



# HOMEWORK 3

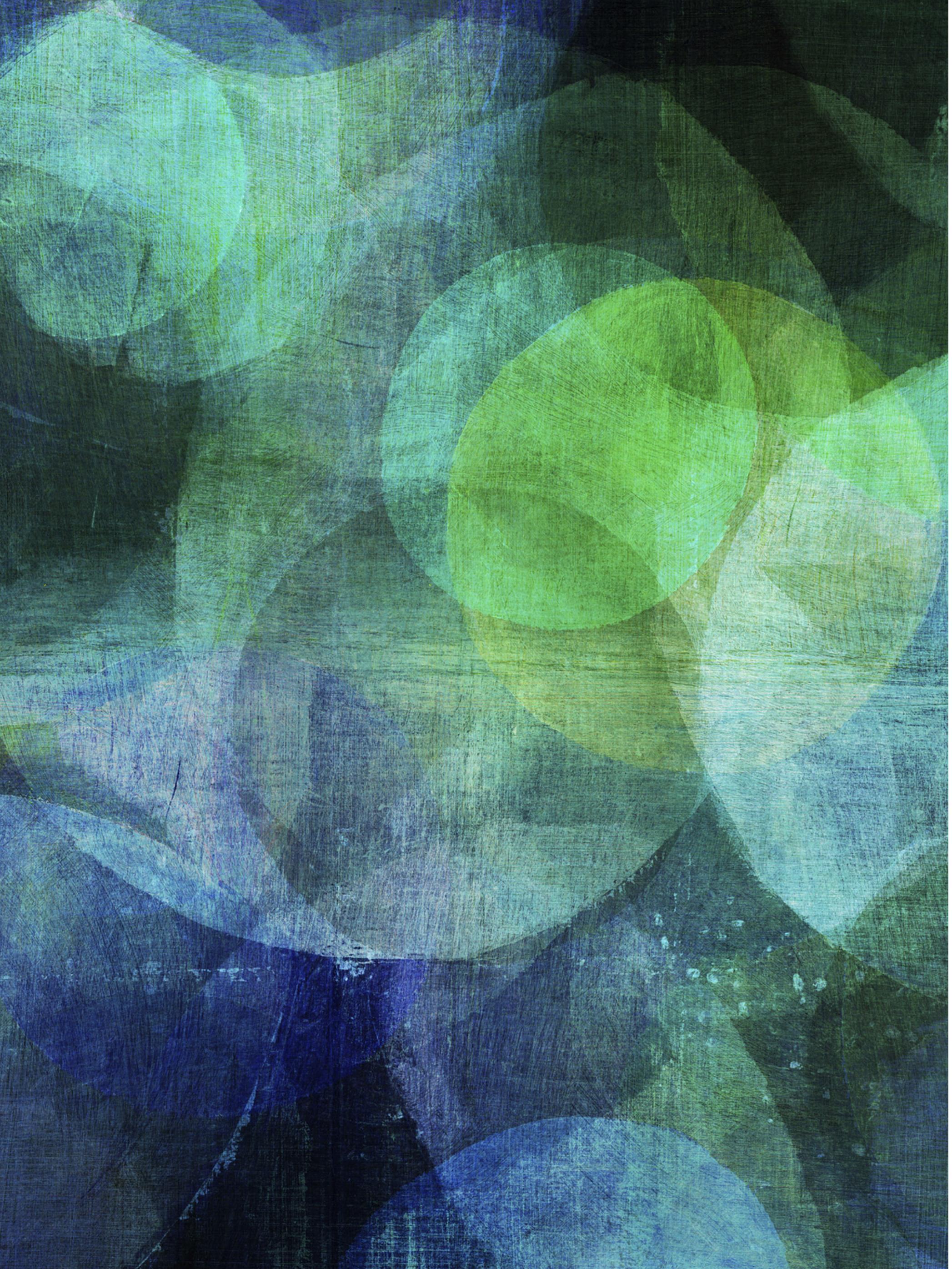
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EPPS 6354  
*Olivia Wilson-Pietrzak*

# QUESTION 2

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- Write SQL codes to get a list of:*
- i. Students IDs (hint: from the takes relation)*
  - ii. Instructors*
  - iii. Departments*



## I. STUDENT IDS

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- SELECT DISTINCT ID FROM STUDENT

## II. INSTRUCTORS

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- SELECT DISTINCT ID, NAME FROM INSTRUCTOR

