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CSI 316: Report

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A DOCUMENTATION OF MY CSI 316 PROJECT REPORT TITLED:

“A Fire and Security Alarm Monitoring System”

JUNE 2021

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ABSTRACT

Security and safety is becoming a major concern in our world, due to the increased rates of robberies, vandalism and fire in many important places such as hospitals, homes, banks and many other business places. Since nothing can compensate for safety of the humans and because of the speed and totality of the destructive forces of fire, humans have decided to invest in their security and ensure a safe environment.

The first step toward halting such incidents is to properly identify the incident, raise the occupant alarm, and then alert either a central manned control area or unmanned who may pass these on to the emergency services or may respond personally. This is often the function of the fire and security alarm monitoring system.

This system enables the detection of the incidents such as security breaches and fire at its initial stage through the use of sensing devices and following a certain protocol. Thus by detecting the fire at its initial stage, the sensing devices provide people those precious minutes to evacuate the buildings in safety. Including the wireless communication in these systems will ensure safety of life and property. They may also provide enhanced flexibility of building design and increase the overall level of fire safety.

CHAPTER ONE INTRODUCTION (CASE DESCRIPTION)

1. BACKGROUND OF THE STUDY

This system is designed to detect fire and unauthorized entry into a building. Residential, commercial, industrial, and military properties use security and fire alarm systems for protection against property damage and theft. This system is a combination of both fire and security alarm which will provide both fire and intrusion protection.

The system directly alters either a manned or unmanned control area where proper actions can be taken. First, the alarm system is linked to surveillance systems that will automatically record the activities of intruders into a database and may access a control system to electrically lock doors. Second, the system will directly trigger the sprinklers to function after it detects fire. For the sprinkler system to work, there should be no people inside the room where the fire occurred and electrical equipment's should be turned off.

Third, after the system detects the fire, it should also activate a buzzer and the direction indicators should illuminate to allow the people to know the nearest fire exit.

Since technology is evolving, smart alarms have been manufactured to compensate the first early responses to fires that work manually by a watchman who used hand bell ringers or church bells.

The project revolves on the idea of implementing safety and security using alarm systems that is connected to a database focusing on mitigating the threats that are in the market nowadays. This alarm monitoring system manages data from different sources such as sensing devices either from a manned or unmanned central area. It will process the events and handle different situations. It predicts all situations and classifies each according to its severity and can act in advance. Installing such systems and its corresponding sensors in commercial buildings like offices, movie theatres, shopping malls and other public places is a necessity.

2. SYSTEM DESCRIPTION

Dealing with false alarms is extremely important and to minimize the issue, the fire and security alarm monitoring system will be linked to a database and designed to facilitate accurate identification of the source of heat smoke fire, and security breaches in their early stages to minimize occurrences of false alarms due to faulty equipment or system faults etc. The fire alarm control area will make final decision on whether a fire or fault exists by comparing the plotted patterns from a fire sensor against known fire and fault patterns held in its memory.

Since all the monitoring system operates on the same principle, thus if a fire is being reported from the sensing devices, alarm should alert the emergency services directly. If a detector detects smoke or heat, or someone operates a break glass unit, then audible signal should sound to warn others in the building that there may be a fire and to evacuate and this signal should also sound on all other floors and zones. It will also signal to all the elevator machine rooms indicating fire. And directions indicators will illuminate indicating the emergency exits.

3. TYPE OF SENSING DEVICES

In the case of manned control area center, humans can be an excellent fire detector. The person monitoring the surveillance cameras is able to see the fire and he's able to sense multiple aspects of fire including the heat, flames smoke and odors if he's physically present. Unfortunately, this is unreliable detection method if this person is not present when a fire starts so, automatic fire detectors have been developed to imitate the human senses of touch smell and sight. Smoke detectors can play a huge role in identifying fire while in its early flame stages replicating human senses of smell. The key advantage of such detectors is the ability to identify fire while it's still in its incipient then it can alert the emergency services to respond before severe damage occurs.

