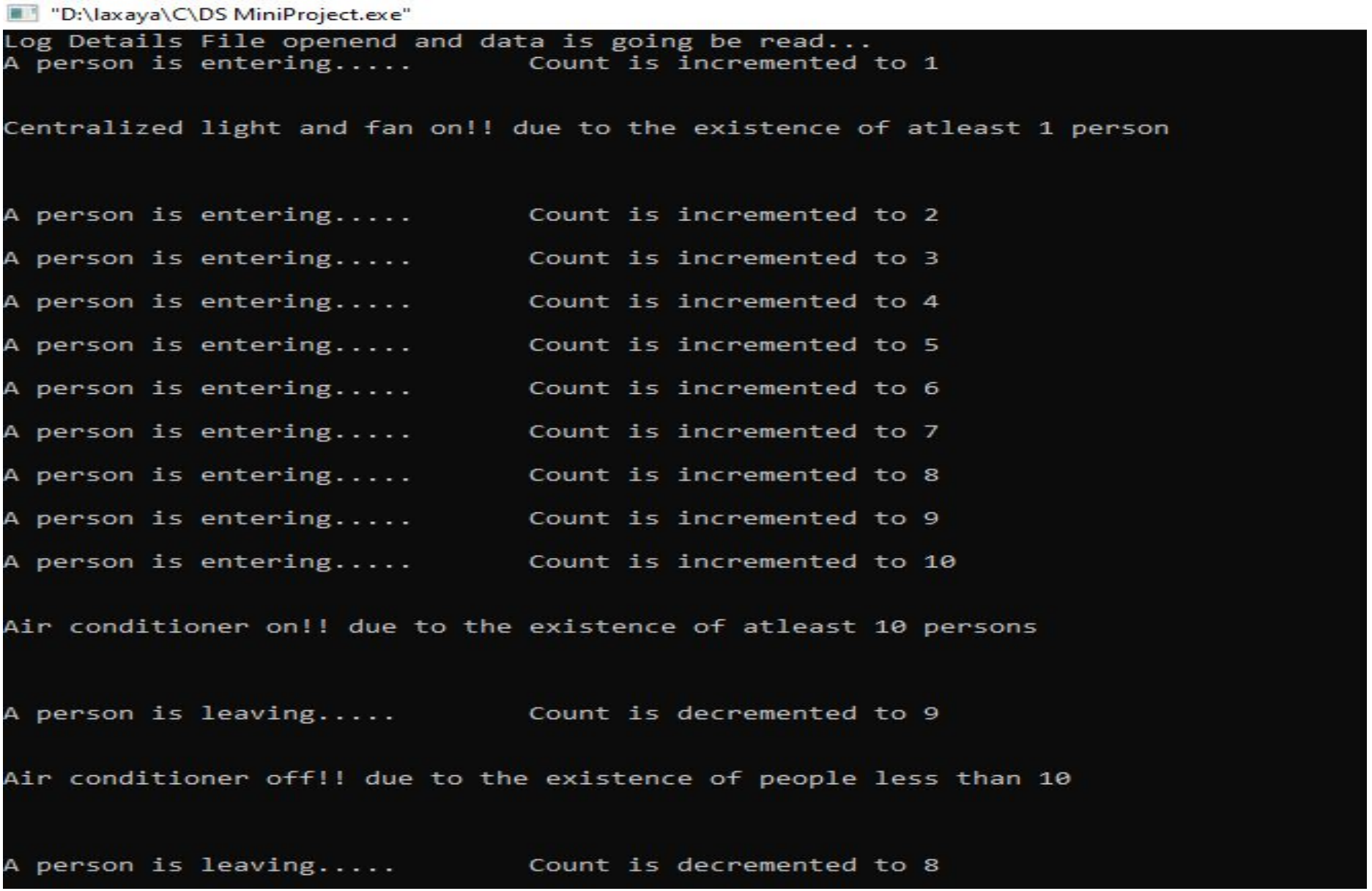
Demo - Screenshot 2

```
Log Details File openend and data is going be read...
A person is entering.....       Count is incremented to 1

Centralized light and fan on!! due to the existence of atleast 1 person


A person is entering.....       Count is incremented to 2

A person is entering.....       Count is incremented to 3

A person is entering.....       Count is incremented to 4

A person is entering.....       Count is incremented to 5

A person is entering.....       Count is incremented to 6

A person is entering.....       Count is incremented to 7

A person is leaving.....        Count is decremented to 6

A person is leaving.....        Count is decremented to 5

A person is leaving.....        Count is decremented to 4

A person is leaving.....        Count is decremented to 3

A person is leaving.....        Count is decremented to 2

A person is entering.....       Count is incremented to 3

A person is leaving.....        Count is decremented to 2

A person is leaving.....        Count is decremented to 1

A person is leaving.....        Count is decremented to 0

Centralized lights off!! due to the non-existence of people

The persons in the room is (The status of the stack is) :
Process returned 0 (0x0)   execution time : 0.328 s
```