## III. DEPARTMENTS

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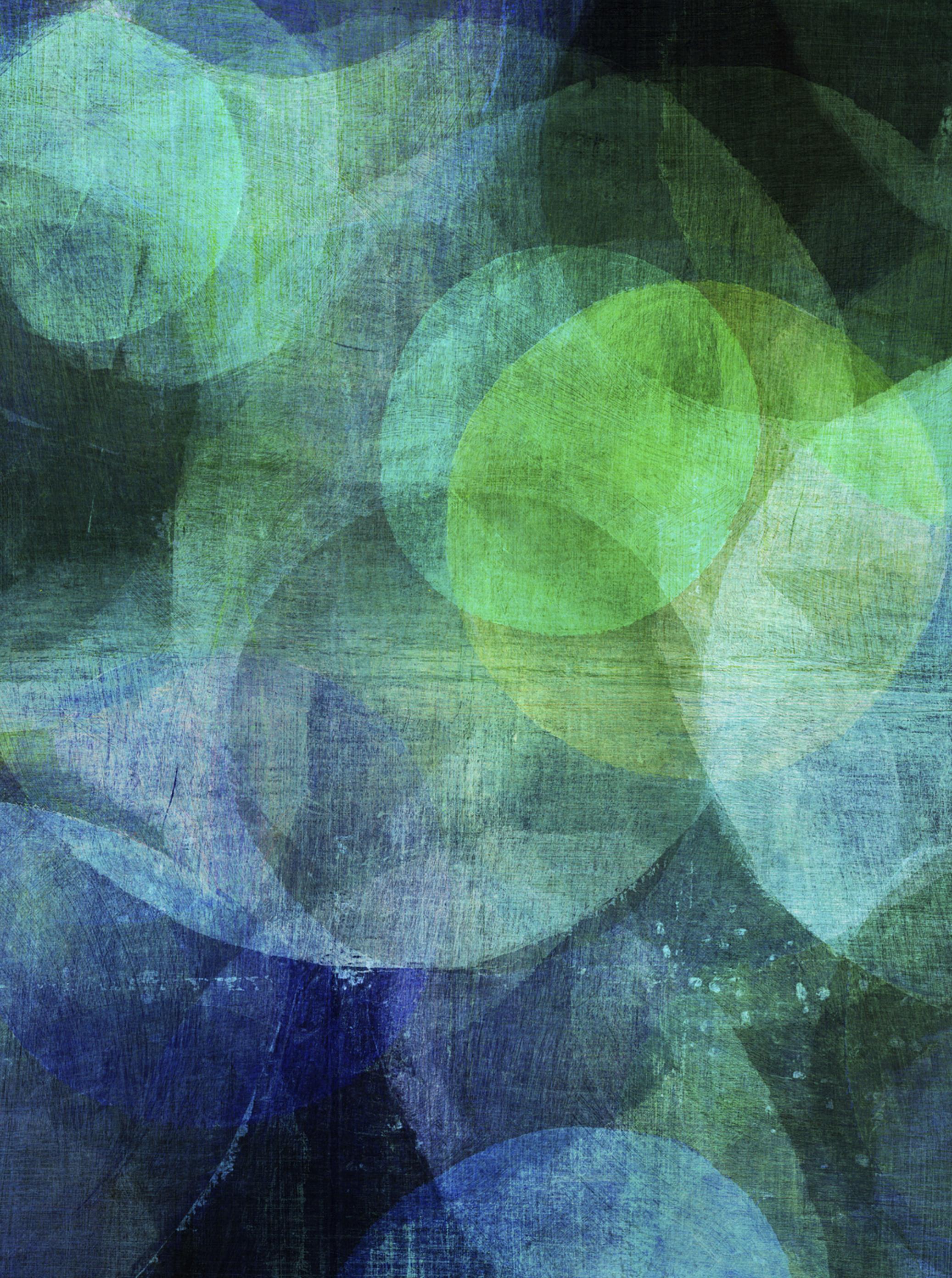
- SELECT DISTINCT DEPT\_NAME FROM DEPARTMENT

# QUESTION 3

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*Write in SQL codes to do following queries:*

- i. *Find the ID and name of each student who has taken at least one Comp. Sci. course; make sure there are no duplicate names in the result.*
- ii. *Add grades to the list*
- iii. *Find the ID and name of each student who has not taken any course offered before 2017.*
- iv. *For each department, find the maximum salary of instructors in that department. You may assume that every department has at least one instructor.*
- v. *Find the lowest, across all departments, of the per-department maximum salary computed by the preceding query.*
- vi. *Add names to the list*



| & ||

```

select
    aa.id,
    aa.name
from
    (select distinct
        a.id,
        name,
        course_id
    from
        student a
    left join
        takes b
    on
        a.id = b.id
    ) aa
inner join
    course bb
on
    aa.course_id = bb.course_id
and
    bb.dept_name = 'Comp. Sci.'

