

5.1 – Base para teste dos triggers de insert

```
drop table if exists Reading;
drop table if exists Setting;
drop table if exists Sensor;
drop table if exists Actuator;
drop table if exists Connects;
drop table if exists Device;
drop table if exists Lives;
drop table if exists Wears;
drop table if exists Patient;
drop table if exists PAN;
drop table if exists Municipality;
drop table if exists Period;
create table Patient(
    number varchar(40),
    name varchar(255),
    address varchar(255),
    primary key(number));
create table PAN(
    domain varchar(255),
    phone varchar(20),
    primary key(domain));
create table Device(
    serialnum integer,
    manufacturer varchar(255),
    description varchar(255),
    primary key(serialnum, manufacturer));
create table Sensor(
    snum integer,
    manuf varchar(255),
    units varchar(255),
```

```

        primary key(snum, manuf),
        foreign key(snum, manuf) references Device(serialnum, manufacturer));

create table Actuator(
    snum integer,
    manuf varchar(255),
    units varchar(255),
    primary key(snum, manuf),
    foreign key(snum, manuf) references Device(serialnum, manufacturer));

create table Municipality(
    nut4code integer,
    name varchar(255),
    primary key(nut4code));

create table Period(
    start date,
    end date,
    check(start < end),
    primary key(start, end));

create table Reading(
    snum integer,
    manuf varchar(255),
    datetime timestamp,
    value numeric(20,2),
    primary key(snum, manuf, datetime),
    foreign key(snum, manuf) references Sensor(snum, manuf));

create table Setting(
    snum integer,
    manuf varchar(255),
    datetime timestamp,
    value numeric(20,2),
    primary key(snum, manuf, datetime),
    foreign key(snum, manuf) references Actuator(snum, manuf));

```

```

create table Wears(
    start date,
    end date,
    patient varchar(255),
    pan varchar(255),
    check(start < end),
    primary key(start, end, patient),
    foreign key(start, end) references Period(start, end),
    foreign key(patient) references Patient(number),
    foreign key(pan) references PAN(domain));

create table Lives(
    start date,
    end date,
    patient varchar(255),
    muni integer,
    check(start < end),
    primary key(start, end, patient),
    foreign key(start, end) references Period(start, end),
    foreign key(patient) references Patient(number),
    foreign key(muni) references Municipality(nut4code));

create table Connects(
    start date,
    end date,
    snum integer,
    manuf varchar(255),
    pan varchar(255),
    check(start < end),
    primary key(start, end, snum, manuf),
    foreign key(start, end) references Period(start, end),
    foreign key(snum, manuf) references Device(serialnum, manufacturer),
    foreign key(pan) references PAN(domain));

```

insert into Patient values ('001-54245-1555555', 'Bernardo Gomes', 'Rua Alves Redol');
insert into Patient values ('001-54245-1555575', 'Diogo Martins', 'Avenida João Crisóstomo');
insert into Patient values ('001-54745-1555556', 'Diogo Proença', 'Avenida Praia da Vitória');
insert into Patient values ('001-54245-1855555', 'Zé Manel', 'Avenida Duque de Ávila');

insert into PAN values ('www.pan1.pt', '+351 91 000 00 00');
insert into PAN values ('www.pan2.pt', '+351 91 000 00 01');
insert into PAN values ('www.pan3.pt', '+351 91 000 00 02');
insert into PAN values ('www.pan4.pt', '+351 91 000 00 03');

insert into Device values (123456789, 'Philips', 'blood pressure');
insert into Device values (123456790, 'Philips', 'insuline meter');
insert into Device values (123456791, 'Philips', 'insuline meter');
insert into Device values (123456789, 'RPG', 'blood pressure');
insert into Device values (123456789, 'LG', 'scale');

insert into Actuator values (123456790, 'Philips', 'scale');
insert into Actuator values (123456791, 'Philips', 'insuline meter');

insert into Sensor values (123456789, 'RPG', 'blood pressure');
insert into Sensor values (123456789, 'Philips', 'blood pressure');
insert into Sensor values (123456790, 'Philips', 'insuline');

insert into Period values ('2011-10-09', '2012-12-01');
insert into Period values ('2013-11-25', '2013-12-01');
insert into Period values ('2014-12-25', '2015-01-01');
insert into Period values ('2015-04-01', '2015-10-25');
insert into Period values ('2015-10-26', '2015-11-26');

```
insert into Connects values ('2011-10-09', '2012-12-01', 123456789, 'Philips',  
'www.pan1.pt');
```

```
insert into Connects values ('2014-12-25', '2015-01-01', 123456790, 'Philips',  
'www.pan1.pt');
```

```
insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'Philips',  
'www.pan1.pt');
```

```
insert into Connects values ('2015-10-26', '2015-11-26', 123456789, 'Philips',  
'www.pan1.pt');
```

```
insert into Wears values ('2011-10-09', '2012-12-01', '001-54245-1555555',  
'www.pan1.pt');
```

```
insert into Wears values ('2014-12-25', '2015-01-01', '001-54245-1555555',  
'www.pan1.pt');
```

```
insert into Wears values ('2015-04-01', '2015-10-25', '001-54245-1555555',  
'www.pan1.pt');
```

```
insert into Wears values ('2015-10-26', '2015-11-26', '001-54245-1555555',  
'www.pan1.pt');
```

Ficheiros de teste insert

Connects:

source database_triggers_insert.sql

source trigger_pan_device_insert.sql

/*Inserir mesmo Device noutro PAN*/

/*Overlap Situação 1 new.start <= Connects.start e Connects.start <= new.end <= Connects.end*/

```
insert into Connects values ('2010-10-10', '2011-10-10', 123456789, 'Philips',  
'www.pan3.pt');
```

/*Overlap Situação 2 Connects.start <= new.start <= Connects.end e Connects.start <= new.end <= Connects.end*/

```
insert into Connects values ('2011-10-10', '2012-10-10', 123456789, 'Philips',  
'www.pan3.pt');
```

/*Overlap Situação 3 Connects.start <= new.start <= Connects.end e new.end >= Connects.end*/

```
insert into Connects values ('2011-10-10', '2013-10-10', 123456789, 'Philips',  
'www.pan3.pt');
```

```

/*Overlap Situação 4 new.start <= Connects.start e new.end >= Connects.end*/
insert into Connects values ('2010-10-10', '2013-10-10', 123456789, 'Philips',
'www.pan3.pt');

/*Sem Overlap Situação 5 new.start <= Connects.start e new.end <= Connects.start*/
insert into Connects values ('2009-10-10', '2010-10-10', 123456789, 'Philips',
'www.pan3.pt');

/*Sem Overlap Situação 6 new.start >= Connects.end e new.end >= Connects.end*/
insert into Connects values ('2016-10-10', '2017-10-10', 123456789, 'Philips',
'www.pan3.pt');

```

Wears:

source database_triggers_insert.sql
source trigger_pan_patient_insert.sql

```

/*Inserir novo Paciente no PAN de outro Paciente*/

/*Overlap Situação 1 new.start <= Connects.start e Connects.start <= new.end <=
Connects.end*/
insert into Wears values ('2010-10-10', '2011-10-10', '001-54245-1555575',
'www.pan1.pt');

/*Overlap Situação 2 Connects.start <= new.start <= Connects.end e Connects.start <=
new.end <= Connects.end*/
insert into Wears values ('2011-10-10', '2012-10-10', '001-54245-1555575',
'www.pan1.pt');

/*Overlap Situação 3 Connects.start <= new.start <= Connects.end e new.end >=
Connects.end*/
insert into Wears values ('2011-10-10', '2013-10-10', '001-54245-1555575',
'www.pan1.pt');

/*Overlap Situação 4 new.start <= Connects.start e new.end >= Connects.end*/
insert into Wears values ('2010-10-10', '2013-10-10', '001-54245-1555575',
'www.pan1.pt');

/*Sem Overlap Situação 5 new.start <= Connects.start e new.end <= Connects.start*/
insert into Wears values ('2009-10-10', '2010-10-10', '001-54245-1555575',
'www.pan1.pt');

/*Sem Overlap Situação 6 new.start >= Connects.end e new.end >= Connects.end*/