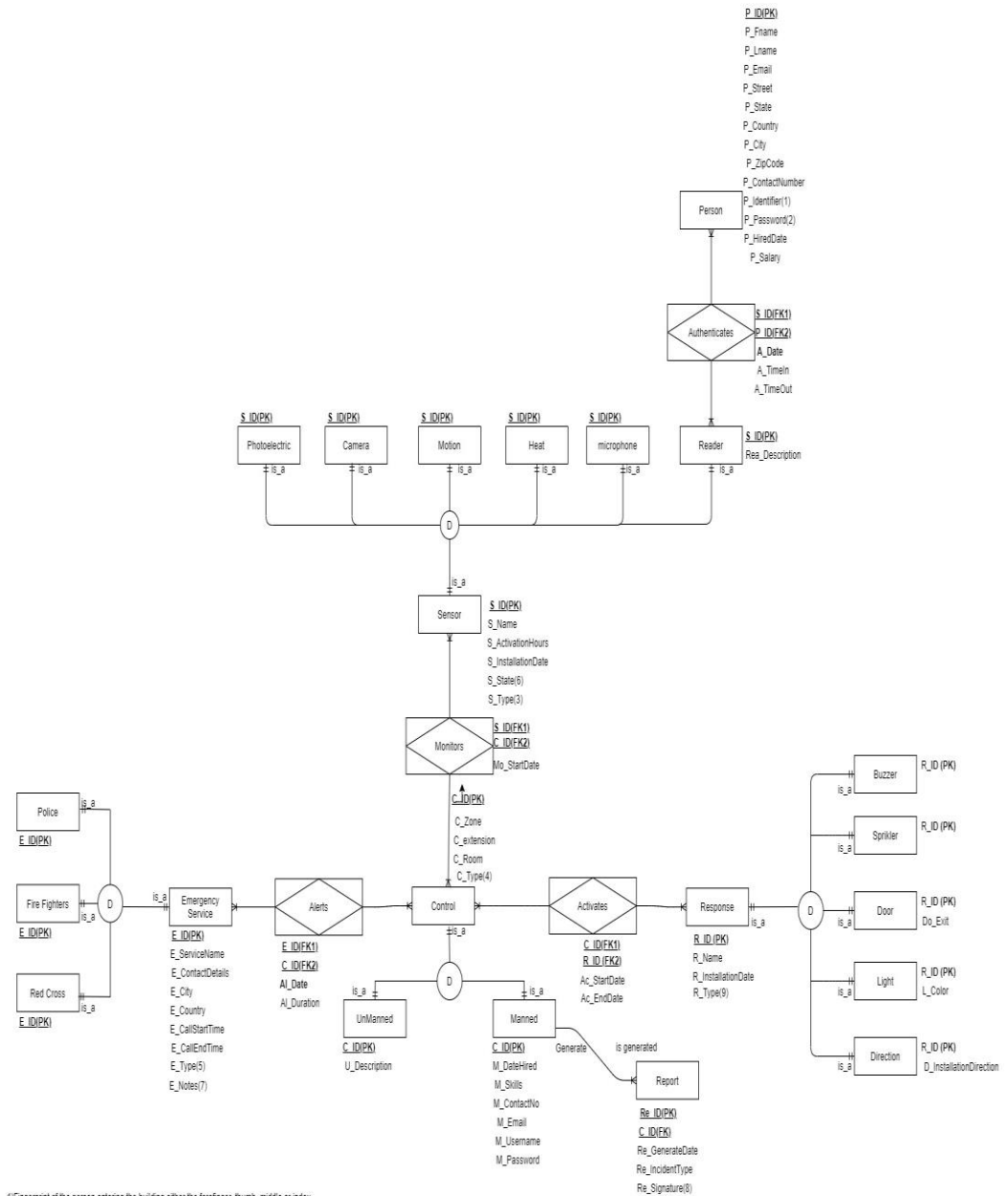
Moreover, sprinkler systems proved to be a great extinguishing agent where it utilizes water that cause the direct cooling of combustion process and prevents ignition of adjacent combustibles. It has a lot of benefits from immediate alert, identification and control of developing fire. It will enhance the life safety and reduce heat and smoke damage. However, motion, photoelectric sensors and microphone proved to be very reliable in a security system where it can trigger an alarm turn on lights or sends an alert. Motion sensors are highly sensitive to motion where it detects an object in motion, photoelectric sensors as well can be found is specific zones that contains a space where human and object may not enter. There exists as well the reader where a certain person can authenticate himself using either fingerprint or his eyes. Lastly, microphones rely on the audio spectrum to trigger warning. For instance, these sensors can detect inaudible frequency the human ear can't hear like breaking a glass or trying to access a certain zone in the building thus it will trigger alerts and alarms and act accordingly.

4. AIMS/OBJECTIVES

The aim is to develop a system, that seeks to use various stages of security and safety measures carrying these objectives:

- Ensuring the safety of occupants in buildings and provisioning for their evacuation or refuge during a fire or other emergency.
- Alerting the fire department at the early stage of the fire directing them to the area of risk
- To reduce building damage; the building may be unoccupied for periods where equipment is still powered and the owner wishes to ensure that if anything goes wrong the fire department is called to the scene in a timely manner
- To reduce the amount of business lost.
- To provide a secure environment and minimize the risk of thefts and to the public who attend the buildings for undesired purposes.

DESIGN MODELS



1)Fingerprint of the person entering the building either the forefinger, thumb, middle or index.

