SAS/Proc SQL

SAS seminar, October 2004 – MEB, KI
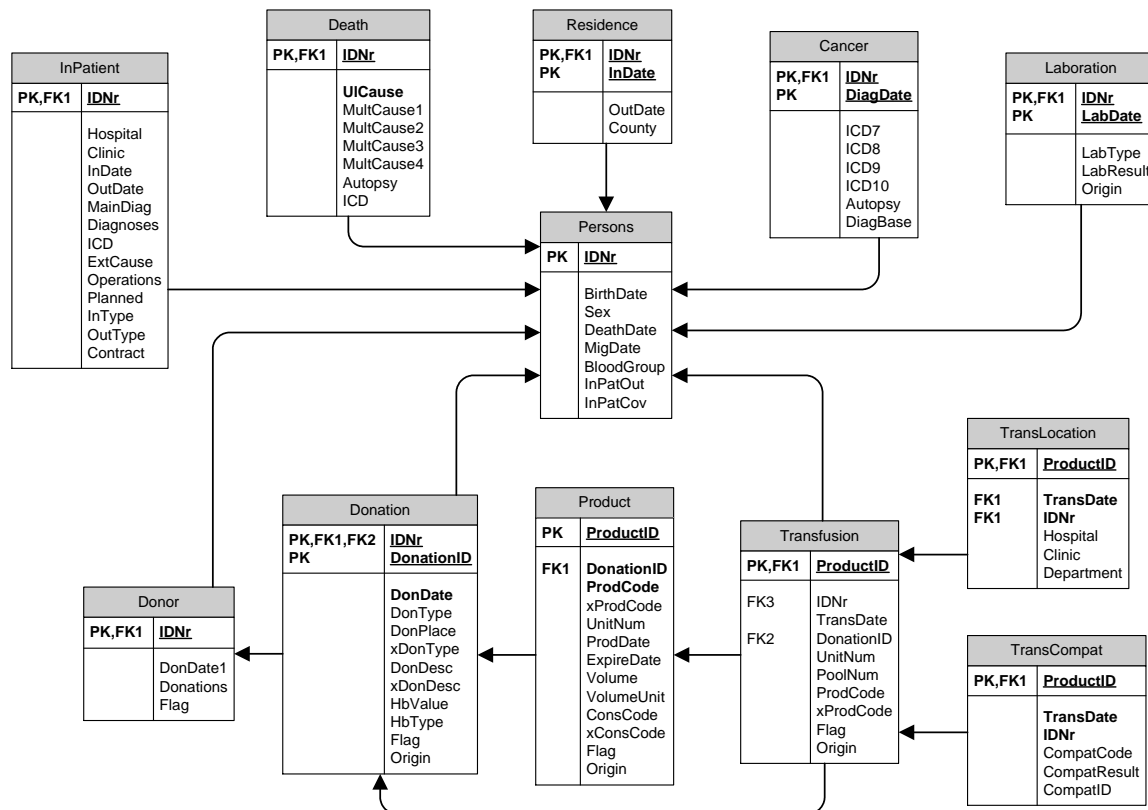
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Terminology

SAS Data step	Proc SQL
Dataset	Table
Variable	Column
Observation	Row
Merge	Join
Append	Union

Example database

InPatient

PK,FK1	IDNr
	Hospital
	Clinic
	InDate
	OutDate
	MainDiag
	Diagnoses
	ICD
	ExtCause
	Operations
	Planned
	InType
	OutType
	Contract

Death

PK,FK1	IDNr
	UlCause
	MultCause1
	MultCause2
	MultCause3
	MultCause4
	Autopsy
	ICD

Residence

PK,FK1 PK	IDNr InDate
	OutDate
	County

Cancer

PK,FK1 PK	IDNr DiagDate
	ICD7
	ICD8
	ICD9
	ICD10
	Autopsy
	DiagBase

Laboration

PK,FK1 PK	IDNr LabDate
	LabType
	LabResult
	Origin

Persons

PK	IDNr
	BirthDate
	Sex
	DeathDate
	MigDate
	BloodGroup
	InPatOut
	InPatCov

TransLocation

PK,FK1	ProductID
FK1 FK1	**TransDate IDNr**
	Hospital
	Clinic
	Department

Donor

PK,FK1	IDNr
	DonDate1
	Donations
	Flag

Donation

PK,FK1,FK2 PK	IDNr DonationID
	DonDate
	DonType
	DonPlace
	xDonType
	DonDesc
	xDonDesc
	HbValue
	HbType
	Flag
	Origin