```

```
insert into Wears values ('2016-10-10', '2017-10-10', '001-54245-155555',  
'www.pan1.pt');
```

```
/*Inserir um Paciente noutra PAN quando este já está ligado a um PAN*/
```

```
/*Overlap Situação 1 new.start <= Connects.start e Connects.start <= new.end <=  
Connects.end*/
```

```
insert into Wears values ('2010-10-10', '2011-10-10', '001-54245-155555',  
'www.pan3.pt');
```

```
/*Overlap Situação 2 Connects.start <= new.start <= Connects.end e Connects.start <=  
new.end <= Connects.end*/
```

```
insert into Wears values ('2011-10-10', '2012-10-10', '001-54245-155555',  
'www.pan3.pt');
```

```
/*Overlap Situação 3 Connects.start <= new.start <= Connects.end e new.end >=  
Connects.end*/
```

```
insert into Wears values ('2011-10-10', '2013-10-10', '001-54245-155555',  
'www.pan3.pt');
```

```
/*Overlap Situação 4 new.start <= Connects.start e new.end >= Connects.end*/
```

```
insert into Wears values ('2010-10-10', '2013-10-10', '001-54245-155555',  
'www.pan3.pt');
```

```
/*Sem Overlap Situação 5 new.start <= Connects.start e new.end <= Connects.start*/
```

```
insert into Wears values ('2009-10-10', '2010-10-10', '001-54245-155555',  
'www.pan3.pt');
```

```
/*Sem Overlap Situação 6 new.start >= Connects.end e new.end >= Connects.end*/
```

```
insert into Wears values ('2016-10-10', '2017-10-10', '001-54245-155555',  
'www.pan3.pt');
```

5.2 – Base para teste dos triggers de update

```
drop table if exists Reading;
```

```
drop table if exists Setting;
```

```
drop table if exists Sensor;
```

```
drop table if exists Actuator;
```

```
drop table if exists Connects;
```

```
drop table if exists Device;
```

```
drop table if exists Lives;
```

drop table if exists Wears;
drop table if exists Patient;
drop table if exists PAN;
drop table if exists Municipality;
drop table if exists Period;

```
create table Patient(  
    number varchar(40),  
    name varchar(255),  
    address varchar(255),  
    primary key(number));
```

```
create table PAN(  
    domain varchar(255),  
    phone varchar(20),  
    primary key(domain));
```

```
create table Device(  
    serialnum integer,  
    manufacturer varchar(255),  
    description varchar(255),  
    primary key(serialnum, manufacturer));
```

```
create table Sensor(  
    snum integer,  
    manuf varchar(255),  
    units varchar(255),  
    primary key(snum, manuf),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Actuator(  
    primary key(serialnum, manuf),  
    foreign key(serialnum, manuf) references Device(serialnum, manufacturer));
```



```
snum integer,  
manuf varchar(255),  
units varchar(255),  
primary key(snum, manuf),  
foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Municipality(  
    nut4code integer,  
    name varchar(255),  
    primary key(nut4code));
```

```
create table Period(  
    start date,  
    end date,  
    check(start < end),  
    primary key(start, end));
```

```
create table Reading(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Sensor(snum, manuf));
```

```
create table Setting(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Actuator(snum, manuf));
```

```
create table Wears(  
    start date,  
    end date,  
    patient varchar(255),  
    pan varchar(255),  
    check(start < end),  
    primary key(start, end, patient),  
    foreign key(start, end) references Period(start, end),  
    foreign key(patient) references Patient(number),  
    foreign key(pan) references PAN(domain));
```

```
create table Lives(  
    start date,  
    end date,  
    patient varchar(255),  
    muni integer,  
    check(start < end),  
    primary key(start, end, patient),  
    foreign key(start, end) references Period(start, end),  
    foreign key(patient) references Patient(number),  
    foreign key(muni) references Municipality(nut4code));
```

```
create table Connects(  
    start date,  
    end date,  
    snum integer,  
    manuf varchar(255),  
    pan varchar(255),  
    check(start < end),  
    primary key(start, end, snum, manuf),  
    foreign key(start, end) references Period(start, end),
```

foreign key(snum, manuf) references Device(serialnum, manufacturer),
foreign key(pan) references PAN(domain));

insert into Patient values ('001-54245-1555555', 'Bernardo Gomes', 'Rua Alves Redol');

insert into Patient values ('001-54245-1555575', 'Diogo Martins', 'Avenida João
Crisóstomo');

insert into Patient values ('001-54745-1555556', 'Diogo Proença', 'Avenida Praia da
Vitória');

insert into Patient values ('001-54245-1855555', 'Zé Manel', 'Avenida Duque de Ávila');

insert into PAN values ('www.pan1.pt', '+351 91 000 00 00');

insert into PAN values ('www.pan2.pt', '+351 91 000 00 01');

insert into PAN values ('www.pan3.pt', '+351 91 000 00 02');

insert into PAN values ('www.pan4.pt', '+351 91 000 00 03');

insert into Device values (123456789, 'Philips', 'blood pressure');

insert into Device values (123456790, 'Philips', 'insuline meter');

insert into Device values (123456791, 'Philips', 'insuline meter');

insert into Device values (123456789, 'RPG', 'blood pressure');

insert into Device values (123456789, 'LG', 'scale');

insert into Actuator values (123456790, 'Philips', 'scale');

insert into Actuator values (123456791, 'Philips', 'insuline meter');

insert into Sensor values (123456789, 'RPG', 'blood pressure');

insert into Sensor values (123456789, 'Philips', 'blood pressure');

insert into Sensor values (123456790, 'Philips', 'insuline');

insert into Period values ('2011-10-09', '2012-12-01');

insert into Period values ('2013-11-25', '2013-12-01');

insert into Period values ('2014-12-25', '2015-01-01');

insert into Period values ('2015-04-01', '2015-10-25');

insert into Period values ('2015-10-26', '2015-11-26');

insert into Connects values ('2011-10-09', '2012-12-01', 123456789, 'Philips',
'www.pan1.pt');

insert into Connects values ('2013-11-25', '2013-12-01', 123456789, 'Philips',
'www.pan3.pt');

insert into Connects values ('2014-12-25', '2015-01-01', 123456790, 'Philips',
'www.pan1.pt');

insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'Philips',
'www.pan1.pt');

insert into Connects values ('2015-10-26', '2015-11-26', 123456789, 'Philips',
'www.pan1.pt');

insert into Wears values ('2011-10-09', '2012-12-01', '001-54245-1555555',
'www.pan1.pt');

insert into Wears values ('2013-11-25', '2013-12-01', '001-54245-1555575',
'www.pan1.pt');

insert into Wears values ('2014-12-25', '2015-01-01', '001-54245-1555555',
'www.pan3.pt');

insert into Wears values ('2015-04-01', '2015-10-25', '001-54245-1555555',
'www.pan1.pt');

insert into Wears values ('2015-10-26', '2015-11-26', '001-54245-1555555',
'www.pan1.pt');

Ficheiros de teste update

Connects:

source database_triggers_update.sql

source trigger_pan_device_update.sql

/*Com overlap*/

/*Aumentar new.end com overlap*/

update Connects set start = '2013-11-25', end = '2015-12-02' where pan =
'www.pan3.pt';

/*Diminuir new.start com overlap*/

update Connects set start = '2012-10-25', end = '2013-12-01' where pan = 'www.pan3.pt';

/*Diminuir new.end e diminuir new.start com overlap*/

update Connects set start = '2011-11-24', end = '2013-11-20' where pan = 'www.pan3.pt';

/*Aumentar new.end e diminuir new.start com overlap*/

update Connects set start = '2011-11-24', end = '2015-12-02' where pan = 'www.pan3.pt';

/*Aumentar new.start e aumentar new.start com overlap*/

update Connects set start = '2013-11-26', end = '2015-12-02' where pan = 'www.pan3.pt';

/*Sem overlap*/

/*Diminuir new.end sem overlap*/

update Connects set start = '2013-11-25', end = '2013-11-28' where pan = 'www.pan3.pt';

/*Aumentar new.end sem overlap*/

update Connects set start = '2013-11-25', end = '2013-12-02' where pan = 'www.pan3.pt';

/*Diminuir new.start sem overlap*/

update Connects set start = '2013-10-25', end = '2013-12-01' where pan = 'www.pan3.pt';

/*Aumentar new.start sem overlap*/

update Connects set start = '2013-11-26', end = '2013-12-01' where pan = 'www.pan3.pt';