2>Password of the person enabling him to authenticates himself

3)Type of sensor either camera or microphone or photoelectric or heat or a reader

4)Type of control area either manned or unmanned one at a time cant be both

5)Category of emergency services either police or firefighters or Red Cross

6) State of Sensor either activated or deactivated

7) Case description taking place inside the building and severity of it

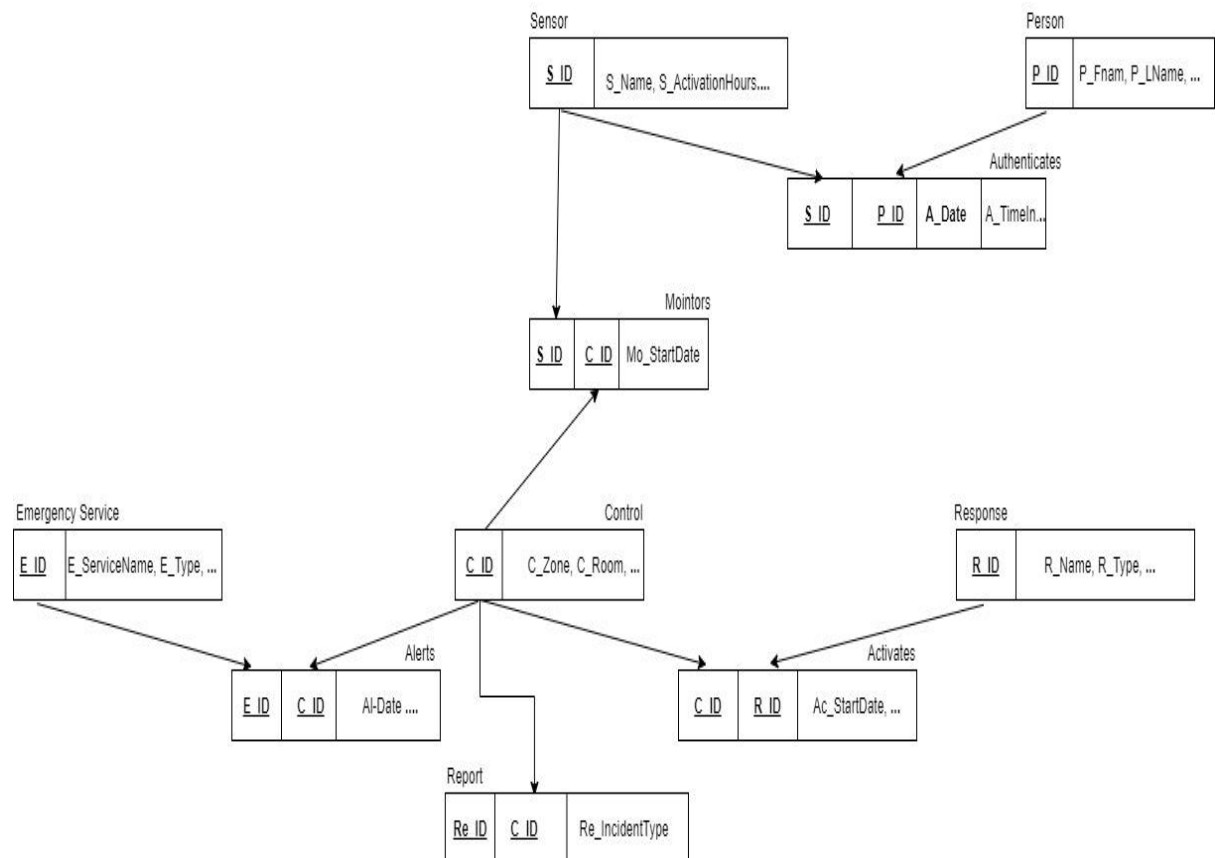
8) The name of the employee that signed the report

9) Type of response either the direction, light, Sprinkler, Door or buzzer

ASSUMPTIONS:

- Fingerprint of the person entering the building either the forefinger, thumb, middle or index.
- Password of the person enabling him to authenticates himself.
- Type of sensor either camera or microphone or photoelectric or heat or a reader.
- Type of control area either manned or unmanned one at a time can't be both.
- Category of emergency services either police or firefighters or Red Cross.
- State of Sensor either activated or deactivated.
- Case description taking place inside the building and severity of it.
- The name of the employee that signed the report.
- Type of response either the direction, light, Sprinkler, Door or buzzer.

LOGICAL SCHEMA



SQL QUERIES

create table Sensor

```
(  
    S_ID number(5,0),  
    S_name varchar2(30) not null,  
    S_ActivationHours number(5,0) not null,  
    S_InstallationDate DATE not null,  
    S_State varchar2(30) not null,  
    S_Type varchar2(1) not null,  
    Rea_Description varchar2(30),  
    CONSTRAINT Sensor_PK PRIMARY KEY (S_ID)  
);
```

```
drop table Sensor
```

Results Explain **Describe** Saved SQL History

Object Type **TABLE** Object **SENSOR**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
SENSOR	S_ID	NUMBER	-	5	0	1	-	-	-
	S_NAME	VARCHAR2	30	-	-	-	-	-	-
	S_ACTIVATIONHOURS	NUMBER	-	5	0	-	-	-	-
	S_INSTALLATIONDATE	DATE	7	-	-	-	-	-	-
	S_STATE	VARCHAR2	30	-	-	-	-	-	-
	S_TYPE	VARCHAR2	1	-	-	-	-	-	-
	REA_DESCRIPTION	VARCHAR2	30	-	-	-	✓	-	-
1 - 7									

create table Authenticates

```
(  
    S_ID number(5,0),  
    P_ID number(8,0),  
    A_Date DATE DEFAULT SYSDATE,  
    A_TimeIn DATE DEFAULT SYSDATE,  
    A_TimeOut DATE DEFAULT SYSDATE,
```

