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Lab 6
Aggregate Functions

1.

```
1 •  select max(gpa) as Max, min(gpa) as Min
2    from Student s join Apply a on s.sID = a.sID
3    where major = 'CS';
4
5 •  select max(gpa) - min(gpa) as Spread
6    from Student s join Apply a on s.sID = a.sID
7    where major = 'CS';
8
9
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

| | Max | Min |
|---|---|---|
| ▶ | 3.9 | 3.4 |

2.

```
5 •  select max(gpa) - min(gpa) as Spread
6    from Student s join Apply a on s.sID = a.sID
7    where major = 'CS';
8
9
```

Result Grid | Filter Rows: | Export: | Wrap Cell

| | Spread |
|---|---|
| ▶ | 0.5 |

```
9  select sName, cName, major, min(gpa), max(gpa)
10 from Student s join Apply a on s.sID = a.sID
11 group by cName, major;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Conten

| sName | cName | major | min(gpa) | max(gpa) |
|---|---|---|---|---|
| Amy | Stanford | CS | 3.7 | 3.9 |
| Amy | Stanford | EE | 3.9 | 3.9 |
| Amy | Berkeley | CS | 3.7 | 3.9 |
| Amy | Cornell | EE | 3.5 | 3.9 |
| Bob | Berkeley | biology | 3.6 | 3.6 |
| Craig | MIT | bioengineering | 3.5 | 3.5 |
| Craig | Cornell | bioengineering | 3.5 | 3.5 |
| Craig | Cornell | CS | 3.5 | 3.5 |
| Fay | Stanford | history | 2.9 | 3.8 |
| Irene | MIT | biology | 3.9 | 3.9 |
| Irene | MIT | marine biology | 3.9 | 3.9 |
| Jay | Cornell | history | 2.9 | 2.9 |
| Jay | Cornell | psychology | 2.9 | 2.9 |
| Craig | MIT | CS | 3.4 | 3.4 |

Result 10

3.

```
13 select state, sum(enrollment)
14 from college
15 group by state;
```

Result Grid | Filter Rows: | Exp

| state | sum(enrollment) |
|---|---|
| CA | 51000 |
| MA | 10000 |
| NY | 21000 |

4.

5.

```
17  select avg(gpa) as Average_GPA
18  from Student s join Apply a on s.sID = a.sID
19  where major = 'CS';
```

Result Grid | Filter Rows: | Export: | Wrap

| Average_GPA |
| --- |
| 3.714285714285714 |

6.

```
21  select distinct (select avg(GPA) as avgGPA from Student
22          where sID in (
23              select sID from Apply where major = 'CS')) -
24         (select avg(GPA) as avgGPA from Student
25          where sID not in (
26              select sID from Apply where major = 'CS')) as d
27      from Student;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

| d |
| --- |
| 0.19428571428571573 |

7.

```
28
29 •  select count(*)
30    from Student;
31
32 •  SELECT COUNT(DISTINCT
33    WHERE cName LIKE 'Cor
```

Result Grid | Filter Rows:

| | count(*) |
|---|---|
| ▶ | 12 |

8.

```
32 •  SELECT COUNT(DISTINCT sID) FROM Apply
33    WHERE cName LIKE 'Cornell';
```

Result Grid | Filter Rows: | Export: | Wrap Cel

| | COUNT(DISTINCT sID) |
|---|---|
| ▶ | 3 |

```
35 •  select sid, count(distinct cname)
36    from Apply
37    group by sid;
```

Result Grid | Filter Rows: | Export:

| sid | count(distinct cname) |
|---|---|
| 123 | 3 |
| 234 | 1 |
| 345 | 2 |
| 543 | 1 |
| 678 | 1 |
| 765 | 2 |
| 876 | 2 |
| 987 | 2 |

9.

```
39 •  select sname, s.sid, count(distinct cname)
40    from Apply a join Student s on a.sid = s.sid
41    group by sname;
```

Result Grid | Filter Rows: | Export: | Wrap Cell

| sname | sid | count(distinct cname) |
|---|---|---|
| Amy | 123 | 3 |
| Bob | 234 | 1 |
| Craig | 345 | 2 |
| Fay | 678 | 1 |
| Helen | 987 | 2 |
| Irene | 876 | 2 |
| Jay | 765 | 2 |

```
47 •  Select cName
48    from Apply
49    Group By cName
50    having count(*) < 5;
```

Result Grid | Filter Rows:

| cName |
| --- |
| Berkeley |
| MIT |

10.

```
59 •  SELECT count(*)
60        FROM Student;
61
62
```

Result Grid | Filter Rows:

| count(*) |
| --- |
| 14 |

11.

```
61
62 •  SELECT count(GPA)
63        FROM Student;
```

Result Grid | Filter Rows:

| count(GPA) |
| --- |
| 12 |

It is different because count does not add null values to the count

12.

```
59 •    SELECT count(*)
60              FROM Student;
61
62 •    SELECT count(GPA)
63              FROM Student;
64
```

Result Grid | Filter Rows:

| count(GPA) |
| --- |
| 12 |


```
59 •    SELECT count(*)
60              FROM Student;
61
62 •    SELECT count(GPA)
63              FROM Student;
64
```

Result Grid | Filter Rows:

| count(GPA) |
| --- |
| 12 |


It deleted the values where the gpa was null