/*Diminuir new.end e diminuir new.start sem overlap*/

update Connects set start = '2013-11-24', end = '2013-11-20' where pan = 'www.pan3.pt';

/*Diminuir new.end e aumentar new.start sem overlap*/

update Connects set start = '2013-11-26', end = '2013-11-30' where pan = 'www.pan3.pt';

/*Aumentar new.end e diminuir new.start sem overlap*/

update Connects set start = '2013-11-24', end = '2013-12-02' where pan = 'www.pan3.pt';

/*Aumentar new.end e aumentar new.start sem overlap*/

update Connects set start = '2013-11-26', end = '2013-12-02' where pan = 'www.pan3.pt';

Wears:

source database_triggers_update.sql

source trigger_pan_patient_update.sql

/*Situação em que novo Paciente veste um PAN já usado por outro Paciente*/

/*Com overlap*/

/* Aumentar new.end com overlap*/

update Wears set start = '2013-11-25', end = '2015-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.start com overlap*/

update Wears set start = '2012-10-25', end = '2013-12-01' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.end e diminuir new.start com overlap*/

update Wears set start = '2011-11-24', end = '2013-11-20' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.end e diminuir new.start com overlap*/

update Wears set start = '2011-11-24', end = '2015-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.end e aumentar new.start com overlap*/

update Wears set start = '2013-11-26', end = '2015-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.end sem overlap*/

update Wears set start = '2013-11-25', end = '2013-11-28' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.end sem overlap*/

update Wears set start = '2013-11-25', end = '2013-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.start sem overlap*/

update Wears set start = '2013-10-25', end = '2013-12-01' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.start sem overlap*/

update Wears set start = '2013-11-26', end = '2013-12-01' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.end e diminuir new.start sem overlap*/

update Wears set start = '2013-11-24', end = '2013-11-20' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Diminuir new.end e aumentar new.start sem overlap*/

update Wears set start = '2013-11-26', end = '2013-11-30' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.end e diminuir new.start sem overlap*/

update Wears set start = '2013-11-24', end = '2013-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/* Aumentar new.end e aumentar new.start sem overlap*/

update Wears set start = '2013-11-26', end = '2013-12-02' where patient = '001-54245-1555575' and pan = 'www.pan1.pt';

/*Situação em que o mesmo Paciente veste mais do que um PAN*/

/*Com overlap*/

/* Aumentar new.end com overlap*/

update Wears set start = '2013-11-25', end = '2015-12-02' where patient = '001-54245-1555555' and pan = 'www.pan3.pt';

/* Diminuir new.start com overlap*/

update Wears set start = '2012-10-25', end = '2013-12-01' where patient = '001-54245-1555555' and pan = 'www.pan3.pt';

/* Diminuir new.end e diminuir new.start com overlap*/

update Wears set start = '2011-11-24', end = '2013-11-20' where patient = '001-54245-1555555' and pan = 'www.pan3.pt';

/* Aumentar new.end e diminuir new.start com overlap*/

update Wears set start = '2011-11-24', end = '2015-12-02' where patient = '001-54245-1555555' and pan = 'www.pan3.pt';

/* Aumentar new.end e aumentar new.start com overlap*/

update Wears set start = '2013-11-26', end = '2015-12-02' where patient = '001-54245-1555555' and pan = 'www.pan3.pt';

```

/* Diminuir new.end sem overlap*/
update Wears set start = '2013-11-25', end = '2013-11-28' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Aumentar new.end sem overlap*/
update Wears set start = '2013-11-25', end = '2013-12-02' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Diminuir new.start sem overlap*/
update Wears set start = '2013-10-25', end = '2013-12-01' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Aumentar new.start sem overlap*/
update Wears set start = '2013-11-26', end = '2013-12-01' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Diminuir new.end e diminuir new.start sem overlap*/
update Wears set start = '2013-11-24', end = '2013-11-20' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Diminuir new.end e aumentar new.start sem overlap*/
update Wears set start = '2013-11-26', end = '2013-11-30' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Aumentar new.end e diminuir new.start sem overlap*/
update Wears set start = '2013-11-24', end = '2013-12-02' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

/* Aumentar new.end e aumentar new.start sem overlap*/
update Wears set start = '2013-11-26', end = '2013-12-02' where patient ='001-54245-155555' and pan = 'www.pan3.pt';

```

5.3 – Base para teste das queries

3. a)

drop table if exists Reading;

drop table if exists Setting;

drop table if exists Sensor;

drop table if exists Actuator;

drop table if exists Connects;

drop table if exists Device;

drop table if exists Lives;

drop table if exists Wears;

drop table if exists Patient;

drop table if exists PAN;

drop table if exists Municipality;

drop table if exists Period;

```
reate table Patient(  
    number varchar(40),  
    name varchar(255),  
    address varchar(255),  
    primary key(number));
```

```
create table PAN(  
    domain varchar(255),  
    phone varchar(20),  
    primary key(domain));
```

```
create table Device(  
    serialnum integer,  
    manufacturer varchar(255),  
    description varchar(255),  
    primary key(serialnum, manufacturer));
```

```
create table Sensor(  
    snum integer,  
    manuf varchar(255),  
    units varchar(255),  
    primary key(snum, manuf),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Actuator(  
    snum integer,  
    manuf varchar(255),
```

```
units varchar(255),  
primary key(snum, manuf),  
foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Municipality(  
    nut4code integer,  
    name varchar(255),  
    primary key(nut4code));
```

```
create table Period(  
    start date,  
    end date,  
    check(start < end),  
    primary key(start, end));
```

```
create table Reading(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Sensor(snum, manuf));
```

```
create table Setting(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Actuator(snum, manuf));
```

```
create table Wears(  

```

```
start date,  
end date,  
patient varchar(255),  
pan varchar(255),  
check(start < end),  
primary key(start, end, patient),  
foreign key(start, end) references Period(start, end),  
foreign key(patient) references Patient(number),  
foreign key(pan) references PAN(domain));
```

```
create table Lives(  
start date,  
end date,  
patient varchar(255),  
muni integer,  
check(start < end),  
primary key(start, end, patient),  
foreign key(start, end) references Period(start, end),  
foreign key(patient) references Patient(number),  
foreign key(muni) references Municipality(nut4code));
```

```
create table Connects(  
start date,  
end date,  
snum integer,  
manuf varchar(255),  
pan varchar(255),  
check(start < end),  
primary key(start, end, snum, manuf),  
foreign key(start, end) references Period(start, end),  
foreign key(snum, manuf) references Device(serialnum, manufacturer),  
foreign key(pan) references PAN(domain));
```

insert into Patient values ('001-54245-1555555', 'Bernardo Gomes', 'Rua Alves Redol');
insert into Patient values ('001-54245-1555575', 'Diogo Martins', 'Avenida João Crisóstomo');
insert into Patient values ('001-54745-1555556', 'Diogo Proença', 'Avenida Praia da Vitória');
insert into Patient values ('001-54245-1855555', 'Zé Manel', 'Avenida Duque de Ávila');

insert into PAN values ('www.pan1.pt', '+351 91 000 00 00');
insert into PAN values ('www.pan2.pt', '+351 91 000 00 01');
insert into PAN values ('www.pan3.pt', '+351 91 000 00 02');
insert into PAN values ('www.pan4.pt', '+351 91 000 00 03');

insert into Device values (123456789, 'RPG', 'blood pressure');
insert into Device values (123456789, 'Philips', 'blood pressure');
insert into Device values (123456789, 'Sony', 'blood pressure');
insert into Device values (123456789, 'LG', 'blood pressure');
insert into Device values (123456789, 'Samsung', 'blood pressure');
insert into Device values (123456789, 'Panasonic', 'blood pressure');
insert into Device values (123456790, 'Philips', 'insuline meter');
insert into Device values (123456791, 'Philips', 'insuline meter');

insert into Actuator values (123456790, 'Philips', 'scale');
insert into Actuator values (123456791, 'Philips', 'insuline meter');

insert into Sensor values (123456790, 'Philips', 'insuline');
insert into Sensor values (123456789, 'RPG', 'pascal');
insert into Sensor values (123456789, 'Philips', 'pascal');
insert into Sensor values (123456789, 'Sony', 'pascal');
insert into Sensor values (123456789, 'LG', 'pascal');
insert into Sensor values (123456789, 'Samsung', 'pascal');