CONSTRAINT Authenticates_PK PRIMARY KEY (S_ID, P_ID),
CONSTRAINT Authenticates_FK1 FOREIGN KEY (S_ID) REFERENCES
Sensor(S_ID),
CONSTRAINT Authenticates_FK2 FOREIGN KEY (P_ID) REFERENCES
Person(P_ID));

Results Explain Describe Saved SQL History									
Object Type		TABLE Object AUTHENTICATES							
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUTHENTICATES	S_ID	NUMBER	-	5	0	1	-	-	-
	P_ID	NUMBER	-	8	0	2	-	-	-
	A_DATE	DATE	7	-	-	-	✓	SYSDATE	-
	A_TIMEIN	DATE	7	-	-	-	✓	SYSDATE	-
	A_TIMEOUT	DATE	7	-	-	-	✓	SYSDATE	-
									1 - 5
Workspace: SUITEDBA User: SUITEDBA									

create table Person

(
P_ID number(8) not null,
P_Fname varchar2(25) not null,
P_Lname varchar2(25) not null,
P_Street varchar2(25) not null,
P_City varchar2(25) not null,
P_Country varchar2(25) not null,
P_ZipCode varchar2(25),
P_HiredDate DATE DEFAULT SYSDATE,
P_ContactNumber number(15, 0) not null,
P_Password varchar2(25) not null,
P_Salary number(6, 0) not null,
P_Identifier BLOB not null,

CONSTRAINT Person_PK PRIMARY KEY (P_ID)

);

Results Explain Describe Saved SQL History									
Object Type TABLE Object PERSON									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PERSON	P_ID	NUMBER	-	8	0	1	-	-	-
	P_FNAME	VARCHAR2	25	-	-	-	-	-	-
	P_LNAME	VARCHAR2	25	-	-	-	-	-	-
	P_STREET	VARCHAR2	25	-	-	-	-	-	-
	P_CITY	VARCHAR2	25	-	-	-	-	-	-
	P_COUNTRY	VARCHAR2	25	-	-	-	-	-	-
	P_ZIPCODE	VARCHAR2	25	-	-	-	✓	-	-
	P_HIREDDATE	DATE	7	-	-	-	✓	SYSDATE	-
	P_CONTACTNUMBER	NUMBER	-	15	0	-	-	-	-
	P_IDENTIFIER	BLOB	4000	-	-	-	-	-	-
	P_PASSWORD	VARCHAR2	25	-	-	-	-	-	-
	P_SALARY	NUMBER	-	6	0	-	-	-	-

1 - 12

Workspace: SUITEDBA User: SUITEDBA

create table Control

(

C_ID number(5,0),
C_Zone varchar2(1) not null,
C_extension number(4,0) not null,
C_Room number(3,0) not null,
C_Type varchar2(1) not null,
U_Description varchar2(30),
M_DateHired DATE,
M_Skill varchar2(30),
M_ContactNo number(15,0),
M_Email varchar2(30),
M_Username varchar2(10),
M_Password varchar2(30),

CONSTRAINT Control_PK PRIMARY KEY (C_ID));

desc Control

Results Explain Describe Saved SQL History

Object Type TABLE Object CONTROL

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CONTROL	C_ID	NUMBER	-	5	0	1	-	-	-
	C_ZONE	VARCHAR2	1	-	-	-	-	-	-
	C_EXTENSION	NUMBER	-	4	0	-	-	-	-
	C_ROOM	NUMBER	-	3	0	-	-	-	-
	C_TYPE	VARCHAR2	1	-	-	-	-	-	-
	U_DESCRIPTION	VARCHAR2	30	-	-	-	✓	-	-
	M_DATEHIRED	DATE	7	-	-	-	✓	-	-
	M_SKILL	VARCHAR2	30	-	-	-	✓	-	-
	M_CONTACTNO	NUMBER	-	15	0	-	✓	-	-
	M_EMAIL	VARCHAR2	30	-	-	-	✓	-	-
	M_USERNAME	VARCHAR2	10	-	-	-	✓	-	-
	M_PASSWORD	VARCHAR2	30	-	-	-	✓	-	-

1 - 12

Workspace: SUITEDBA User: SUITEDBA

create table Monitors

(

S_ID number(5,0),

C_ID number(5,0),

Mo_StartDate DATE DEFAULT SYSDATE,

CONSTRAINT Monitors_PK PRIMARY KEY (S_ID,C_ID),

CONSTRAINT Monitors_FK1 FOREIGN KEY (S_ID)

REFERENCES Sensor(S_ID),

CONSTRAINT Monitors_FK2 FOREIGN KEY (C_ID)

REFERENCES Control(C_ID)

);

