**Project Sunshine Deserts Query**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| departments | | |  | employees | | |
| dept\_no | CHAR(4) | PK |  | emp\_no | int | PK |
| dept\_name | varchar(50) | NOT NULL |  | birth\_date | DATE | NOT NULL |
|  |  |  |  | first\_name | varchar(50) | NOT NULL |
| dept\_emp | | |  | last\_name | varchar(50) | NOT NULL |
| dept\_emp\_id | int | PK |  | gender | CHAR(1) | NOT NULL |
| emp\_no | int | FK |  | hire\_date | DATE | NOT NULL |
| dept\_no | CHAR(4) | FK |  |  |  |  |
| from\_date | DATE | NOT NULL |  | salaries | | |
| to\_date | DATE | NOT NULL |  | salaries\_id | int | PK |
|  |  |  |  | emp\_no | int | FK |
|  |  |  |  | salary | decimal(16,2) | NOT NULL |
|  |  |  |  | from\_date | DATE | NOT NULL |
|  |  |  |  | to\_date | DATE | NOT NULL |

CREATE DATABASE Sunshine\_Deserts;

USE Sunshine\_Deserts;

alter table salaries

add foreign key (emp\_no) references employees (emp\_no);

alter table dept\_emp

add foreign key (emp\_no) references employees (emp\_no);

alter table dept\_emp

add foreign key (dept\_no) references departments (dept\_no);

**Task 1. Submit some top level figures regarding the business**

* **The total number of employees, the total salary spend and the gender balance between in 1985 and now in the year 2001 – across the company as a whole and then within the various departments.**

--1.1.1 The total number of employees between 1985-2001 across the company

SELECT COUNT(DISTINCT s.emp\_no) as 'Total number of employees'

FROM salaries s

WHERE year(s.from\_date) <2002;

**Result: 11797**

--1.1.2 The total number of employees between 1985-2001 across the company by year

SELECT year(from\_date) as Year, COUNT(DISTINCT emp\_no) as 'Total number of employees'

FROM salaries

WHERE year(from\_date) <2002

GROUP BY year(from\_date)

order by year(from\_date);

**Result:**

**1985 667**

**1986 1455**

**1987 2230**

**1988 3009**

**1989 3716**

**1990 4480**

**1991 5198**

**1992 5947**

**1993 6593**

**1994 7272**

**1995 7914**

**1996 8615**

**1997 9225**

**1998 9762**

**1999 10298**

**2000 10073**

**2001 9804**

--1.1.3 The total number of employees between 1985-2001 across the departments by year

SELECT year(s.from\_date) as Year, d.dept\_name, COUNT(DISTINCT s.emp\_no) as 'Total number of employees'

FROM salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE year(s.from\_date) <2002 and s.from\_date between de.from\_date and de.to\_date

GROUP BY year(s.from\_date), d.dept\_name

order by year(s.from\_date), d.dept\_name;