Demo - Screenshot 3



Demo - Screenshot 3



Demo - Screenshot 3

```
Air conditioner off!! due to the existence of people less than 10


A person is leaving.....        Count is decremented to 8

A person is leaving.....        Count is decremented to 7

A person is leaving.....        Count is decremented to 6

A person is leaving.....        Count is decremented to 5

A person is leaving.....        Count is decremented to 4

A person is leaving.....        Count is decremented to 3

A person is leaving.....        Count is decremented to 2

A person is leaving.....        Count is decremented to 1

A person is leaving.....        Count is decremented to 0


Centralized lights off!! due to the non-existence of people


The persons in the room is (The status of the stack is) :
Process returned 0 (0x0)   execution time : 0.516 s
Press any key to continue.
```

Challenges

- Log maintenance using admin system
- System overload when the count reaches maximum threshold.
- System failure when there occurs improper maintenance of log count.

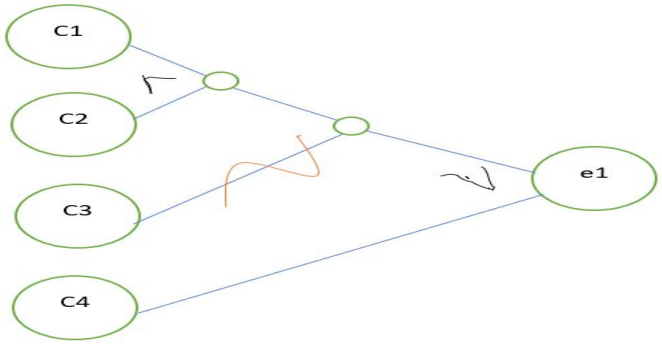
Test cases

Black box testing

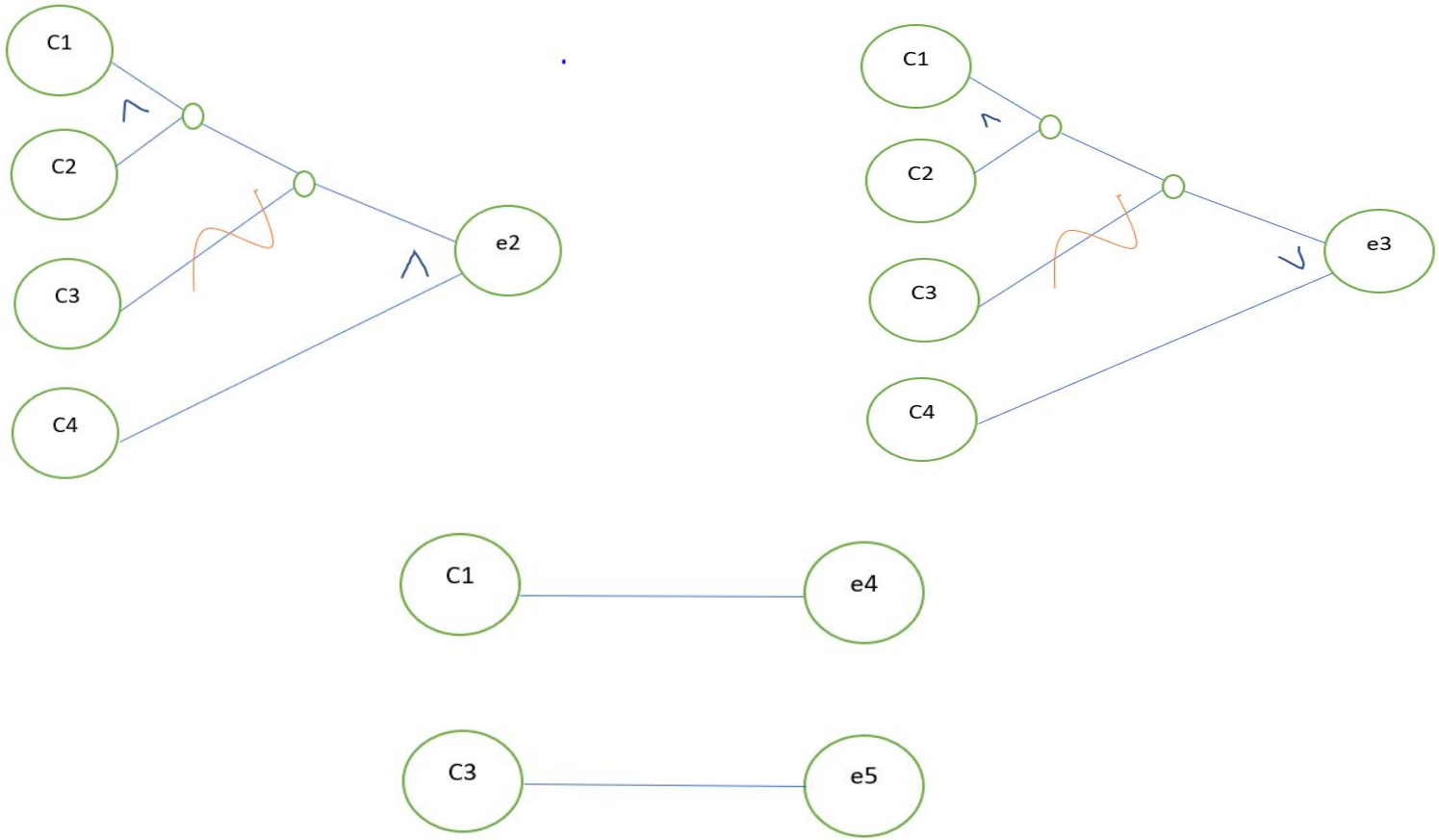
Cause and Effect graph

Causes	**effects**
C1 - Person enters	e1-Fan on
C2-Person seated	e2-Light on
C3-Person exited	e3-AC on
C4-Threshold achieved	e4-log increment
	E5-log decrement

Graph



Cause and Effects graph



Decision Table