Object Type	TABLE	Object	MONITORS						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
MONITORS	S_ID	NUMBER	-	5	0	1	-	-	-
	C_ID	NUMBER	-	5	0	2	-	-	-
	MO_STARTDATE	DATE	7	-	-	-	✓	SYSDATE	-
1 - 3									

create table Response

(

R_ID number(5,0),

R_Name varchar2(30) not null,

R_InstallationDate DATE not null,

R_Type varchar2(2) not null,

Do_Exit varchar2(30),

L_Color varchar2(10),

D_InstallationDirection varchar2(10),

CONSTRAINT Response_PK PRIMARY KEY (R_ID)

);

Column Name	Data Type	Nullable	Default	Primary Key
R_ID	NUMBER(5,0)	No	-	1
R_NAME	VARCHAR2(30)	No	-	-
R_INSTALLATIONDATE	DATE	No	-	-
DO_EXIT	VARCHAR2(30)	Yes	-	-
L_COLOR	VARCHAR2(10)	Yes	-	-
D_INSTALLATIONDIRECTION	VARCHAR2(10)	Yes	-	-
R_TYPE	VARCHAR2(2)	No	-	-
1 - 7				

create table Activates

(

C_ID number(5,0),

R_ID number(5,0),

```

        Ac_StartDate DATE DEFAULT SYSDATE,
        Ac_EndDate DATE DEFAULT SYSDATE,

        CONSTRAINT Activates_PK PRIMARY KEY (C_ID,R_ID),
        CONSTRAINT Activates_FK1 FOREIGN KEY (C_ID)
REFERENCES Control(C_ID),
        CONSTRAINT Activates_FK2 FOREIGN KEY (R_ID)
REFERENCES Response(R_ID)
);

```

desc Activates

Results Explain Describe Saved SQL History

Object Type TABLE Object ACTIVATES

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ACTIVATES	C_ID	NUMBER	-	5	0	1	-	-	-
	R_ID	NUMBER	-	5	0	2	-	-	-
	AC_STARTDATE	DATE	7	-	-	-	✓	SYSDATE	-
	AC_ENDDATE	DATE	7	-	-	-	✓	SYSDATE	-

1 - 4

```

create table Emergency
(
    E_ID number(5) not null,
    E_ServiceName varchar2(25) not null,
    E_ContactDetails integer not null,
    E_City varchar2(25) not null,
    E_Country varchar2(25) not null,
    E_CallStartTime DATE not null,
    E_CallEndTime DATE not null,
    E_Type varchar(1) not null,
    E_Notes varchar2(250) not null,

```

CONSTRAINT Emergency_PK PRIMARY KEY (E_ID)

);

Results Explain Describe Saved SQL History									
Object Type TABLE Object EMERGENCY									
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMERGENCY	E_ID	NUMBER	-	5	0	1	-	-	-
	E_SERVICENAME	VARCHAR2	25	-	-	-	-	-	-
	E_CONTACTDETAILS	NUMBER	22	-	0	-	-	-	-
	E_CITY	VARCHAR2	25	-	-	-	-	-	-
	E_COUNTRY	VARCHAR2	25	-	-	-	-	-	-
	E_CALLSTARTTIME	DATE	7	-	-	-	-	-	-
	E_CALLENDTIME	DATE	7	-	-	-	-	-	-
	E_TYPE	VARCHAR2	1	-	-	-	-	-	-
	E_NOTES	VARCHAR2	250	-	-	-	-	-	-
									1 - 9

Workspace: SUITEDBA User: SUITEDBA

create table Alerts

(

E_ID number(5) not null,

C_ID number(5) not null,

Al_Date DATE DEFAULT SYSDATE,

Al_Duration number(38,0) not null,

CONSTRAINT Alerts_PK PRIMARY KEY (E_ID, C_ID),

CONSTRAINT Alerts_FK1 FOREIGN KEY (E_ID) REFERENCES

Emergency(E_ID),

CONSTRAINT Alerts_FK2 FOREIGN KEY (C_ID) REFERENCES

Control(C_ID)

);

Column Name	Data Type	Nullable	Default	Primary Key
E_ID	NUMBER(5,0)	No	-	1
C_ID	NUMBER(5,0)	No	-	2
AL_DATE	DATE	Yes	SYSDATE	-
AL_DURATION	NUMBER(38,0)	No	-	-

1 - 4

```
create table Report
```

(

Re_ID number(5) not null,

C_ID number(5) not null,

Re_GenerateDate DATE not null,

Re_IncidentType varchar2(50) not null,

Re_Signature varchar2(15) not null,

CONSTRAINT Report_PK PRIMARY KEY (Re_ID, C_ID),

CONSTRAINT Report_FK1 FOREIGN KEY (C_ID) REFERENCES

Control(C_ID)

);

desc

Report

Results

Explain

Describe

Saved SQL

History




Object Type **TABLE** Object **REPORT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
REPORT	RE_ID	NUMBER	-	5	0	1	-	-	-
	Q_ID	NUMBER	-	5	0	2	-	-	-
	RE_GENERATEDATE	DATE	7	-	-	-	-	-	-
	RE_INCIDENTTYPE	VARCHAR2	50	-	-	-	-	-	-
	RE_SIGNATURE	VARCHAR2	15	-	-	-	-	-	-