insert into Sensor values (123456789, 'Panasonic', 'pascal');

insert into Period values ('2015-04-01', '2015-10-25');

insert into Period values ('2015-04-01', '2015-04-25');

insert into Period values ('2014-10-09', '2015-12-01');

insert into Period values ('2011-10-09', '2012-12-01');

insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'RPG',
'www.pan1.pt');

insert into Connects values ('2015-04-01', '2015-04-25', 123456789, 'Philips',
'www.pan1.pt');

insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'Sony',
'www.pan1.pt');

insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'LG',
'www.pan2.pt');

insert into Connects values ('2015-04-01', '2015-04-25', 123456789, 'Samsung',
'www.pan2.pt');

insert into Connects values ('2015-04-01', '2015-10-25', 123456789, 'Panasonic',
'www.pan2.pt');

insert into Wears values ('2014-10-09', '2015-12-01', '001-54245-1555555',
'www.pan1.pt');

insert into Wears values ('2011-10-09', '2012-12-01', '001-54245-1555555',
'www.pan2.pt');

insert into Reading values (123456789, 'RPG', '2015-10-24 09:45:00', 10);

insert into Reading values (123456789, 'Philips', '2015-10-24 09:45:00', 11);

insert into Reading values (123456789, 'Sony', '2015-01-24 09:45:00', 12);

insert into Reading values (123456789, 'LG', '2015-10-24 09:45:00', 13);

insert into Reading values (123456789, 'Samsung', '2015-10-24 09:45:00', 14);

insert into Reading values (123456789, 'Panasonic', '2015-01-24 09:45:00', 20);

3. b)

drop table if exists Reading;

drop table if exists Setting;
drop table if exists Sensor;
drop table if exists Actuator;
drop table if exists Connects;
drop table if exists Device;
drop table if exists Lives;
drop table if exists Wears;
drop table if exists Patient;
drop table if exists PAN;
drop table if exists Municipality;
drop table if exists Period;

create table Patient(
 number varchar(40),
 name varchar(255),
 address varchar(255),
 primary key(number));

create table PAN(
 domain varchar(255),
 phone varchar(20),
 primary key(domain));

create table Device(
 serialnum integer,
 manufacturer varchar(255),
 description varchar(255),
 primary key(serialnum, manufacturer));

create table Sensor(
 snum integer,
 manuf varchar(255),
 units varchar(255),

```
primary key(snum, manuf),  
foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Actuator(  
    snum integer,  
    manuf varchar(255),  
    units varchar(255),  
    primary key(snum, manuf),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Municipality(  
    nut4code integer,  
    name varchar(255),  
    primary key(nut4code));
```

```
create table Period(  
    start date,  
    end date,  
    check(start < end),  
    primary key(start, end));
```

```
create table Reading(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Sensor(snum, manuf));
```

```
create table Setting(  
    snum integer,  
    manuf varchar(255),
```

```
datetime timestamp,  
value numeric(20,2),  
primary key(snum, manuf, datetime),  
foreign key(snum, manuf) references Actuator(snum, manuf));
```

```
create table Wears(  
    start date,  
    end date,  
    patient varchar(255),  
    pan varchar(255),  
    check(start < end),  
    primary key(start, end, patient),  
    foreign key(start, end) references Period(start, end),  
    foreign key(patient) references Patient(number),  
    foreign key(pan) references PAN(domain));
```

```
create table Lives(  
    start date,  
    end date,  
    patient varchar(255),  
    muni integer,  
    check(start < end),  
    primary key(start, end, patient),  
    foreign key(start, end) references Period(start, end),  
    foreign key(patient) references Patient(number),  
    foreign key(muni) references Municipality(nut4code));
```

```
create table Connects(  
    start date,  
    end date,  
    snum integer,  
    manuf varchar(255),
```



```
pan varchar(255),
check(start < end),
primary key(start, end, snum, manuf),
foreign key(start, end) references Period(start, end),
foreign key(snum, manuf) references Device(serialnum, manufacturer),
foreign key(pan) references PAN(domain));
```

```
insert into Patient values ('001-54245-1555555', 'Bernardo Gomes', 'Rua Alves Redol');
```

```
insert into Patient values ('001-54245-1555575', 'Diogo Martins', 'Avenida João
Crisóstomo');
```

```
insert into Patient values ('001-54745-1555556', 'Diogo Proença', 'Avenida Praia da
Vitória');
```

```
insert into Patient values ('001-54245-1855555', 'Zé Manel', 'Avenida Duque de Ávila');
```

```
insert into PAN values ('www.pan1.pt', '+351 91 000 00 00');
```

```
insert into PAN values ('www.pan2.pt', '+351 91 000 00 01');
```

```
insert into PAN values ('www.pan3.pt', '+351 91 000 00 02');
```

```
insert into PAN values ('www.pan4.pt', '+351 91 000 00 03');
```

```
insert into Device values (123456789, 'Philips', 'blood pressure');
```

```
insert into Device values (123456790, 'Philips', 'insuline meter');
```

```
insert into Device values (123456791, 'Philips', 'heart rate');
```

```
insert into Device values (123456792, 'Philips', 'scale');
```

```
insert into Device values (123456793, 'Philips', 'temperature');
```

```
insert into Device values (123456794, 'Philips', 'respiratory rate');
```

```
insert into Device values (123456795, 'Philips', 'oxygen saturation');
```

```
insert into Device values (123456796, 'Philips', 'urea meter');
```

```
insert into Device values (123456797, 'Philips', 'lymphocytes rate');
```

```
insert into Period values ('2015-11-10', '2015-12-10'); /*Period Devices connects
PAN1,2,4*/
```

insert into Period values ('2015-10-10', '2015-11-30'); /*Period Devices Connects PAN3*/

insert into Period values ('2015-09-10', '2016-01-01'); /*Period Bernardo wears PAN1*/

insert into Period values ('2015-04-10', '2015-05-10'); /*Period Bernardo wears PAN2*/

insert into Period values ('2015-10-25', '2015-11-25'); /*Period Diogo wears PAN3*/

insert into Period values ('2015-11-15', '2015-11-25'); /*Period Proença wears PAN4*/

insert into Period values ('2015-10-10', '2016-10-10'); /*Period Bernardo and Diogo live in their Munis*/

insert into Period values ('2011-10-10', '2013-10-10'); /*Period Proença lives in his Muni*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456789, 'Philips', 'www.pan1.pt'); /*BP*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456790, 'Philips', 'www.pan1.pt'); /*IM*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456791, 'Philips', 'www.pan1.pt'); /*HR*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456792, 'Philips', 'www.pan2.pt'); /*Scale*/

insert into Connects values ('2015-10-10', '2015-11-30', 123456793, 'Philips', 'www.pan3.pt'); /*Temperature*/

insert into Connects values ('2015-10-10', '2015-11-30', 123456794, 'Philips', 'www.pan3.pt'); /*RR*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456795, 'Philips', 'www.pan4.pt'); /*OS*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456796, 'Philips', 'www.pan4.pt'); /*UM*/

insert into Connects values ('2015-11-10', '2015-12-10', 123456797, 'Philips', 'www.pan4.pt'); /*LR*/

insert into Wears values ('2015-09-10', '2016-01-01', '001-54245-1555555', 'www.pan1.pt'); /*Bernardo*/

insert into Wears values ('2015-04-10', '2015-05-10', '001-54245-1555555', 'www.pan2.pt'); /*Bernardo*/ /*Bernardo*/

insert into Wears values ('2015-10-25', '2015-11-25', '001-54245-1555575', 'www.pan3.pt'); /*Diogo*/

insert into Wears values ('2015-11-15', '2015-11-25', '001-54745-1555556', 'www.pan4.pt'); /*Proença*/

```
insert into Municipality values (2870, 'Montijo');
insert into Municipality values (2890, 'Alcochete');
insert into Municipality values (8125, 'Quarteira');
```

```
insert into Lives values ('2015-10-10', '2016-10-10', '001-54245-1555555', 8125);
insert into Lives values ('2015-10-10', '2016-10-10', '001-54245-1555575', 2890);
insert into Lives values ('2011-10-10', '2013-10-10', '001-54745-1555556', 2870);
```