Product

PK	ProductID
FK1	**DonationID ProdCode**
	xProdCode
	UnitNum
	ProdDate
	ExpireDate
	Volume
	VolumeUnit
	ConsCode
	xConsCode
	Flag
	Origin

Transfusion

PK,FK1	ProductID
FK3	IDNr
	TransDate
FK2	DonationID
	UnitNum
	PoolNum
	ProdCode
	xProdCode
	Flag
	Origin

TransCompat

PK,FK1	ProductID
	TransDate IDNr
	CompatCode
	CompatResult
	CompatID

Syntax

Retrieving data

```
proc sql;
   create table tablename as
   select [distinct]
      column1,
      column2,
      [*], …
   from library.table
   where expression
   order by column1 etc.;
   quit;
```

<u>Example 1</u>

```
proc sql;
   create table men as
   select *
   from cblood.persons
   where sex = 1;
   quit;
```

<u>Example 2</u>

```
proc sql;
   create table men as
   select
      idnr,
      birthdate
   from cblood.persons
   where sex = 1
   order by birthdate;
   quit;
```

<u>Example 3</u>

```
proc sql;
   create table patient as
   select
      distinct idnr
   from cblood.transfusion;
   quit;
```

Modifying/creating columns

```
proc sql;
   create table tablename as
   select
      function(column1) as newcolumn1,
      column2 [+|-|*|/] column3 as newcolumn2,
      …
   from library.table;
   quit;
```

Example 4
```
proc sql;
   create table dead as
   select
      idnr,
      (deathdate-birthdate)/365.25 as deathage
   from cblood.transfusion
   where deathdate ^= .;
   quit;
```

Example 5
```
proc sql;
   create table blc as
   select distinct
      substr(donationid,2,3) as blc
   from cblood.donation;
   quit;
```

Summary functions
```
proc sql;
   create table tablename as
      select function(*) as alias
      from libname.table
      group by byvariable1
      having conditions;
   quit;
```

Example 6
```
proc sql;
   create table donations as
   select
      idnr,
      count(*) as count
   from cblood.donation
   group by idnr;
   quit;
```

Example 7
```
proc sql;
   create table toomany as
   select
      idnr,
      year(dondate) as year
   from cblood.donation
   where sex=1
   group by idnr, year(dondate)
   having count(*) > 4
   quit;
```

Combining tables

```
proc sql;
   create table tablename as
   select
      [alias1.column, alias2.column, *, etc.]
   from
      libname.table1 as alias1, libname.table2 as alias2
   where alias1.column=alias2.column;
   quit;
```

Example 8

```
proc sql;
   create table donationage as
   select
      a.idnr,
      a.dondate,
      %age(a.dondate, b.birthdate) as age
   from cblood.donation as a,
      cblood.persons as b
   where a.idnr=b.idnr;
   quit;
```

Combining tables 2

```
proc sql;
   create table tablename as
   select
      [alias1.column, alias2.column, *, etc.]
   from
      libname.table1 as alias1
      [inner | outer | left | right] join
      libname.table2 as alias2
      on alias1.column=alias2.column;
   quit;
```

Example 9

```
proc sql;
   create table cancerdonor as
   select
      a.idnr,
      (max(dondate)-min(dondate))/ 365.25 as dontime,
      b.icd7,
      b.diadate
   from cblood.donation as a
      left join cblood.cancer as b
   on a.idnr=b.idnr
   group by a.idnr, b.icd7, b.diadate;
   quit;
```

Age macro

```
%macro age(date,birth);
   floor((intck('month',&birth,&date)-(day(&date)<day(&birth)))/12)
%mend age;
```