1 - 5

INSERT QUERIES:

```
INSERT INTO Sensor VALUES(84209, "Motion_3029", 16,
TO_DATE('12/03/2002','DD/MM/YYYY'), "Running", "M", "");
INSERT INTO Sensor VALUES(75752, "Heat_9090", 8,
TO_DATE('07/07/2002','DD/MM/YYYY'), "Stopped", "H", "");
INSERT INTO Sensor VALUES(48329, "read_5009", 12,
TO_DATE('01/06/2008','DD/MM/YYYY'), "Running", "R", "FingerPrint
reader");
```

EDIT	S_ID	S_NAME	S_ACTIVATIONHOURS	S_INSTALLATIONDATE	S_STATE	S_TYPE	REA_DESCRIPTION
	84209	Motion_3029	16	12/03/2002	Running	M	-
	75752	Heat_9090	8	07/07/2002	Stopped	H	-
	48329	read_5009	12	01/06/2008	Running	R	FingerPrint reader





row(s) 1 - 3 of 3

```
INSERT INTO Person VALUES (73190595, "David", "Holyfield", "2418",
"Arlington", "United States", "76001",
TO_DATE('02/01/2000','DD/MM/YYYY'), 8173179413, , "securePassword",
"4000", "ah" );
```

```
INSERT INTO Person VALUES (46834756, "Steven", "Peeples", "2564",
"Milton", "Canada", "K0E 0A0", TO_DATE('03/01/2001','DD/MM/YYYY'),
8679799923, , "P@ssw0rd", "3000", "ahdf" );
```

```
INSERT INTO Person VALUES (34897544, "Nicolas", "Fobbs", "514",
"Lindsay", "Canada", "K9V 4A4 ", TO_DATE('04/01/2000','DD/MM/YYYY'),
7053243701, , "MyPass", "2000", "afd");
```

```
INSERT INTO Person VALUES (32739250, "Louay", "khaddaj", "514",
"Lindsay", "Canada", "G0R 5R6 ", TO_DATE('03/01/2000','DD/MM/YYYY'),
8342394920, , "YEReRO", "2000", "dshj");
```




EDIT	P_ID	P_FNAME	P_LNAME	P_STREET	P_CITY	P_COUNTRY	P_ZIPCODE	P_HIREDDATE	P_CONTACTNUMBER	P_PASSWORD	P_SALARY	P_IDENTIFIER
	73190595	David	Holyfield	2418	Arlington	United States	76001	02/01/2000	8173179413	securePassword	4000	ah
	46834756	Steven	Peeples	2564	Milton	Canada	-	03/01/2001	8679799923	P@ssw0rd	3000	ahdf
	34897544	Nicolas	Fobbs	514	Lindsay	Canada	K9V 4A4	04/01/2000	7053243701	MyPass	2000	afd
	32739250	Louay	khaddaj	514	Lindsay	Canada	G0R 5R6	03/01/2000	8342394920	YEReRO	2000	dshj

row(s) 1 - 4 of 4

```

INSERT INTO Control (Control.C_ID, Control.C_Zone, Control.C_extension,
Control.C_Room, Control.C_Type, Control.M_DateHired, Control.M_Skill,
Control.M_ContactNo, Control.M_Email,Control.M_Username,
Control.M_Password) VALUES (10000, "A", 1001, 103, "M",
TO_DATE('02/01/2000','DD/MM/YYYY'), "Manager", 70856321,
manger@company.com, "manager", "password" );
INSERT INTO Control (Control.C_ID, Control.C_Zone, Control.C_extension,
Control.C_Room, Control.C_Type, Control.U_Description)VALUES (80000,
"C", 9000, 200, "U", "security analysis")
INSERT INTO Control (Control.C_ID, Control.C_Zone, Control.C_extension,
Control.C_Room, Control.C_Type, Control.M_DateHired, Control.M_Skill,
Control.M_ContactNo, Control.M_Email,Control.M_Username,
Control.M_Password) VALUES (38394, "B", 3004, 80, "M",
TO_DATE('06/02/2013','DD/MM/YYYY'), "accounting", 71293584,
accounting@company.com, "acc", "secure" );

```


EDIT	C_ID	C_ZONE	C_EXTENSION	C_ROOM	C_TYPE	U_DESCRIPTION	M_DATEHIRED	M_SKILL	M_CONTACTNO	M_EMAIL	M_USERNAME	M_PASSWORD
	10000	A	1001	103	M	-	02/01/2000	Manager	70856321	manger@company.com	manager	password
	38394	B	3004	80	M	-	06/02/2013	accounting	71293584	accounting@company.com	acc	secure
	80000	C	9000	200	U	security analysis	-	-	-	-	-	-

row(s) 1 - 3 of 3

```

INSERT INTO Monitors VALUES (84209, 10000, TO_DATE('05/03/2001','DD/MM/YYYY'));
INSERT INTO Monitors VALUES (75752, 80000, TO_DATE('13/07/2005','DD/MM/YYYY'));