3 c)

```
drop table if exists Reading;
drop table if exists Setting;
drop table if exists Sensor;
drop table if exists Actuator;
drop table if exists Connects;
drop table if exists Device;
drop table if exists Lives;
drop table if exists Wears;
drop table if exists Patient;
drop table if exists PAN;
drop table if exists Municipality;
drop table if exists Period;
```

```
create table Patient(
    number varchar(40),
    name varchar(255),
    address varchar(255),
    primary key(number));
```

```
create table PAN(
    domain varchar(255),
    phone varchar(20),
```

primary key(domain));

```
create table Device(  
    serialnum integer,  
    manufacturer varchar(255),  
    description varchar(255),  
    primary key(serialnum, manufacturer));
```

```
create table Sensor(  
    snum integer,  
    manuf varchar(255),  
    units varchar(255),  
    primary key(snum, manuf),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Actuator(  
    snum integer,  
    manuf varchar(255),  
    units varchar(255),  
    primary key(snum, manuf),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer));
```

```
create table Municipality(  
    nut4code integer,  
    name varchar(255),  
    primary key(nut4code));
```

```
create table Period(  
    start date,  
    end date,  
    check(start < end),  
    primary key(start, end));
```

```
create table Reading(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Sensor(snum, manuf));
```

```
create table Setting(  
    snum integer,  
    manuf varchar(255),  
    datetime timestamp,  
    value numeric(20,2),  
    primary key(snum, manuf, datetime),  
    foreign key(snum, manuf) references Actuator(snum, manuf));
```

```
create table Wears(  
    start date,  
    end date,  
    patient varchar(255),  
    pan varchar(255),  
    check(start < end),  
    primary key(start, end, patient),  
    foreign key(start, end) references Period(start, end),  
    foreign key(patient) references Patient(number),  
    foreign key(pan) references PAN(domain));
```

```
create table Lives(  
    start date,  
    end date,  
    patient varchar(255),
```

```
muni integer,  
check(start < end),  
primary key(start, end, patient),  
foreign key(start, end) references Period(start, end),  
foreign key(patient) references Patient(number),  
foreign key(muni) references Municipality(nut4code));
```

```
create table Connects(  
    start date,  
    end date,  
    snum integer,  
    manuf varchar(255),  
    pan varchar(255),  
    check(start < end),  
    primary key(start, end, snum, manuf),  
    foreign key(start, end) references Period(start, end),  
    foreign key(snum, manuf) references Device(serialnum, manufacturer),  
    foreign key(pan) references PAN(domain));
```

```
insert into Patient values ('001-54245-1555555', 'Bernardo Gomes', 'Rua Alves Redol');
```

```
insert into Patient values ('001-54245-1555575', 'Diogo Martins', 'Avenida João  
Crisóstomo');
```

```
insert into Patient values ('001-54745-1555556', 'Diogo Proença', 'Avenida Praia da  
Vitória');
```

```
insert into Patient values ('001-54245-1855555', 'Zé Manel', 'Avenida Duque de Ávila');
```

```
insert into PAN values ('www.pan1.pt', '+351 91 000 00 00');
```

```
insert into PAN values ('www.pan2.pt', '+351 91 000 00 01');
```

```
insert into PAN values ('www.pan3.pt', '+351 91 000 00 02');
```

```
insert into PAN values ('www.pan4.pt', '+351 91 000 00 03');
```

```
insert into PAN values ('www.pan5.pt', '+351 91 000 00 04');
```

insert into Device values (123456789, 'Philips', 'scale');
insert into Device values (123456790, 'RPG', 'scale');
insert into Device values (123456791, 'Panasonic', 'scale');
insert into Device values (123456792, 'LG', 'scale');
insert into Device values (123456793, 'Sony', 'scale');
insert into Device values (123456794, 'Samsung', 'scale');
insert into Device values (123456795, 'Siemens', 'scale');
insert into Device values (123456796, 'HP', 'scale');

insert into Period values ('2013-11-10', '2014-12-10');/*Connects Bernardo, Diogo e Proença bem*/
insert into Period values ('2015-11-10', '2015-12-10');/*Connects Bernardo Mal*/
insert into Period values ('2013-11-10', '2015-12-10');/*Connects Diogo com Wears Bem*/
insert into Period values ('2013-10-07', '2014-11-10');/*Wears Bernardo*/
insert into Period values ('2014-09-10', '2015-10-01');/*Wears Diogo Bem*/
insert into Period values ('2012-09-10', '2013-01-01');/*Wears Diogo Mal*/
insert into Period values ('2013-08-07', '2014-08-10');/*Wears Proença*/
insert into Period values ('2013-09-07', '2014-09-10');/*Wears Zé Manel*/
insert into Period values ('2014-10-10', '2014-12-10');/*Lives Bernardo*/
insert into Period values ('2014-09-10', '2014-10-10');/*Lives Diogo*/
insert into Period values ('2011-10-10', '2012-10-10');/*Lives Proença*/

insert into Connects values ('2013-11-10', '2014-12-10', 123456789, 'Philips', 'www.pan1.pt');
insert into Connects values ('2015-11-10', '2015-12-10', 123456790, 'RPG', 'www.pan1.pt');
insert into Connects values ('2013-11-10', '2015-12-10', 123456791, 'Panasonic', 'www.pan2.pt');
insert into Connects values ('2013-11-10', '2014-12-10', 123456792, 'LG', 'www.pan3.pt');
insert into Connects values ('2013-11-10', '2014-12-10', 123456793, 'Sony', 'www.pan4.pt');

insert into Connects values ('2013-11-10', '2014-12-10', 123456794, 'Samsung',
'www.pan4.pt');

insert into Connects values ('2013-11-10', '2014-12-10', 123456795, 'Siemens',
'www.pan5.pt');

insert into Connects values ('2013-11-10', '2014-12-10', 123456796, 'HP',
'www.pan5.pt');

insert into Wears values ('2013-10-07', '2014-11-10', '001-54245-1555555',
'www.pan1.pt');

insert into Wears values ('2014-09-10', '2015-10-01', '001-54245-1555575',
'www.pan2.pt');

insert into Wears values ('2012-09-10', '2013-01-01', '001-54245-1555575',
'www.pan3.pt');

insert into Wears values ('2013-08-07', '2014-08-10', '001-54745-1555556',
'www.pan4.pt');

insert into Wears values ('2013-09-07', '2014-09-10', '001-54245-1855555',
'www.pan5.pt');

insert into Municipality values (2870, 'Montijo');

insert into Municipality values (2890, 'Alcochete');

insert into Municipality values (8125, 'Quarteira');

insert into Lives values ('2014-10-10', '2014-12-10', '001-54245-1555555', 8125);

insert into Lives values ('2014-09-10', '2014-10-10', '001-54245-1555575', 2890);

insert into Lives values ('2011-10-10', '2012-10-10', '001-54745-1555556', 2870);

Ficheiros de teste

3. a)

source database3a.sql

source 3a.sql

call blood_pressure_prev6m_readings_patient('001-54245-1555555');

3. b)

source database3b.sql

source 3b.sql

3. c)

source database3c.sql

source 3c.sql

5.4 – Código PHP e HTML

index__.php

```
<?php session_start();
```

```
session_destroy();
```

```
?>
```

```
<html>
```

```
    <head><h2>Hi! Welcome to X Health Care Center Platform!</h2></head>
```

```
    <body>
```

```
        <hr/>
```

```
        <p>Please select the action you want to perform</p>
```

```
        <p></p>
```

```
        <ul>
```

```
            <li>Information check
```

```
                <ul>
```

```
                    <li><a href="Readings_Settings.html">Readings and Settings
```

```
of a patient</a></li>
```

```
                </ul>
```

```
            </li>
```

```
            <li>Database changes
```

```
                <ul>
```

```
                    <li><a href="Transfer_device.html">Transfer a device
```

```
to another PAN</a></li>
```

```
                </ul>
```

```
            </li>
```

```
        </ul>
```

```
</body>
```

```
</html>
```

Readings_Settings.html

```
<html>
```

```
<body>
```

```
<form action="Patient_intermediate.php" method="post">
```

```
<h3>Insert Patient name for Readings and Settings display</h3>
```

```
<p>Patient name: <input type="text" name="patient_name"/></p>
```

```
<p><input type="submit" value="Submit"/></p>
```

```
</form>
```

```
</body>
```

```
</html>
```