Action	TC1	TC2	TC3	TC4	TC5	TC6
C1	1	1	1	1	0	0
C2	1	0	1	0	0	0
C3	0	0	0	0	1	0
C4	0	0	1	1	0	0
e1	1	0	1	0	0	0
e2	1	0	1	0	0	0
e3	0	0	1	1	0	0
e4	1	1	1	1	0	0
e5	**0**	**0**	**0**	**0**	**1**	**0**

Black Box Testing Test Cases

Test case number	Input values	System Behaviour
1	Person enters and get seated.	System accepts the input and switches on fan and light and increments log.
2	Person enters and does not get seated.	System accepts the input and increments log.
3	Person enters and gets seated and threshold achieved.	System accepts the input and switches on fan,light,AC and increments log.
4	Person enters and threshold achieved.	System accepts the input and switches on AC and increments log.
5	Person exits	Log decremented.
6	Person does nothing	System rejects.

White Box Testing Test cases

Test cases

Sys.overload( ) function

Test case number	Test cases	Expected output	Actual output	Status
1	top=19	1		
2	top=5	0		

Test Cases (Cont'd)

Sys.fail( ) function

Test case number	Test cases	Expected output	Actual output	Status
1	top=-1	1		
2	top=2	0		

Test Cases (Cont'd)

Main function

Test case number	Test cases	Expected output	Actual output	Status
1	fptr=NULL	print"Cannot open file"		Exit
2	fptr>1,<1,a to z , A to Z	Print "Log details file opened and data is going to be read"		
3	feof(fptr)-feof(3)	Print "The persons in the room is "count		
4	feof(fptr)-feof(0),feof(NULL)	x=ch		