```

EDIT	S_ID	C_ID	MO_STARTDATE
	84209	10000	05/03/2001
	75752	80000	12/07/2005




row(s) 1 - 2 of 2

```

INSERT INTO Emergency VALUES (10000, "Police", 71827440, "Los Angeles", "US",
TO_DATE('03/01/2001','DD/MM/YYYY'), TO_DATE('03/01/2001','DD/MM/YYYY'), "P",
"ROUTE13");
INSERT INTO Emergency VALUES (40000, "Fire Fighter", 70824910, "San Diego", "US",
TO_DATE('23/05/2005','DD/MM/YYYY'), TO_DATE('23/05/2005','DD/MM/YYYY'), "F",



```

```
"ROUTE14");
;INSERT INTO Emergency VALUES (70000, "Red Cross", 70294115, "Fort Worth", "US",
TO_DATE('21/04/2005','DD/MM/YYYY'), TO_DATE('21/04/2005','DD/MM/YYYY'), "R",
"ROUTE15");
```

EDIT	E_ID	E_SERVICENAME	E_CONTACTDETAILS	E_CITY	E_COUNTRY	E_CALLSTARTTIME	E_CALLENDTIME	E_TYPE	E_NOTES
	10000	Police	71827440	Los Angeles	US	03/01/2001	03/01/2001	P	ROUTE13
	40000	Fire Fighter	70824910	San Diego	US	12/05/2005	12/05/2005	F	ROUTE14
	70000	Red Cross	70294115	Fort Worth	US	11/04/2005	11/04/2005	R	ROUTE15




row(s) 1 - 3 of 3

```
INSERT INTO Alerts VALUES (70000, 10000, TO_DATE('18/03/2006','DD/MM/YYYY'),
60);
INSERT INTO Alerts VALUES (10000, 38394, TO_DATE('18/03/2006','DD/MM/YYYY'),
90);
```

EDIT	E_ID	C_ID	AL_DATE	AL_DURATION
	10000	38394	08/03/2006	90
	70000	10000	08/03/2006	60

row(s) 1 - 2 of 2

```
INSERT INTO Authenticates VALUES (48329, 32739250,
TO_DATE('15/02/2001','DD/MM/YYYY'));
INSERT INTO Authenticates VALUES (48329, 73190595,
TO_DATE('25/03/2002','DD/MM/YYYY'));
INSERT INTO Authenticates VALUES (34897544, 73190595);
```

EDIT	S_ID	P_ID	A_DATE	A_TIMEIN	A_TIMEOUT
	48329	32739250	05/02/2001	-	-
	48329	73190595	05/03/2002	-	-
	48329	34897544	-	-	-

row(s) 1 - 3 of 3

```
INSERT INTO Response VALUES (102309, "Door_Z01",
TO_DATE('12/07/2005','DD/MM/YYYY'), "First floor", "", "", "Do");
INSERT INTO Response VALUES (438728, "light_S20",
TO_DATE('1/07/2005','DD/MM/YYYY'), "", "Green", "L",);
```

EDIT	R_ID	R_NAME	R_INSTALLATIONDATE	DO_EXIT	L_COLOR	D_INSTALLATIONDIRECTION	R_TYPE
	10230	Door_Z01	12/07/2005	First Floor	-	-	Do
	43872	light_S20	01/07/2005	-	Green	-	L

row(s) 1 - 2 of 2

SELECT QUERIES:

Return the list of persons with the oldest hired date

```
SELECT Person.P_ID, Person.P_Fname, Person.P_Lname
FROM Person
ORDER BY Person.P_HiredDate ASC;
```

P_ID	P_FNAME	P_LNAME
73190595	David	Holyfield
32739250	Louay	khaddaj
34897544	Nicolas	Fobbs
46834756	Steven	Peeples

Return the person who has the highest Salary

```
SELECT Person.P_ID, Person.P_Fname, Person.P_Lname
FROM Person
WHERE Person.P_Salary = (SELECT MAX(Person.P_Salary) FROM Person);
```

P_ID	P_FNAME	P_LNAME
73190595	David	Holyfield

1 rows returned in 0.00 seconds [Download](#)

Return the list of responses with a name that starts with “B” and that were activated in 2000 by control in zone C order by installation date

```
SELECT Response.R_ID, Response.R_Name
FROM Response, Activates, Control
WHERE Response.R_Name = "B*" AND
```

(Activates.Ac_StartDate >= 01/01/200 AND Activates.Ac_StartDate <= 31/12/2000) AND
Control.C_Zone = "C" AND Response.R_ID = Activates.R_ID AND Control.C_ID =
Activates.C_ID
ORDER BY R_InstallationDate;

Return the list of persons who live at the same street as Nicolas and who live in canada and with the lowest salary

```
SELECT Person.P_ID, Person.P_Fname, Person.P_Lname
FROM Person
WHERE Person.P_Street = (SELECT Person.P_Street FROM Person WHERE Person.P_Fname
= "Nicolas") AND Person.P_Country = "Canada" AND Person.P_Salary = (SELECT
MIN(Person.P_Salary) FROM Person);
```