Patient_intermediate.php

```
<html>
```

```
<body>
```

```
<form action="Patient.php" method="post">
```

```
<?php
```

```
$patient_nam=$_REQUEST['patient_name'];
```

```
$host = "db.ist.utl.pt";
```

```
$user = "ist175573";
```

```
$pass = "swex6595";
```

```
$dsn = "mysql:host=$host;dbname=$user";
```

```
try
```

```
{
```

```
$connection = new PDO($dsn, $user, $pass);
```

```
}
```

```
catch(PDOException $exception)
```

```
{
```

```
echo("<p>Error: ");
```

```
echo($exception->getMessage());
```

```
echo("</p>");
```

```
exit();
```

```
}
```

```

        $sql = "SELECT number, name FROM Patient WHERE name like
'%$patient_nam%";

        $result = $connection->query($sql);

        if ($result == FALSE)
        {
            $info = $connection->errorInfo();
            echo("<p>Error: {$info[2]}</p>");
            exit();
        }

        $nrows= $result->rowCount();
        if($nrows!=0){

            echo("Select Patient:<br/>");

            echo("<table border=\"1\">");
            echo("<tr><td>number</td><td>name</td><td>is this
one?</td></tr>");
            foreach($result as $row)
            {
                echo("<tr><td>");
                echo($row['number']);
                echo("</td><td>");
                echo($row['name']);
                echo("</td><td>");
                $numb=$row['number'].' ';
                $numb.=$row['name'];
                echo("<input type=\"radio\" name=\"patient_name\"
value=\"\$numb\" />");
                echo("</td></tr>");
            }
            echo("</table>");

            echo("<p><input type=\"submit\" value=\"Submit\"/></p>");

```

```

        }else{
            echo("No patients with given characters... :(");
        }
    ?>

    <p></p>
    <p></p>
    <p></p>
    <a href="Readings_Settings.html">Go back</a>
    <p></p>
    <p><a href="index__.php">Back to main menu</a></p>
    </form>
</body>
</html>

```

Patient.php

```

<html>
    <body>
        <h3>Patient name successfully received!</h3>
        <p>Patient info given: <?php echo($_REQUEST['patient_name']); ?></p>
        <p>Patient info:</p>
    <?php
        $patient_nam=$_REQUEST['patient_name'];
        list($p_number, $p_name) = explode(" ", $patient_nam);
        $_SESSION['patient_name'] = $p_name;
        $_SESSION['patient_number']=$p_number;
        $host = "db.ist.utl.pt";
        $user = "ist175573";
        $pass = "swex6595";
        $dsn = "mysql:host=$host;dbname=$user";
        try
        {
            $connection = new PDO($dsn, $user, $pass);
        }
        catch(PDOException $exception)
        {

```

```

        echo("<p>Error: ");
        echo($exception->getMessage());
        echo("</p>");
        exit();
    }

    $sql = "SELECT number,name, address FROM Patient WHERE
number='$p_number'";

    $result = $connection->query($sql);

    if ($result == FALSE)
    {
        $info = $connection->errorInfo();
        echo("<p>Error: {$info[2]}</p>");
        exit();
    }

    echo("<table border='1'>");
    echo("<tr><td>number</td><td>name</td><td>address</td></tr>");
    foreach($result as $row)
    {
        echo("<tr><td>");
        echo($row['number']);
        echo("</td><td>");
        echo($row['name']);
        echo("</td><td>");
        echo($row['address']);
        echo("</td></tr>");
    }
    echo("</table>");

    $connection = null;

```

```
echo(" <p>Patient Readings:</p>");
```

```
try
{
    $connection = new PDO($dsn, $user, $pass);
}
catch(PDOException $exception)
{
    echo("<p>Error: ");
    echo($exception->getMessage());
    echo("</p>");
    exit();
}
```

```
$sql = "SELECT DISTINCT W.patient, C.snum, C.manuf, R.datetime, R.value,
S.units FROM Wears as W, Connects as C, Reading as R, Device as D, Sensor as S
```

```
WHERE(
(R.snum=C.snum AND R.manuf= C.manuf) AND
(R.datetime>=C.start AND R.datetime<=C.end)
AND
(R.datetime>=W.start AND R.datetime<=W.end)
AND
((R.snum=S.snum AND R.manuf= S.manuf))
AND
(C.pan= W.pan) AND (W.patient='$p_number')
)";
```

```
$result = $connection->query($sql);
```

```
if ($result == FALSE)
```

```
{
    $info = $connection->errorInfo();
```

```

        echo("<p>Error: {$info[2]}</p>");
        exit();
    }

    $nrows= $result->rowCount();
    if($nrows!=0){
        echo("<table border=\"1\">");
        echo("<tr><td>Patient</td><td> device serial number</td><td> device
manufacturer</td><td>time</td><td>value</td><td>units</td></tr>");
        foreach($result as $row)
        {
            echo("<tr><td>");
            echo($row['patient']);
            echo("</td><td>");
            echo($row['snum']);
            echo("</td><td>");
            echo($row['manuf']);
            echo("</td><td>");
            echo($row['datetime']);
            echo("</td><td>");
            echo($row['value']);
            echo("</td><td>");
            echo($row['units']);
            echo("</td></tr>");
        }
        echo("</table>");

    }else{
        echo("<p>Patient has no readings :(</p>");
    }
    $connection = null;

    echo(" <p>Patient Settings:</p>");

```

```

try
{
    $connection = new PDO($dsn, $user, $pass);
}
catch(PDOException $exception)
{
    echo("<p>Error: ");
    echo($exception->getMessage());
    echo("</p>");
    exit();
}

```

```

$sql = "SELECT DISTINCT W.patient, C.snum, C.manuf, S.datetime, S.value,
A.units FROM Wears as W, Connects as C, Setting as S, Device as D, Actuator as A

```

```

WHERE(
    (S.snum=C.snum AND S.manuf= C.manuf) AND
    (S.datetime>=C.start AND S.datetime<=C.end)
    AND
    (S.datetime>=W.start AND S.datetime<=W.end)
    AND
    ((S.snum=A.snum AND S.manuf= A.manuf))
    AND
    (C.pan= W.pan) AND (W.patient ='$p_number')
);

```

```

$result = $connection->query($sql);

```

```

if ($result == FALSE)
{
    $info = $connection->errorInfo();
    echo("<p>Error: {$info[2]}</p>");
    exit();
}

```



```

$rows= $result->rowCount();
if($rows!=0){

    echo("<table border=\"1\">");
    echo("<tr><td>Patient</td><td> device serial number</td><td> device
manufacturer</td><td>time</td><td>value</td><td>units</td></tr>");
    foreach($result as $row)
    {
        echo("<tr><td>");
        echo($row['patient']);
        echo("</td><td>");
        echo($row['snum']);
        echo("</td><td>");
        echo($row['manuf']);
        echo("</td><td>");
        echo($row['datetime']);
        echo("</td><td>");
        echo($row['value']);
        echo("</td><td>");
        echo($row['units']);
        echo("</td></tr>");
    }
    echo("</table>");
}else{
    echo("<p>Patient has no Settings :(</p>");
}
$connection = null;

```

?>

<p></p>

Go back

```
<p></p>
<p><a href="index__.php">Back to main menu</a></p>
</body>
```

```
</html>
```

Transfer_device.html

```
<html>
  <body>
    <form action="transfer_intermediate.php" method="post">
      <h3>Insert Patient name to view devices of his/hers PAN</h3>
      <p>Patient name: <input type="text" name="patient_name"/></p>
      <p><input type="submit" value="Submit"/></p>
    </form>
  </body>
</html>
```

transfer_intermediate.php

```
<html>
  <body>
    <form action="transfer.php" method="post">
<?php
    $patient_nam=$_REQUEST['patient_name'];
    $host = "db.ist.utl.pt";
    $user = "ist175573";
    $pass = "swex6595";
    $dsn = "mysql:host=$host;dbname=$user";

    try
    {
        $connection = new PDO($dsn, $user, $pass);
    }
    catch(PDOException $exception)
    {
        echo("<p>Error: ");
        echo($exception->getMessage());
        echo("</p>");
        exit();
    }
  </body>
</html>
```

```

    }

    $sql = "SELECT number, name FROM Patient WHERE name like
'%$patient_nam%'";

    $result = $connection->query($sql);

    if ($result == FALSE)
    {
        $info = $connection->errorInfo();
        echo("<p>Error: {$info[2]}</p>");
        exit();
    }

    $nrows= $result->rowCount();
    if($nrows!=0){

        echo("Select Patient:<br/>");

        echo("<table border='1'>");
        echo("<tr><td>number</td><td>name</td><td>is this
one?</td></tr>");

        foreach($result as $row)
        {
            echo("<tr><td>");
            echo($row['number']);
            echo("</td><td>");
            echo($row['name']);
            echo("</td><td>");
            $numb=$row['number'].' ';
            $numb.=$row['name'];
            echo("<input type='radio' name='patient_name\"
value='\"$numb\" />");

            echo("</td></tr>");

        }
        echo("</table>");
    }