```

```

select
    aa.id,
    aa.name,
    aa.course_id,
    aa.grade
from
    (select distinct
        a.id,
        name,
        course_id,
        grade
    from
        student a
    left join
        takes b
    on
        a.id = b.id
    ) aa
inner join
    course bb
on
    aa.course_id = bb.course_id
and
    bb.dept_name = 'Comp. Sci.'
;
```

<b>id</b>	<b>name</b>	<b>course_id</b>	<b>grade</b>
00128	Zhang	CS-101	A
00128	Zhang	CS-347	A-
12345	Shankar	CS-101	C
12345	Shankar	CS-190	A
12345	Shankar	CS-315	A
12345	Shankar	CS-347	A
45678	Levy	CS-101	F
45678	Levy	CS-101	B+
45678	Levy	CS-319	B
54321	Williams	CS-101	A-
54321	Williams	CS-190	B+
76543	Brown	CS-101	A
76543	Brown	CS-319	A
98765	Bourikas	CS-101	C-
98765	Bourikas	CS-315	B

|||

```
select
aa.id,
bb.name
from
(select distinct
id
from student a
except
select distinct
id
from takes b
where
year < 2017) aa
left join
student bb
on
aa.id = bb.id;
```

<b>id</b>	<b>name</b>
00128	Zhang
12345	Shankar
19991	Brandt
23121	Chavez
44553	Peltier
45678	Levy
54321	Williams
55739	Sanchez
70557	Snow
76543	Brown
76653	Aoi
98765	Bourikas
98988	Tanaka

# IV & V

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```
select
    dept_name
    ,max(salary) max_salary
from
    instructor
group by
    dept_name
```

dept_name	max_salary
Biology	72000
Comp. Sci.	92000
Elec. Eng.	80000
Finance	90000
History	62000
Music	40000
Physics	95000