**Result:**

1985 Customer Service 34

1985 Development 177

1985 Finance 42

1985 Human Resources 37

1985 Marketing 31

1985 Production 159

1985 Quality Management 42

1985 Research 32

1985 Sales 113

1986 Customer Service 71

1986 Development 394

1986 Finance 84

1986 Human Resources 76

1986 Marketing 83

1986 Production 342

1986 Quality Management 76

1986 Research 80

1986 Sales 249

1987 Customer Service 110

1987 Development 624

1987 Finance 126

1987 Human Resources 122

1987 Marketing 105

1987 Production 502

1987 Quality Management 126

1987 Research 124

1987 Sales 391

1988 Customer Service 153

1988 Development 827

1988 Finance 167

1988 Human Resources 165

1988 Marketing 146

1988 Production 694

1988 Quality Management 175

1988 Research 161

1988 Sales 521

1989 Customer Service 204

1989 Development 1019

1989 Finance 220

1989 Human Resources 207

1989 Marketing 182

1989 Production 857

1989 Quality Management 207

1989 Research 202

1989 Sales 618

1990 Customer Service 250

1990 Development 1236

1990 Finance 260

1990 Human Resources 242

1990 Marketing 223

1990 Production 1039

1990 Quality Management 245

1990 Research 244

1990 Sales 741

1991 Customer Service 313

1991 Development 1411

1991 Finance 301

1991 Human Resources 278

1991 Marketing 268

1991 Production 1222

1991 Quality Management 286

1991 Research 278

1991 Sales 841

1992 Customer Service 359

1992 Development 1617

1992 Finance 333

1992 Human Resources 312

1992 Marketing 308

1992 Production 1391

1992 Quality Management 324

1992 Research 333

1992 Sales 970

1993 Customer Service 394

1993 Development 1804

1993 Finance 365

1993 Human Resources 352

1993 Marketing 341

1993 Production 1528

1993 Quality Management 362

1993 Research 370

1993 Sales 1078

1994 Customer Service 453

1994 Development 1985

1994 Finance 397

1994 Human Resources 397

1994 Marketing 371

1994 Production 1680

1994 Quality Management 401

1994 Research 403

1994 Sales 1185

1995 Customer Service 501

1995 Development 2123

1995 Finance 425

1995 Human Resources 440

1995 Marketing 406

1995 Production 1830

1995 Quality Management 439

1995 Research 446

1995 Sales 1304

1996 Customer Service 549

1996 Development 2286

1996 Finance 461

1996 Human Resources 480

1996 Marketing 457

1996 Production 1992

1996 Quality Management 488

1996 Research 488

1996 Sales 1414

1997 Customer Service 596

1997 Development 2448

1997 Finance 495

1997 Human Resources 529

1997 Marketing 499

1997 Production 2120

1997 Quality Management 528

1997 Research 519

1997 Sales 1491

1998 Customer Service 645

1998 Development 2578

1998 Finance 523

1998 Human Resources 562

1998 Marketing 529

1998 Production 2216

1998 Quality Management 569

1998 Research 551

1998 Sales 1589

1999 Customer Service 697

1999 Development 2694

1999 Finance 557

1999 Human Resources 582

1999 Marketing 572

1999 Production 2328

1999 Quality Management 600

1999 Research 591

1999 Sales 1677

2000 Customer Service 719

2000 Development 2621

2000 Finance 531

2000 Human Resources 567

2000 Marketing 569

2000 Production 2280

2000 Quality Management 585

2000 Research 584

2000 Sales 1618

2001 Customer Service 708

2001 Development 2532

2001 Finance 514

2001 Human Resources 553

2001 Marketing 562

2001 Production 2225

2001 Quality Management 571

2001 Research 579

2001 Sales 1561

--1.2.1 The total salary spend between 1985-2001

WITH subquery AS(

                 select emp\_no, from\_date, to\_date, salary, CAST(Salary/365\*DATEDIFF(day, from\_date, to\_date)AS DECIMAL(16,2)) AS 'salary\_spend'

                 from salaries

                 WHERE YEAR(from\_date) <2002 and Year(to\_date)!=9999

union all

                 select emp\_no, from\_date, to\_date, salary, salary AS 'salary\_spend'

                 from salaries

                 WHERE YEAR(from\_date)<2002 and YEAR(to\_date) =9999

                 )

select SUM (salary\_spend) as 'Total salary spend between 1985-2001'

from subquery;

**Result:** **6684818823.31**

--1.2.2 The total salary spend between 1985-2001 across the company by year

WITH subquery AS(

                 select emp\_no, year(from\_date) as YEAR, from\_date, to\_date, salary, CAST(Salary/365\*DATEDIFF(day, from\_date, to\_date)AS DECIMAL(16,2)) AS 'salary\_spend'

                 from salaries

                 WHERE YEAR(from\_date) <2002 and Year(to\_date)!=9999

                 union all

                 select emp\_no, year(from\_date)as YEAR, from\_date, to\_date, salary, salary AS 'salary\_spend'

                 from salaries

                 WHERE YEAR(from\_date)<2002 and YEAR(to\_date) =9999

                 )

select year, SUM (salary\_spend) as 'Total salary spend between 1985-2001'

from subquery

group by year

order by 1;

**Result:**

**1985 36137121.40**

**1986 79702993.17**

**1987 123323345.73**

**1988 168891745.43**

**1989 211103909.34**

**1990 257900806.02**

**1991 305014242.68**

**1992 354446484.77**

**1993 399240917.88**

**1994 446170493.69**

**1995 492378257.52**

**1996 544284394.20**

**1997 589132528.63**

**1998 632721407.28**

**1999 676484346.21**

**2000 683729580.37**

**2001 684156248.99**

--1.2.3. The total salary spend between 1985-2001 across the departments by year

WITH subquery AS(

                 select s.emp\_no, year(s.from\_date) as YEAR, d.dept\_name, s.from\_date, s.to\_date, salary, CAST(s.Salary/365\*DATEDIFF(day, s.from\_date, s.to\_date)AS DECIMAL(16,2)) AS 'salary\_spend'

                 from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

                 WHERE YEAR(s.from\_date) <2002 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and YEAR(s.to\_date) !=9999

                 union all

                 select s.emp\_no, year(s.from\_date)as YEAR, d.dept\_name, s.from\_date, s.to\_date, s.salary, s.salary AS 'salary\_spend'

                 from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

                 WHERE YEAR(s.from\_date)<2002 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and YEAR(s.to\_date) =9999

                 )

select year, dept\_name, SUM (salary\_spend) as 'Total salary spend between 1985-2001'

from subquery

group by year, dept\_name

order by 1;