```

```

        echo("<p><input type=\"submit\" value=\"Submit\"/></p>");
    }else{
        echo("No patients with given characters... :(");
    }
?>

<p></p>
<p></p>
<p></p>
<a href="Transfer_device.html">Go back</a>
<p></p>
<p><a href="index__.php">Back to main menu</a></p>
</form>
</body>
</html>
Transfer.php
<?php session_start(); ?>
<html>
    <body>
        <h3>Patient name successfully received!</h3>
        <p>Patient name given: <?php echo($_REQUEST['patient_name']); ?></p>

<?php
    $patient_nam=$_REQUEST['patient_name'];
    list($p_number, $p_name) = explode(" ", $patient_nam);
    $_SESSION['patient_name'] = $p_name;
    $_SESSION['patient_number']=$p_number;
    $host = "db.ist.utl.pt";
    $user = "ist175573";
    $pass = "swex6595";
    $dsn = "mysql:host=$host;dbname=$user";

    try
    {
        $connection = new PDO($dsn, $user, $pass);

```

```

    }
    catch(PDOException $exception)
    {
        echo("<p>Error: ");
        echo($exception->getMessage());
        echo("</p>");
        exit();
    }

    $sql = "SELECT P.number, P.name, W.pan, W.start, W.end FROM Patient as
P, Wears as W WHERE P.number='$p_number'

        AND W.patient=P.number";

    $result = $connection->query($sql);

    if ($result == FALSE)
    {
        $info = $connection->errorInfo();
        echo("<p>Error: {$info[2]}</p>");
        exit();
    }

    $nrows= $result->rowCount();
    if($nrows!=0){
        echo("Patient PAN's:<br/>");

        echo("<table border='1'>");

        echo("<tr><td>number</td><td>name</td><td>pan</td><td>start</td><td>end</td><
/tr>");

        foreach($result as $row)
        {
            echo("<tr><td>");
            echo($row['number']);
            echo("</td><td>");

```

```

        echo($row['name']);
        echo("</td><td>");
        echo($row['pan']);
        echo("</td><td>");
        echo($row['start']);
        echo("</td><td>");
        echo($row['end']);
        echo("</td></tr>");
    }
    echo("</table>");
} else {
    echo("Patient was never connected to a PAN :)");
}

```

```

echo("<p></p> <p></p>");
echo("Current PAN:");
echo("<br/>");

```

```

$sql = "SELECT P.number, P.name, W.pan, W.start, W.end FROM Patient as
P, Wears as W WHERE P.number='$p_number'

```

```

AND W.patient=P.number AND current_date<=W.end AND
current_date>=W.start";

```

```

$result = $connection->query($sql);

```

```

if ($result == FALSE)

```

```

{
    $info = $connection->errorInfo();
    echo("<p>Error: {$info[2]}</p>");
    exit();
}

```

```

$nrows= $result->rowCount();

```

```

if($nrows!=0){ /*the patient is using a PAN at the moment*/

    echo("<table border=\"1\">");

    echo("<tr><td>number</td><td>name</td><td>pan</td><td>start</td><td>end</td><
/tr>");

    foreach($result as $row)
    {
        echo("<tr><td>");
        echo($row['number']);
        echo("</td><td>");
        echo($row['name']);
        echo("</td><td>");
        echo($row['pan']);
        $_SESSION['current_pan']=$row['pan'];
        echo("</td><td>");
        echo($row['start']);
        echo("</td><td>");
        echo($row['end']);
        echo("</td></tr>");
    }
    echo("</table>");

}

else
{
    echo("<p>Patient has no PAN at the moment</p>");
}

echo("<p></p> <p></p>");
echo("Previous PAN:");
echo("<br/>");

```

```

        $sql = "SELECT P.number, P.name, W.pan, W.start, W.end FROM
Patient as P, Wears as W WHERE P.number='$p_number'

        AND W.patient=P.number AND W.end>=all(SELECT
W.end FROM Patient as P, Wears as W WHERE P.number='$p_number'

        AND W.patient=P.number AND W.end<current_date AND
W.end!='2999-12-31')

        AND W.end<current_date AND        W.end!='2999-
12-31'

        ";
$result = $connection->query($sql);

if ($result == FALSE)
{
    $info = $connection->errorInfo();
    echo("<p>Error: {"$info[2]}</p>");
    exit();
}

$nrows= $result->rowCount();
if($nrows!=0){
    echo("<table border='1'>");

    echo("<tr><td>number</td><td>name</td><td>pan</td><td>start</td><td>end</td><
/tr>");

    foreach($result as $row)
    {
        echo("<tr><td>");
        echo($row['number']);
        echo("</td><td>");
        echo($row['name']);
        echo("</td><td>");
        echo($row['pan']);
    }
}

```



```

        $_SESSION['previous_pan']=$row['pan'];
        echo("</td><td>");
        echo($row['start']);
        echo("</td><td>");
        echo($row['end']);
        echo("</td></tr>");
    }
    echo("</table>");

    }else{
        echo("<p>No Previous PAN's</p>");
    }
    $connection = null;

    if($nrows!=0)
    {
        echo("<p><a href=\"transfer_session2.php\">Keep visualizing resultes
</a></p>");
    }

?>

<p></p>
<p></p>
<p></p>
<a href="transfer_intermediate.php">Go back</a>
<p></p>
<p><a href="index__.php">Back to main menu</a></p>

</body>

</html>

Transfer_session2.php

<?php session_start(); ?>

<html>

    <body>

        <h3>Devices connected to the actual pan:<br/></h3>

```

```

        <form action='transfer_session3.php' method="post">

<?php
$patient_nam=$_SESSION['patient_name'];
$p_number=$_SESSION['patient_number'];
$host = "db.ist.utl.pt";
$user = "ist175573";
$pass = "swex6595";
$dsn = "mysql:host=$host;dbname=$user";

try
{
    $connection = new PDO($dsn, $user, $pass);
}
catch(PDOException $exception)
{
    echo("<p>Error: ");
    echo($exception->getMessage());
    echo("</p>");
    exit();
}

$sql = "SELECT P.number, P.name, W.pan, C.snum, C.manuf FROM Patient
as P, Wears as W, Connects as C WHERE

        P.number='$p_number' AND W.patient=P.number
        AND current_date<=W.end AND current_date>=W.start
        AND W.pan=C.pan AND current_date<=C.end AND
current_date>=C.start

        ";

$result = $connection->query($sql);

if ($result == FALSE)
{
    $info = $connection->errorInfo();
    echo("<p>Error: {$info[2]}</p>");
    exit();
}

```

```

echo("Actual:<br/>");

$rows= $result->rowCount();
if($rows!=0){
    echo("<table border=\"1\">");
    echo("<tr><td>number</td><td>name</td><td>pan</td><td>device
serial number</td><td>device manufacturer</td></tr>");
    foreach($result as $row)
    {
        echo("<tr><td>");
        echo($row['number']);
        echo("</td><td>");
        echo($row['name']);
        echo("</td><td>");
        echo($row['pan']);
        echo("</td><td>");
        echo($row['snum']);
        echo("</td><td>");
        echo($row['manuf']);
        echo("</td></tr>");
    }
    echo("</table>");
}else{
    echo("<p>Actual PAN has no devices attached</p>");
}

```

```

echo("<p></p> <p></p>");
echo("Previous PAN:");
echo("<br/>");