```
select
    dept_name
    , min(max_salary) lowest_of_the_highest
from
(select
    dept_name
    ,max(salary) max_salary
from
    instructor
group by
    dept_name
) aa
```

dept_name	lowest_of_the_highest
Music	40000

## VI

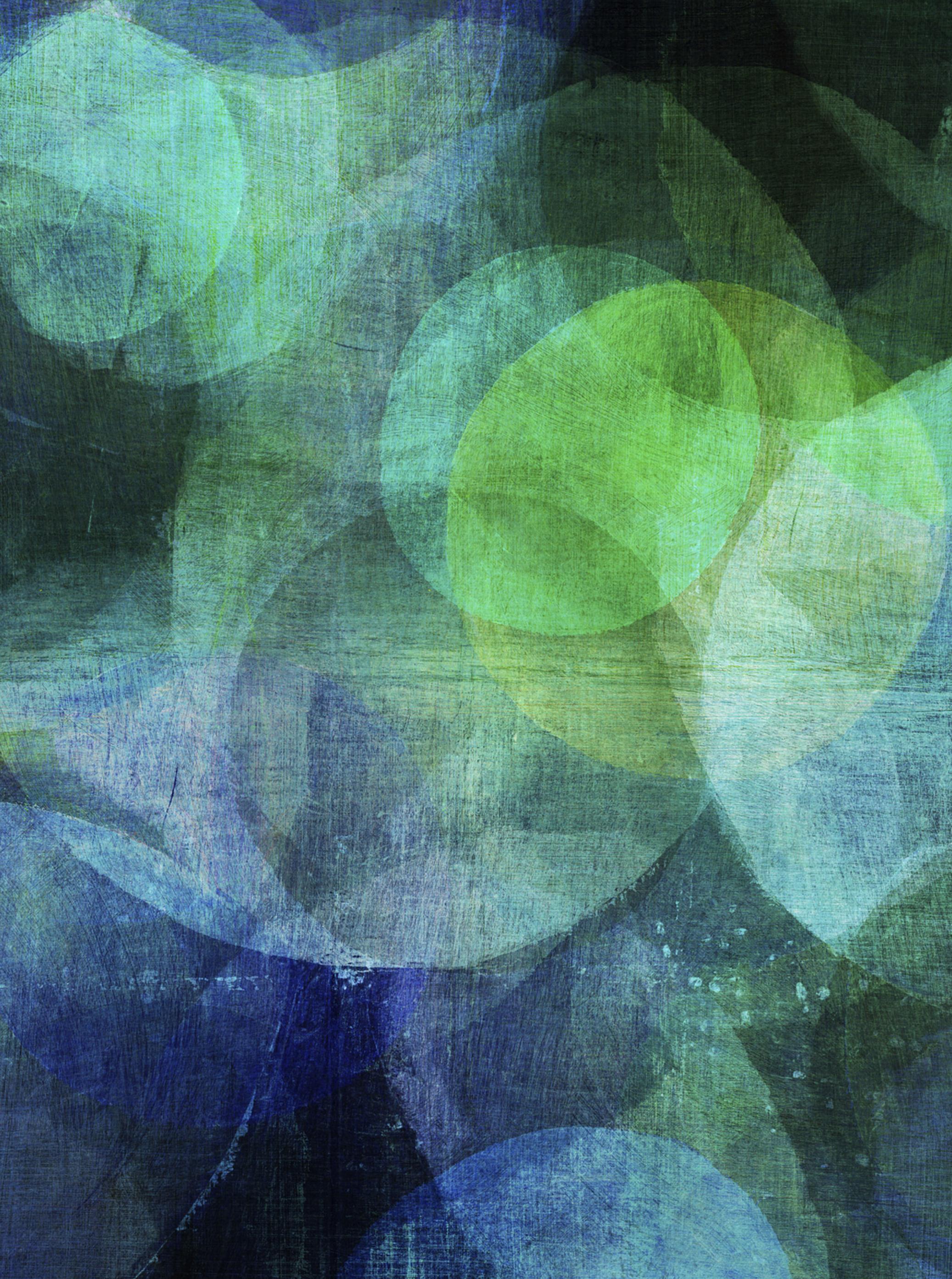
```
SELECT
    dept_name,
    name,
    MIN(max_salary) AS lowest_of_the_highest
FROM
    (SELECT
        dept_name,
        name,
        MAX(salary) AS max_salary
    FROM
        instructor
    GROUP BY
        dept_name, name
    ) AS aa
GROUP BY
    dept_name;
```

dept_name	name	lowest_of_the_highest
Biology	Crick	72000
Comp. Sci.	Srinivasan	65000
Elec. Eng.	Kim	80000
Finance	Singh	80000
History	El Said	60000
Music	Mozart	40000
Physics	Gold	87000

# QUESTION 4

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*Find instructor (with name and ID) who has never given an A grade in any course she or he has taught. (Instructors who have never taught a course trivially satisfy this condition.)*



```

select distinct
    a.id
    , a.name
from
    instructor a
inner join
    teaches b
    on
        a.id = b.id
inner join
    takes c
    on
        b.course_id = c.course_id
        and
        c.grade <> 'A'

union

select
    no.class.id
    , name.name
(select distinct
    a.id
from
    instructor a
except
    select distinct
        b.id
from
    teaches b
) no_class
inner join
    instructor name
    on
        no_class.id = name.id

```

ID	name
10101	Srinivasan
12121	Wu
15151	Mozart
22222	Einstein
32343	El Said
45565	Katz
83821	Brandt
98345	Kim

# QUESTION 5

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*Write SQL query to find the number of students in each section. The result columns should appear in the order “courseid, secid, year, semester, num”. You do not need to output sections with 0 students.*



```

select * from
(select distinct
    course_id courseid
    , sec_id secid
    , year
    , semester
    ,count(distinct grade) num
from
    takes
group by courseid, secid, year, semester
) a
where
    num > 0

```

courseid	secid	year	semester	num
BIO-101	1	2017	Summer	1
CS-101	1	2017	Fall	5
CS-101	1	2018	Spring	1
CS-190	2	2017	Spring	2
CS-315	1	2018	Spring	2
CS-319	1	2018	Spring	1
CS-319	2	2018	Spring	1
CS-347	1	2017	Fall	2
EE-181	1	2017	Spring	1
FIN-201	1	2018	Spring	1
HIS-351	1	2018	Spring	1
MU-199	1	2018	Spring	1
PHY-101	1	2017	Fall	1