**Result:**

**1985 Marketing 1847422.12**

**1985 Sales 8009304.95**

**1985 Quality Management 1943585.07**

**1985 Research 1593910.56**

**1985 Customer Service 1480896.00**

**1985 Production 7849445.99**

**1985 Human Resources 1717332.00**

**1985 Development 9052174.71**

**1985 Finance 2643050.00**

**1986 Marketing 5182135.98**

**1986 Customer Service 3191065.00**

**1986 Sales 17766527.23**

**1986 Human Resources 3528010.28**

**1986 Development 19922129.73**

**1986 Quality Management 3639688.26**

**1986 Research 3937802.17**

**1986 Finance 5305901.64**

**1986 Production 17229732.88**

**1987 Human Resources 5691486.00**

**1987 Marketing 6803675.00**

**1987 Development 31717233.96**

**1987 Research 6248411.46**

**1987 Quality Management 6066397.09**

**1987 Production 25578205.09**

**1987 Customer Service 5100767.69**

**1987 Finance 8019865.37**

**1987 Sales 28097304.07**

**1988 Marketing 9480958.17**

**1988 Research 8318443.75**

**1988 Human Resources 7927086.00**

**1988 Development 42437934.27**

**1988 Quality Management 8619414.97**

**1988 Finance 10729925.24**

**1988 Production 36088368.54**

**1988 Sales 38180007.53**

**1988 Customer Service 7109606.96**

**1989 Marketing 11640627.12**

**1989 Human Resources 9995602.76**

**1989 Research 10819257.46**

**1989 Customer Service 9754173.26**

**1989 Sales 45872835.47**

**1989 Quality Management 10269594.78**

**1989 Finance 14212583.59**

**1989 Development 53310478.72**

**1989 Production 45228756.18**

**1990 Human Resources 11914364.20**

**1990 Customer Service 12335246.70**

**1990 Production 55467682.91**

**1990 Marketing 14413617.95**

**1990 Finance 16945723.65**

**1990 Research 13274141.79**

**1990 Development 65385558.20**

**1990 Sales 55713652.91**

**1990 Quality Management 12450817.71**

**1991 Production 66162129.35**

**1991 Customer Service 15792163.14**

**1991 Finance 19917547.61**

**1991 Development 76712071.09**

**1991 Human Resources 14009285.38**

**1991 Research 15360503.28**

**1991 Marketing 17718974.59**

**1991 Sales 64270387.07**

**1991 Quality Management 15071181.17**

**1992 Human Resources 16160286.16**

**1992 Production 76869815.48**

**1992 Customer Service 18511312.31**

**1992 Finance 22435865.89**

**1992 Research 18518140.73**

**1992 Marketing 20631541.12**

**1992 Quality Management 17543272.40**

**1992 Sales 74549295.78**

**1992 Development 89226954.90**

**1993 Customer Service 20936770.05**

**1993 Finance 24815302.47**

**1993 Production 86454220.08**

**1993 Human Resources 18322567.42**

**1993 Sales 83464835.29**

**1993 Development 101204034.13**

**1993 Marketing 23237029.94**

**1993 Quality Management 19798736.24**

**1993 Research 21007422.26**

**1994 Customer Service 24420020.86**

**1994 Production 96210611.59**

**1994 Finance 27169197.60**

**1994 Sales 92724364.69**

**1994 Research 23213132.84**

**1994 Marketing 25944302.09**

**1994 Quality Management 22295406.37**

**1994 Development 113108277.88**

**1994 Human Resources 21085179.77**

**1995 Finance 29413467.94**

**1995 Production 106121024.19**

**1995 Sales 103132963.18**

**1995 Development 123027807.18**

**1995 Marketing 28334119.26**

**1995 Quality Management 25055628.67**

**1995 Human Resources 23626707.10**

**1995 Customer Service 27566703.36**

**1995 Research 26099836.64**

**1996 Finance 32319154.52**

**1996 Sales 113068975.69**

**1996 Quality Management 28127624.02**

**1996 Development 134590820.64**

**1996 Marketing 32504537.25**