```

```

        $sql = "SELECT P.number, P.name, W.pan, C.snum, C.manuf, C.end FROM
Patient as P, Wears as W, Connects as C WHERE

                                P.number='$p_number'
                                AND W.patient=P.number AND
                                W.end>=all(SELECT W.end FROM Patient as
P, Wears as W WHERE P.number='$p_number'
                                AND W.patient=P.number AND
W.end<current_date AND W.end!='2999-12-31')
                                AND W.end<current_date AND
                                W.end!='2999-12-31'
                                AND W.pan=C.pan AND (C.start<=W.end
AND W.end<=C.end)

                                ";
        $result = $connection->query($sql);

        if ($result == FALSE)
        {
            $info = $connection->errorInfo();
            echo("<p>Error: {$info[2]}</p>");
            exit();
        }

        /*****Verify if previous pan is in
use*****/

        $sql = "SELECT * FROM Wears WHERE end='2999-12-31'
                                AND pan
in(SELECT W.pan FROM Patient as P, Wears as W, Connects as C WHERE

                                P.number='$p_number'

                                AND W.patient=P.number AND

                                W.end>=all(SELECT W.end FROM Patient as P, Wears as W WHERE
P.number='$p_number'

                                AND W.patient=P.number AND W.end<current_date AND W.end!='2999-12-31')

```

```

AND W.end<current_date AND          W.end!='2999-12-31'

AND W.pan=C.pan AND (C.start<=W.end AND W.end<=C.end))
                                AND patient
not in (SELECT P.number FROM Patient as P, Wears as W, Connects as C WHERE

P.number='$p_number'

AND W.patient=P.number AND

W.end>=all(SELECT W.end FROM Patient as P, Wears as W WHERE
P.number='$p_number'

AND W.patient=P.number AND W.end<current_date AND W.end!='2999-12-31')

AND W.end<current_date AND          W.end!='2999-12-31'

AND W.pan=C.pan AND (C.start<=W.end AND W.end<=C.end))

";

$result_verify = $connection->query($sql);

if ($result_verify == FALSE)
{
    $info = $connection->errorInfo();
    echo("<p>Error: {$info[2]}</p>");
    exit();
}

/*****/

$nrows= $result_verify->rowCount();

/*****
*****/

echo("<table border=\"1\">");

```

```

        echo("<tr><td>number</td><td>name</td><td>pan</td><td>device serial
number</td><td>device manufacturer</td><td>inserir?</td></tr>");

```

```

        foreach($result as $row)

```

```

        {

```

```

            echo("<tr><td>");

```

```

            echo($row['number']);

```

```

            echo("</td><td>");

```

```

            echo($row['name']);

```

```

            echo("</td><td>");

```

```

            echo($row['pan']);

```

```

            echo("</td><td>");

```

```

            echo($row['snum']);

```

```

            echo("</td><td>");

```

```

            echo($row['manuf']);

```

```

            echo("</td><td>");

```

```

            $device=$row['snum'];

```

```

            $device.=' ';

```

```

            $device.=$row['manuf'];

```

```

            if(($row['end']=='2999-12-31')&&($nrows==0))

```

```

            {

```

```

                echo("<input type=\"checkbox\" name=\"Device[]\"

```

```

value=\"$device\" />");

```

```

            }

```

```

            echo("</td></tr>");

```

```

        }

```

```

        echo("</table>");

```

```

        $connection = null;

```

```

?>

```

```

<p><input type="submit" value="Submit"/></p>

```

```

<p></p>

```

```

<p></p>

```

```
<p></p>

<p></p>

<p><a href="index__.php">Back to main menu</a></p>

</form>

</body>

</html>
```

Transfer_session3.php

```
<?php session_start(); ?>
```

```
<html>

<body>

<h2>Transferred devices:</h2>

<?php

$prev=$_SESSION['previous_pan'];

$new=$_SESSION['current_pan'];

$patient_nam=$_SESSION['patient_name'];

$p_number=$_SESSION['patient_number'];

$host = "db.ist.utl.pt";

$user = "ist175573";

$pass = "swex6595";

$dsn = "mysql:host=$host;dbname=$user";

try

{

    $connection = new PDO($dsn, $user, $pass);

}

catch(PDOException $exception)

{

    echo("<p>Error: ");

    echo($exception->getMessage());

    echo("</p>");

    exit();

}
```

```

foreach($_REQUEST as $key => $value)
{
    if($key=='Device')
    {
        foreach($_REQUEST[$key] as $Dev)
        {
            list($snum, $manuf) = explode(" ", $Dev);
            echo("<p> serial number:$snum,
Manufacturer:$manuf</p>");

            /*insert into Period the new time period
referenced to the new connection*/

            /*****/

            $sql = "SELECT start, end from Period
WHERE start=current_date AND end='2999-12-31'";

            $result = $connection->query($sql);

            if ($result == FALSE)
            {
                $info = $connection->errorInfo();
                echo("<p>Error: {$info[2]}</p>");
                exit();
            }

            /*****/

            $nrows= $result->rowCount();
            if($nrows==0) /*the data is not in the
Period table*/

            {
                $sql = "insert into Period values
(current_date, '2999-12-31')";

                $result = $connection->query($sql);

```



```

        if ($result == FALSE)
        {
            $info = $connection-
>errorInfo();
            echo("<p>Error:
{$info[2]}</p>");
            exit();
        }
    }
}

```

```

/*****

/*gets the begin date of connection of the
transferred device*/

$sql = "SELECT start from Connects
WHERE
                                snum IN (SELECT
C.snum FROM Patient as P, Wears as W, Connects as C WHERE

P.number='$p_number'

                                AND
W.patient=P.number AND

                                W.end>=all(SELECT W.end FROM Patient as P, Wears as W WHERE
P.number='$p_number'

                                AND
W.patient=P.number AND W.end<current_date AND W.end!='2999-12-31')

                                AND
W.end<current_date AND W.end!='2999-12-31'

                                AND
W.pan=C.pan AND (C.start<=W.end AND W.end<=C.end))

                                AND manuf
IN(SELECT C.manuf FROM Patient as P, Wears as W, Connects as C WHERE

```

```

P.number='$p_number'

AND

W.patient=P.number AND

W.end>=all(SELECT W.end FROM Patient as P, Wears as W WHERE
P.number='$p_number'

AND

W.patient=P.number AND W.end<current_date AND W.end!='2999-12-31')

AND

W.end<current_date AND W.end!='2999-12-31'

AND

W.pan=C.pan AND (C.start<=W.end AND W.end<=C.end));

$result = $connection->query($sql);

if ($result == FALSE)
{
    $info = $connection->errorInfo();
    echo("<p>Error: {"$info[2]}</p>");
    exit();
}

foreach($result as $row)
{
    /*updating Connection with
previous pan*/

    $start=$row['start'];

    /*****
    *****/

    $sql = "SELECT start, end from
Period WHERE start='$start' AND end=current_date";

    $result = $connection->query($sql);

```

```

        >errorInfo();

        {$info[2]}</p>");

        if ($result == FALSE)
        {
            $info = $connection-

            echo("<p>Error:

            exit();

        }

        /*****

        $nrows= $result->rowCount();
        if($nrows==0) /*the data is not in

        the Period table*/

        {

            $sql = "insert into Period

            values ('$start', current_date)";

            $result = $connection-

            >query($sql);

            if ($result == FALSE)
            {

                $info = $connection-

                echo("<p>Error:

                exit();

            }

        }

        /*****
        *****/

        $sql = "update Connects set
        end=current_date where start='$start' AND snum='$snum' AND

```

```

        AND end='2999-12-31' AND pan='$prev'';

        $result = $connection->query($sql);

        if ($result == FALSE)
        {
            $info = $connection-
>errorInfo();

            echo("<p>Error:

{$info[2]}</p>");

            exit();
        }

    }

    /**
    /*setting the new connection*/

    $sql = "insert into Connects values
(current_date, '2999-12-31', '$snum', '$manuf', '$new')";

    $result = $connection->query($sql);

    if ($result == FALSE)
    {
        $info = $connection-
>errorInfo();

        echo("<p>Error:

{$info[2]}</p>");

        exit();
    }

}

}

}

```

```
$connection = null;
```

```
?>
```

```
<p></p>
```

```
<p></p>
```

```
<p></p>
```

```
<a href="transfer_session2.php">Go back</a>
```

```
<p></p>
```

```
<p><a href="index__.php">Back to main menu</a></p>
```

```
</body>
```

```
</html>
```