Find the list of sensors used by both David and Louay

```
SELECT Sensor.S_ID, Sensor.S_Name
FROM Person, Authenticates, Sensor
WHERE Person.P_Fname = "Louay" AND Sensor.S_ID = Authenticates.S_ID AND
Authenticates.P_ID = Person.P_ID;
INTERSECT
SELECT Sensor.S_ID, Sensor.S_Name
FROM Person, Authenticates, Sensor
WHERE Person.P_Fname = "David" AND Sensor.S_ID = Authenticates.S_ID AND
Authenticates.P_ID = Person.P_ID;
```

Return the total number of sensors monitoring zone C and return if it is less than the total number of sensors in zone A

```
SELECT COUNT(Monitors.S_ID), Control.C_ID
FROM Monitors, Control
WHERE Control.C_Zone = "C"
AND Control.C_ID = Monitors.C_ID
GROUP BY Control.C_Zone HAVING COUNT(Monitors.S_ID) < SELECT
COUNT(Monitors.S_ID)
FROM Monitors, Control WHERE Control.C_Zone = "A" AND Control.C_ID =
Monitors.C_ID;
```

Return for each person sensor used to authenticate in 2002

```
SELECT Person.P_ID, Person.P_Fname, Person.P_Lname
FROM Person, Authenticates, Sensor
WHERE (Authenticates.A_Date >= 01/01/2002 AND Authenticates.A_Date <= 31/12/2002)
AND Authenticates.S_ID = Sensor.S_ID AND Authenticates.P_ID = Person.P_ID;
```

Return the number of emergency services alerted in 2000 by the control in zone A if this number greater than 20

```
SELECT Count(Alerts.E_ID)
FROM Emergency, Alerts, Control
WHERE (Alerts.AI_Date >= 01/01/2000 Alerts.AI_Date <= 31/12/2000)
AND Control.C_Zone = "A" AND Alerts.E_ID = Emergency.E_ID AND Control.C_ID =
Alerts.E_ID
GROUP BY Alerts.E_ID HAVING COUNT(Alerts.E_ID) > 20;
```

The screenshot shows the Oracle Application Express interface. At the top, there's a navigation bar with 'Home', 'Application Builder', 'SQL Workshop', 'Team Development', and 'Administration'. Below this, a breadcrumb trail shows 'Home > SQL Workshop > SQL Commands'. The main area contains a text editor with the following SQL query:

```
SELECT Count(Alerts.E_ID)
FROM Emergency, Alerts, Control
WHERE (Alerts.AI_Date >= 01/01/2000 Alerts.AI_Date <= 31/12/2000)
AND Control.C_Zone = "A" AND Alerts.E_ID = Emergency.E_ID AND Control.C_ID = Alerts.E_ID
GROUP BY Alerts.E_ID HAVING COUNT(Alerts.E_ID) > 20;
```

Below the editor, there's a 'Results' tab and a red error icon with the message 'ORA-00907: missing right parenthesis'. The footer of the interface shows 'Workspace: SUITEDBA User: SUITEDBA' and 'Application Express 4.0.2.00.09'.

CONCLUSION AND FUTURE WORK

The project revolves mainly about the alarm and security monitoring system and can be divided into two different ways as their working principal, one that tackles the hardware and security part and the other that is related to our database and how we did implement it in our project. The security part mainly focuses on how we protect different zones of the buildings from intruders or bugler and on the other hand we could secure the house from any critical accident related to fires that could destroy the whole property. As for the database part which is the essence of our work, we can control the state of our detectors and sensors from setting the state of the device as activated or not. As well as the state of the devices that can take the action.

Moreover, the queries were written in an optimal form and this was done not to end up in a client server environment where we have different companies using the system and consider it slow and they will be unsatisfied.

The major requirements and functions of the system are not expected to differ significantly while security, simplicity and affordability will be on the top priority. Future services may contain friendliness requirement, low installation costs and device expenses requirements, quality of services requirements and interoperability requirement. More features such as system testing such as pen testing and maintenance can be integrated to the system as well. Pen testing is a process that involves an active analysis of the system for any potential vulnerabilities that may result from poor or improper system configuration and the best practice is to share with a third party advisors who may then contact the owner of the system for any further optimization.

Last but not least, the project offers clients with enormous benefits of simplicity, being compatible to situations where safety and security is ensured. By using such types of systems, safety will increase, the problem of business loss and property

damage will be eased and the security levels of the building will be increased. Not to forget the reliability where the smallest fires and breaches will be detected and the flexibility where it can be upgraded and changed upon the clients' request.

REFERENCES

[https://www.academia.edu/7481382/SMART HOME SECURITY SYSTEM](https://www.academia.edu/7481382/SMART_HOME_SECURITY_SYSTEM)

<https://www.nedcc.org/free-resources/preservation-leaflets/3.-emergency->

[management/3.2-an-introduction-to-fire-detection,-alarm,-and-automatic-fire-sprinklers](#)

<https://www.cedengineering.com/userfiles/Overview%20of%20Fire%20Alarm%20&%20Detection%20Systems.pdf>

Modern-Database-Management-Jeffrey-A.-Hoffer-V.-Ramesh-Heikki-Topi-Edisi-12-2016