**1996 Human Resources 26123828.05**

**1996 Customer Service 30931493.23**

**1996 Production 117515516.88**

**1996 Research 29102443.92**

**1997 Quality Management 30636197.37**

**1997 Sales 120543478.32**

**1997 Finance 35008598.07**

**1997 Human Resources 29272008.27**

**1997 Production 126525624.19**

**1997 Customer Service 34457939.65**

**1997 Research 31450868.92**

**1997 Marketing 35803485.62**

**1997 Development 145434328.22**

**1998 Marketing 38453316.79**

**1998 Quality Management 33740864.63**

**1998 Sales 129020709.07**

**1998 Research 33731690.74**

**1998 Production 134849366.04**

**1998 Customer Service 38087790.73**

**1998 Finance 37154477.83**

**1998 Development 155911817.93**

**1998 Human Resources 31771373.52**

**1999 Human Resources 33631777.04**

**1999 Sales 137042515.18**

**1999 Development 165705034.34**

**1999 Marketing 41979650.81**

**1999 Customer Service 41870240.12**

**1999 Production 143497126.75**

**1999 Finance 39580125.07**

**1999 Research 36909611.59**

**1999 Quality Management 36268265.31**

**2000 Human Resources 33934623.96**

**2000 Marketing 42988556.90**

**2000 Development 166658983.49**

**2000 Research 37817697.61**

**2000 Finance 39325196.50**

**2000 Sales 135919089.08**

**2000 Customer Service 44609357.18**

**2000 Production 145659441.86**

**2000 Quality Management 36816633.79**

**2001 Sales 133995638.92**

**2001 Marketing 43594679.80**

**2001 Quality Management 37106949.34**

**2001 Research 38473383.85**

**2001 Human Resources 34180597.60**

**2001 Development 166050517.13**

**2001 Production 146312451.24**

**2001 Customer Service 45934986.54**

**2001 Finance 38507044.57**

--1.3.1. The total gender balance between 1985-2001 across the company

WITH subquery AS (

select distinct s.emp\_no, e.gender

from salaries s, employees e

WHERE s.emp\_no=e.emp\_no and

from\_date <= '2001-12-31'

)

select gender, count (gender) as 'Total employees'

from subquery

group by gender;

**Result:**

**F 4767**

**M 7030**

--1.3.2. The gender balance between 1985-2001 across the company by year

WITH subquery AS (

select s.emp\_no, e.gender, datename (year, s.from\_date) as Year, s.from\_date, s.to\_date

from salaries s, employees e

WHERE s.emp\_no=e.emp\_no and

from\_date <= '2001-12-31'

)

select year, gender, count (gender) as 'Total employees'

from subquery

group by gender, Year

order by year, subquery.gender;

**Result:**

1985 F 270

1985 M 397

1986 F 567

1986 M 888

1987 F 886

1987 M 1344

1988 F 1200

1988 M 1813

1989 F 1480

1989 M 2236

1990 F 1804

1990 M 2676

1991 F 2100

1991 M 3098

1992 F 2418

1992 M 3538

1993 F 2663

1993 M 3930

1994 F 2932

1994 M 4340

1995 F 3216

1995 M 4698

1996 F 3505

1996 M 5136

1997 F 3747

1997 M 5478

1998 F 3957

1998 M 5805

1999 F 4148

1999 M 6150

2000 F 4068

2000 M 6036

2001 F 3950

2001 M 5854

--1.3.3. The gender balance between 1985-2001 across the departments by year

WITH subquery AS (

select s.emp\_no, e.gender, datename (year, s.from\_date) as Year, s.from\_date, s.to\_date, d.dept\_name

from salaries s

inner join dept\_emp de

on s.emp\_no=de.emp\_no

inner join employees e

on de.emp\_no=e.emp\_no

inner join departments d

on d.dept\_no=de.dept\_no

WHERE s.from\_date <= '2001-12-31' and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

)

select Year, dept\_name, gender, count (gender) as 'Gender'

from subquery

group by dept\_name, Year, gender

order by year, dept\_name, subquery.gender;