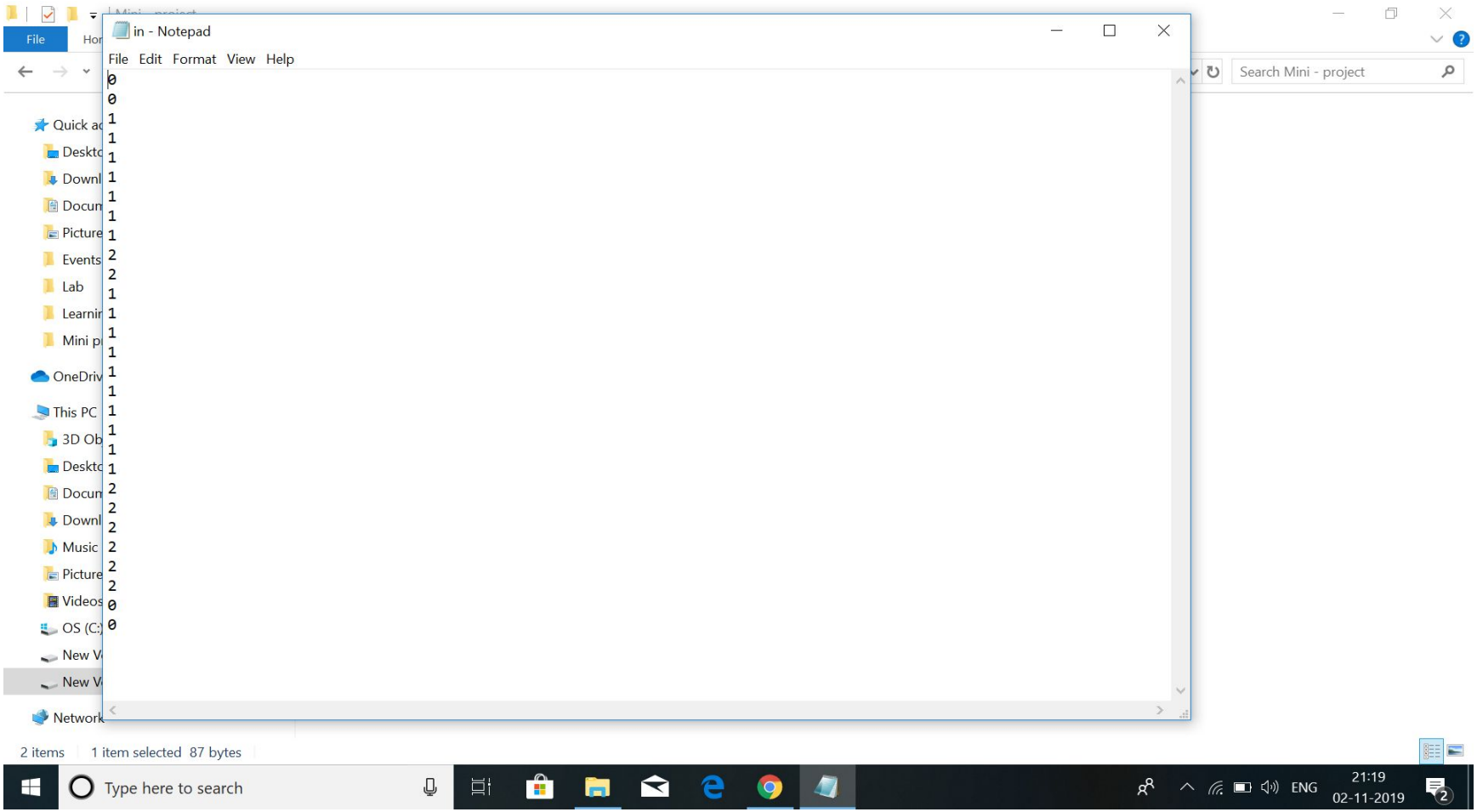
Test cases (Cont'd)

5	x=1 and !Sys.overload()	push(x) & count++		
6	x=1 and Sys.overload( )-True	Print "System overloaded" & count++,print count		
7	x=1,count=1	Print "Centralized fan and light on"		
8	x=1,count=10	Print "Air conditioner on",t=1		

Test cases (Cont'd)

9	x=2	Count decremented		
10	x=2,count=0	Centralized lights off		
11	x=2,count=5,t=1	Air conditioner in off state		
12	x=2,count=12,t=1	Air Conditioner exist in the same state		
13	x=2,count=5,t=0	Air Conditioner in off state		

File


in - Notepad
File Edit Format View Help
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Search Mini - project
2 items
1 item selected 87 bytes
Type here to search
ENG
21:19
02-11-2019

Evaluation Rubrics

Criteria	Exemplary (4)	Proficient (3)	Basic (2)	Needs improvement (1)
Problem understanding (2)	Societal relevant problem, understands thoroughly	Societal relevant problem, needs little more understanding	Needs to analyse the problem further	Selected the problem for the sake of doing
Application of OOP concept to the problem (5)	Concept is applied and it is very much suitable to the application	OO concept is applied and it is implemented	Concept is identified and partially implemented	Concept is identified but not implemented
Data structure design for the problem (5)	Concept is applied and it is very much suitable to the application	DS concept is applied and it is implemented	Concept is identified and partially implemented	Concept is identified but not implemented
Verification and validation (2)	Identified all defects and assigned its severity	Identified all major defects	Identified few defects	Needs understanding on review techniques
Modularity and task assignment (3)	Work is evenly distributed among team members based on skills	Work is distributed but skill set is not considered	Work distribution is done for the sake of doing	Work split not done
Documentation (2)	Used template and created formal report as per the specifications	Used template and created formal report	Created report without using template	Needs understanding in creating the reports
Presentation (2)	Communicates ideas through presentation and documents; is a sample for others	Communicates ideas through presentation and documents	Able to communicate orally; needs improvement in writing or vice versa	Not able to communicate properly
Involvement in the team (2)	Enthusiastic participation, inspiration for others	Participates in discussions; shares feelings and thoughts.	Listens mainly; make suggestions on some occasions	Seemed bored with conversations about the team; rarely speaks
Timeliness (1)	Completed assigned work ahead of time.	Completed assigned work on time.	Work was late but it does not have impact	Work was always late and has major impact

Thank You !!