**Result:**

1985 Customer Service F 17

1985 Customer Service M 17

1985 Development F 71

1985 Development M 106

1985 Finance F 21

1985 Finance M 21

1985 Human Resources F 13

1985 Human Resources M 24

1985 Marketing F 12

1985 Marketing M 19

1985 Production F 66

1985 Production M 93

1985 Quality Management F 14

1985 Quality Management M 28

1985 Research F 12

1985 Research M 20

1985 Sales F 44

1985 Sales M 69

1986 Customer Service F 30

1986 Customer Service M 41

1986 Development F 153

1986 Development M 241

1986 Finance F 36

1986 Finance M 48

1986 Human Resources F 25

1986 Human Resources M 51

1986 Marketing F 30

1986 Marketing M 53

1986 Production F 137

1986 Production M 205

1986 Quality Management F 28

1986 Quality Management M 48

1986 Research F 22

1986 Research M 58

1986 Sales F 106

1986 Sales M 143

1987 Customer Service F 49

1987 Customer Service M 61

1987 Development F 240

1987 Development M 384

1987 Finance F 51

1987 Finance M 75

1987 Human Resources F 45

1987 Human Resources M 77

1987 Marketing F 41

1987 Marketing M 64

1987 Production F 209

1987 Production M 293

1987 Quality Management F 46

1987 Quality Management M 80

1987 Research F 40

1987 Research M 84

1987 Sales F 165

1987 Sales M 226

1988 Customer Service F 67

1988 Customer Service M 86

1988 Development F 310

1988 Development M 517

1988 Finance F 67

1988 Finance M 100

1988 Human Resources F 61

1988 Human Resources M 105

1988 Marketing F 59

1988 Marketing M 87

1988 Production F 294

1988 Production M 403

1988 Quality Management F 69

1988 Quality Management M 106

1988 Research F 52

1988 Research M 109

1988 Sales F 221

1988 Sales M 300

1989 Customer Service F 90

1989 Customer Service M 114

1989 Development F 395

1989 Development M 624

1989 Finance F 89

1989 Finance M 131

1989 Human Resources F 76

1989 Human Resources M 131

1989 Marketing F 69

1989 Marketing M 113

1989 Production F 348

1989 Production M 509

1989 Quality Management F 85

1989 Quality Management M 122

1989 Research F 69

1989 Research M 133

1989 Sales F 259

1989 Sales M 359

1990 Customer Service F 111

1990 Customer Service M 139

1990 Development F 490

1990 Development M 746

1990 Finance F 112

1990 Finance M 148

1990 Human Resources F 86

1990 Human Resources M 156

1990 Marketing F 84

1990 Marketing M 139

1990 Production F 418

1990 Production M 621

1990 Quality Management F 101

1990 Quality Management M 144

1990 Research F 81

1990 Research M 163

1990 Sales F 321

1990 Sales M 420

1991 Customer Service F 138

1991 Customer Service M 175

1991 Development F 553

1991 Development M 858

1991 Finance F 136

1991 Finance M 165

1991 Human Resources F 96

1991 Human Resources M 182

1991 Marketing F 98

1991 Marketing M 170

1991 Production F 490

1991 Production M 732

1991 Quality Management F 122

1991 Quality Management M 164

1991 Research F 98

1991 Research M 180

1991 Sales F 369

1991 Sales M 472

1992 Customer Service F 159

1992 Customer Service M 201

1992 Development F 651

1992 Development M 968

1992 Finance F 142

1992 Finance M 190

1992 Human Resources F 109

1992 Human Resources M 205

1992 Marketing F 116

1992 Marketing M 193

1992 Production F 557

1992 Production M 835

1992 Quality Management F 146

1992 Quality Management M 179

1992 Research F 117

1992 Research M 216

1992 Sales F 420

1992 Sales M 551

1993 Customer Service F 168

1993 Customer Service M 226

1993 Development F 718

1993 Development M 1085

1993 Finance F 155

1993 Finance M 210

1993 Human Resources F 130

1993 Human Resources M 222

1993 Marketing F 131

1993 Marketing M 210

1993 Production F 601

1993 Production M 927

1993 Quality Management F 162

1993 Quality Management M 200

1993 Research F 135

1993 Research M 235

1993 Sales F 463

1993 Sales M 615

1994 Customer Service F 192

1994 Customer Service M 261

1994 Development F 787

1994 Development M 1198

1994 Finance F 171

1994 Finance M 226

1994 Human Resources F 146

1994 Human Resources M 251

1994 Marketing F 147

1994 Marketing M 224

1994 Production F 668

1994 Production M 1012

1994 Quality Management F 176

1994 Quality Management M 225

1994 Research F 140

1994 Research M 263

1994 Sales F 505

1994 Sales M 680

1995 Customer Service F 219

1995 Customer Service M 282

1995 Development F 849

1995 Development M 1274

1995 Finance F 187

1995 Finance M 238

1995 Human Resources F 164

1995 Human Resources M 276

1995 Marketing F 162

1995 Marketing M 244

1995 Production F 733

1995 Production M 1096

1995 Quality Management F 188

1995 Quality Management M 251

1995 Research F 158

1995 Research M 288

1995 Sales F 555

1995 Sales M 749

1996 Customer Service F 248

1996 Customer Service M 305

1996 Development F 908

1996 Development M 1388

1996 Finance F 193

1996 Finance M 268

1996 Human Resources F 182

1996 Human Resources M 299

1996 Marketing F 182

1996 Marketing M 278

1996 Production F 799

1996 Production M 1196

1996 Quality Management F 203

1996 Quality Management M 285

1996 Research F 179

1996 Research M 310

1996 Sales F 611

1996 Sales M 807

1997 Customer Service F 261

1997 Customer Service M 335

1997 Development F 973

1997 Development M 1475

1997 Finance F 209

1997 Finance M 286

1997 Human Resources F 194

1997 Human Resources M 335

1997 Marketing F 204

1997 Marketing M 295

1997 Production F 855

1997 Production M 1265

1997 Quality Management F 219

1997 Quality Management M 309

1997 Research F 191

1997 Research M 328

1997 Sales F 641

1997 Sales M 850

1998 Customer Service F 277

1998 Customer Service M 368

1998 Development F 1022

1998 Development M 1556

1998 Finance F 222

1998 Finance M 301

1998 Human Resources F 205

1998 Human Resources M 357

1998 Marketing F 216

1998 Marketing M 313

1998 Production F 899

1998 Production M 1316

1998 Quality Management F 233

1998 Quality Management M 335

1998 Research F 203

1998 Research M 348

1998 Sales F 680

1998 Sales M 909

1999 Customer Service F 292

1999 Customer Service M 405

1999 Development F 1056

1999 Development M 1638

1999 Finance F 232

1999 Finance M 325

1999 Human Resources F 209

1999 Human Resources M 373

1999 Marketing F 232

1999 Marketing M 340

1999 Production F 941

1999 Production M 1386

1999 Quality Management F 249

1999 Quality Management M 351

1999 Research F 221

1999 Research M 370

1999 Sales F 715

1999 Sales M 962

2000 Customer Service F 306

2000 Customer Service M 415

2000 Development F 1031

2000 Development M 1598

2000 Finance F 220

2000 Finance M 313

2000 Human Resources F 204

2000 Human Resources M 364

2000 Marketing F 227

2000 Marketing M 343

2000 Production F 926

2000 Production M 1361

2000 Quality Management F 242

2000 Quality Management M 348

2000 Research F 222

2000 Research M 363

2000 Sales F 690

2000 Sales M 931

2001 Customer Service F 305

2001 Customer Service M 403

2001 Development F 995

2001 Development M 1537

2001 Finance F 210

2001 Finance M 303

2001 Human Resources F 198

2001 Human Resources M 354

2001 Marketing F 224

2001 Marketing M 338

2001 Production F 891

2001 Production M 1334

2001 Quality Management F 236

2001 Quality Management M 335

2001 Research F 226

2001 Research M 353

2001 Sales F 664

2001 Sales M 897

**Task 2.** She is interested to compare salary spend in the year the business was established (1985) versus the spend in 2001

* How has the salary profile changed within the company, 1985 vs 2001 across each of the departments?
* Is there a metric that you would recommend as a basis to compare the spend within each department? Why would you consider one Vs another?
* Given the gap between the two periods of time 1985 and 2001, what should be taken into account when comparing the figures? Would you recommend a mechanism to adjust the figures?

As you analyse the salary spend, are there other analyses you would recommend that would inform the CEO on the various changes taking place? Is the data limiting your analysis in anyway and how might you overcome those limitations?

--2.1. How has the total salary spend changed within the company, 1985 vs 2001 across each of the departments?

WITH subquery AS(

select 1985 as Year, CAST(s.Salary/365\*DATEDIFF(day, s.from\_date, s.to\_date)AS DECIMAL(16,2)) AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) = 1985 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

union all

select 2001 as Year, CAST(s.Salary/365\*DATEDIFF(day, s.from\_date, s.to\_date)AS DECIMAL(16,2)) AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date!='9999'

union all

select 2001 as Year, s.Salary AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date='9999'

)

select dept\_name, Year, SUM (salary\_spend) as 'Salary spend'

from subquery

group by Year, dept\_name

order by dept\_name, year;

**Result:**

**Customer Service 1985 1480896.00**

**Customer Service 2001 45934986.54**

**Development 1985 9052174.71**

**Development 2001 166050517.13**

**Finance 1985 2643050.00**

**Finance 2001 38507044.57**

**Human Resources 1985 1717332.00**

**Human Resources 2001 34180597.60**

**Marketing 1985 1847422.12**

**Marketing 2001 43594679.80**

**Production 1985 7849445.99**

**Production 2001 146312451.24**

**Quality Management 1985 1943585.07**

**Quality Management 2001 37106949.34**

**Research 1985 1593910.56**

**Research 2001 38473383.85**

**Sales 1985 8009304.95**

**Sales 2001 133995638.92**

--2.2. How has the ratio of salaries paid in departments in relation to total expenses changed?

WITH subquery AS(

select 1985 as Year, CAST(s.Salary/365\*DATEDIFF(day, s.from\_date, s.to\_date)AS DECIMAL(16,2)) AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) = 1985 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

union all

select 2001 as Year, CAST(s.Salary/365\*DATEDIFF(day, s.from\_date, s.to\_date)AS DECIMAL(16,2)) AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date!='9999'

union all

select 2001 as Year, s.Salary AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date='9999'

)

select dept\_name, Year, SUM (salary\_spend) as 'Salary', SUM(salary\_spend)\*100.0/SUM(sum(salary\_spend)) OVER (PARTITION BY Year) AS 'Percentage'

from subquery

group by Year, dept\_name

order by dept\_name, year;

**Result:**

Customer Service 1985 1480896.00 4.097991

Customer Service 2001 45934986.54 6.714107

Development 1985 9052174.71 25.049517

Development 2001 166050517.13 24.270847

Finance 1985 2643050.00 7.313947

Finance 2001 38507044.57 5.628399

Human Resources 1985 1717332.00 4.752265

Human Resources 2001 34180597.60 4.996022

Marketing 1985 1847422.12 5.112255

Marketing 2001 43594679.80 6.372035

Production 1985 7849445.99 21.721281

Production 2001 146312451.24 21.385823

Quality Management 1985 1943585.07 5.378361

Quality Management 2001 37106949.34 5.423753

Research 1985 1593910.56 4.410729

Research 2001 38473383.85 5.623479

Sales 1985 8009304.95 22.163649

Sales 2001 133995638.92 19.585531

--2.3.How did the average salary within the company change in 1985 compared to 2001 in each of the departments?

WITH subquery AS(

select 1985 as Year, s.salary, d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) = 1985 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

union all

select 2001 as Year, s.salary, d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date!='9999'

union all

select 2001 as Year, s.Salary AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date='9999'

)

select dept\_name, Year, cast (AVG (salary) as decimal(16,2)) as 'Salary'

from subquery

group by Year, dept\_name

order by dept\_name, year;

**Result:**

**Customer Service 1985 43555.76**

**Customer Service 2001 65634.33**

**Development 1985 51267.97**

**Development 2001 66316.08**

**Finance 1985 62929.76**

**Finance 2001 76251.48**

**Human Resources 1985 46414.38**

**Human Resources 2001 62751.75**

**Marketing 1985 62806.42**

**Marketing 2001 78560.83**

**Production 1985 49555.18**

**Production 2001 66599.84**

**Quality Management 1985 47196.90**

**Quality Management 2001 65239.61**

**Research 1985 51208.00**

**Research 2001 67479.22**

**Sales 1985 70880.27**

**Sales 2001 87128.91**

--2.4.How did the average salary within the company change in 1986 compared to 2001 in each of the departments, assuming inflation of 61.65%?

WITH subquery AS(

select '1985+inf' as Year, s.salary\*1.6165 AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) = 1985 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

union all

select '2001' as Year, s.salary AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date!='9999'

union all

select '2001' as Year, s.Salary AS 'salary\_spend', d.dept\_name

from salaries s

INNER JOIN dept\_emp de

ON s.emp\_no = de.emp\_no

INNER JOIN departments d

ON de.dept\_no = d.dept\_no

WHERE YEAR(s.from\_date) =2001 and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date and s.to\_date='9999'

)

select dept\_name, Year, cast (AVG (salary\_spend) as decimal(16,2)) as 'Salary'

from subquery

group by Year, dept\_name

order by dept\_name, year;

**Result:**

Customer Service 1985+inf 70407.89

Customer Service 2001 65634.33

Development 1985+inf 82874.67

Development 2001 66316.08

Finance 1985+inf 101725.96

Finance 2001 76251.48

Human Resources 1985+inf 75028.84

Human Resources 2001 62751.75

Marketing 1985+inf 101526.58

Marketing 2001 78560.83

Production 1985+inf 80105.95

Production 2001 66599.84

Quality Management 1985+inf 76293.80

Quality Management 2001 65239.61

Research 1985+inf 82777.73

Research 2001 67479.22

Sales 1985+inf 114577.95

Sales 2001 87128.91

**Task 3. Which** gender balance in 2001 Vs 1985:

* What is the gender profile across the departments?
* How could these be explained?
* What about salary? Is there a salary bias?
* Are some departments more gender biased than others? Has this balance changed?

The board will want to understand trends you identify, are some departments more balanced than others? Why might that be the case?

--3.1. what percentage of women and men worked in the company in 1985 and 2001 ?

SELECT Year, gender, COUNT(gender) AS 'Gender',

COUNT(gender)\*100.0/SUM(COUNT(gender)) OVER (PARTITION BY Year) AS 'Percentage'

FROM (

SELECT datename(year, s.from\_date) AS Year, e.gender

FROM salaries s

INNER JOIN employees e ON s.emp\_no=e.emp\_no

WHERE datename(year, s.from\_date) = 1985 OR datename(year, s.from\_date) = 2001

) AS subquery

GROUP BY Year, gender

ORDER BY Year, subquery.gender;

**Result:**

1985 F 270 40.479760119940

1985 M 397 59.520239880059

2001 F 3950 40.289677682578

2001 M 5854 59.710322317421

--3.2.How many women and men worked in 2001 compared to 1985 by department?

WITH subquery AS (

select s.emp\_no, e.gender, datename (year, s.from\_date) as Year, s.from\_date, s.to\_date, d.dept\_name

from salaries s

inner join dept\_emp de

on s.emp\_no=de.emp\_no

inner join employees e

on de.emp\_no=e.emp\_no

inner join departments d

on d.dept\_no=de.dept\_no

WHERE datename (year, s.from\_date)=1985 or datename (year, s.from\_date)=2001

)

select Year, dept\_name, gender, count (gender) as 'Gender'

from subquery

group by dept\_name, Year, gender

order by year, dept\_name, subquery.gender;

**Result:**

1985 Customer Service F 17

1985 Customer Service M 17

1985 Development F 71

1985 Development M 106

1985 Finance F 21

1985 Finance M 21

1985 Human Resources F 13

1985 Human Resources M 24

1985 Marketing F 12

1985 Marketing M 19

1985 Production F 66

1985 Production M 93

1985 Quality Management F 14

1985 Quality Management M 28

1985 Research F 12

1985 Research M 20

1985 Sales F 44

1985 Sales M 69

2001 Customer Service F 305

2001 Customer Service M 403

2001 Development F 995

2001 Development M 1537

2001 Finance F 210

2001 Finance M 303

2001 Human Resources F 198

2001 Human Resources M 354

2001 Marketing F 224

2001 Marketing M 338

2001 Production F 891

2001 Production M 1334

2001 Quality Management F 236

2001 Quality Management M 335

2001 Research F 226

2001 Research M 353

2001 Sales F 664

2001 Sales M 897

--3.3.What is the average salary of women and men in 2001 compared to 1985 in the company?

WITH subquery AS(

select '1985' as Year, s.salary,e.gender

from salaries s

INNER JOIN employees e

ON s.emp\_no = e.emp\_no

WHERE s.from\_date < '1986-01-01'

UNION ALL

select '2001' as Year, s.salary, e.gender

from salaries s

INNER JOIN employees e

ON s.emp\_no = e.emp\_no

WHERE s.from\_date between '2001-01-01' and '2001-12-31'

)

select Year,gender, cast (AVG (salary) as decimal(16,2)) as 'Avg Salary'

from subquery

group by Year, gender

order by year,subquery.gender;

**Result:**

**1985 F 54696.89**

**1985 M 54418.69**

**2001 F 70810.26**

**2001 M 70576.42**

--3.4.What is the average salary of women and men in 2001 compared to 1985 by department?

WITH subquery AS (

select s.emp\_no, s.salary, e.gender, datename (year, s.from\_date) as Year, s.from\_date, s.to\_date, d.dept\_name

from salaries s

inner join dept\_emp de

on s.emp\_no=de.emp\_no

inner join employees e

on de.emp\_no=e.emp\_no

inner join departments d

on d.dept\_no=de.dept\_no

WHERE (datename (year, s.from\_date)=1985 or datename (year, s.from\_date)=2001) and s.from\_date >=de.from\_date AND s.from\_date< de.to\_date

)

select Year, dept\_name, gender, cast (AVG (salary) as decimal(16,2)) as 'Avg Salary'

from subquery

group by Year, dept\_name, gender

order by year, dept\_name, subquery.gender;

**Result:**

1985 Customer Service F 43023.18

1985 Customer Service M 44088.35

1985 Development F 53177.51

1985 Development M 49988.93

1985 Finance F 61474.05

1985 Finance M 64385.48

1985 Human Resources F 48974.00

1985 Human Resources M 45027.92

1985 Marketing F 58078.67

1985 Marketing M 65792.37

1985 Production F 50221.12

1985 Production M 49082.58

1985 Quality Management F 47032.00

1985 Quality Management M 47279.36

1985 Research F 48396.92

1985 Research M 52894.65

1985 Sales F 70063.55

1985 Sales M 71401.07

2001 Customer Service F 65883.51

2001 Customer Service M 65445.74

2001 Development F 66499.01

2001 Development M 66197.65

2001 Finance F 75767.00

2001 Finance M 76587.27

2001 Human Resources F 62529.20

2001 Human Resources M 62876.23

2001 Marketing F 77361.42

2001 Marketing M 79355.71

2001 Production F 66498.44

2001 Production M 66667.56

2001 Quality Management F 66089.02

2001 Quality Management M 64641.21

2001 Research F 66631.27

2001 Research M 68022.10

2001 Sales F 87141.26

2001 Sales M 87119.77

Task 4. How about employee churn in 2001 (only)

* What does employee churn look like when you consider the various departments. Note the “to\_date” in the dept\_emp indicates that an employee has left that department e.g. 9999-01-01 indicates the employee is still within the department.

Churn = #employees leaving in given yr / total employees in the dept in given yr

* What conclusions can you draw?
* In 2001, are particular departments more susceptible to churn

What conclusions can do then draw from the analysis? Once again consider the recommendations that you would make to the CEO. Are particular department more susceptible to churn?

--4.1. Calculate employee churn by department.

SELECT dept\_name,

SUM(CASE WHEN YEAR(to\_date) = 2001 THEN 1 ELSE 0 END) AS churned,

cast(SUM(CASE WHEN YEAR(to\_date) = 2001 THEN 1 ELSE 0 END) \* 1.0/ NULLIF(SUM(COUNT(to\_date)) OVER (PARTITION BY dept\_name), 0)as decimal(6,5)) AS Churn

FROM (

SELECT d.dept\_name, de.to\_date

FROM dept\_emp de

INNER JOIN departments d ON de.dept\_no = d.dept\_no

WHERE YEAR(de.to\_date) > 2000 and YEAR(de.from\_date)<2002

) AS subquery

GROUP BY dept\_name

ORDER BY dept\_name;

**Result:**

Customer Service 28 0.03774

Development 99 0.03827

Finance 17 0.03250

Human Resources 19 0.03381

Marketing 21 0.03621

Production 94 0.04128

Quality Management 15 0.02547

Research 25 0.04188

Sales 63 0.03955

**Remarks**

1. In the database, the employees table does not have up-to-date Hire\_date data and needs to be updated. 1380 employees did not receive a salary as of January 01, 1987, 5903 employees worked for many years without a salary.

2. In the database table Salaries, it is necessary to enter data on the payment of salaries in accordance with accounting and legislation, namely at least once a month and also when a department employee changes. It is also desirable to add a dept\_no column to the salaries table in the database