ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ATHENS UNIVERSITY OF ECONOMICS & BUSINESS

DEPARTMENT OF MANAGEMENT, SCIENCE & TECHNOLOGY

MSc BUSINESS ANALYTICS

"E-Properties Property – Valuation – Valuator Relational Database"

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&

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ATHENS, 2021

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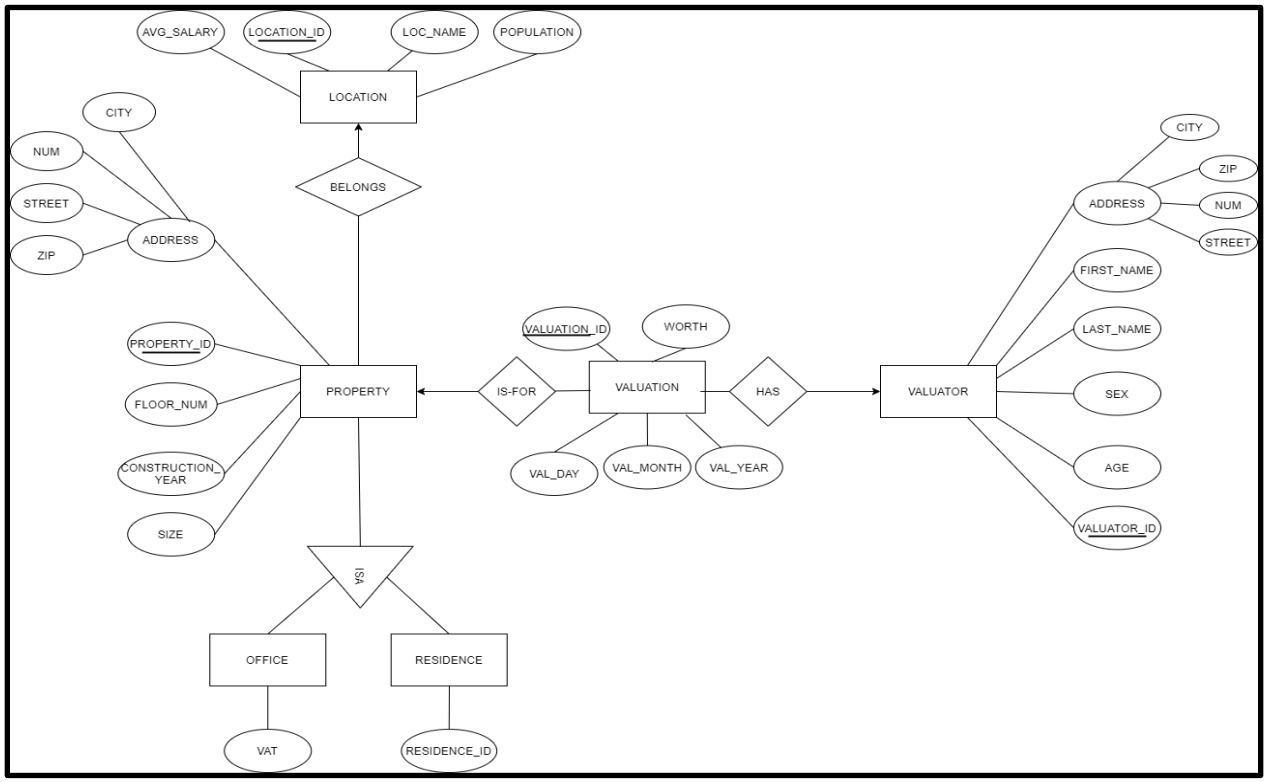
1) ER DIAGRAM & RELATIONAL MODEL



PROPERTY (PROPERTY_ID, CONSTRUCTION_YEAR, SIZE, CITY, STREET, NUM, ZIP, FLOOR_NUM, LOCATION_ID)

OFFICE (PROPERTY_ID, VAT)

RESIDENCE (PROPERTY_ID, RESIDENCE_ID)

LOC (LOCATION_ID, LOC_NAME, POPULATION, AVG_SALARY)

VALUATION (VALUATION_ID, WORTH, VAL_DAY, VAL_MONTH, VAL_YEAR, PROPERTY_ID, VALUATOR_ID)

VALUATOR (VALUATOR_ID, FIRST_NAME, LAST_NAME, AGE, SEX, CITY, STREET, NUM, ZIP)

2) TABLE CREATION

```
-- Create table loc
CREATE TABLE e_properties.loc (
location_id VARCHAR(45) NOT NULL,
loc_name VARCHAR(45) NOT NULL,
population INT,
avg_salary FLOAT,
PRIMARY KEY (location_id));
```

```
-- Create table property
CREATE TABLE e_properties.property (
property_id INT NOT NULL,
construction_year INT,
size FLOAT,
city VARCHAR(45),
street VARCHAR(45),
num INT,
zip VARCHAR(10),
floor_num INT,
location_id VARCHAR(45) NOT NULL,
PRIMARY KEY (property_id),
FOREIGN KEY (location_id)
REFERENCES e_properties.loc (location_id));
```

```
-- Create table office
CREATE TABLE e_properties.office (
property_id INT NOT NULL,
vat INT,
PRIMARY KEY (property_id),
FOREIGN KEY (property_id)
REFERENCES e_properties.property (property_id));
```

```
-- Create table residence
CREATE TABLE e_properties.residence (
property_id INT NOT NULL,
residence_id VARCHAR(15),
PRIMARY KEY (property_id),
FOREIGN KEY (property_id)
REFERENCES e_properties.property (property_id));
```

```
-- Create table valuator
CREATE TABLE e_properties.valuator (
valuator_id VARCHAR(45) NOT NULL,
first_name VARCHAR(45) NOT NULL,
last_name VARCHAR(45) NOT NULL,
age INT,
sex VARCHAR(1),
city VARCHAR(45),
street VARCHAR(45),
num INT,
zip VARCHAR(10),
PRIMARY KEY (valuator_id));
```

```
-- Create table valuation
CREATE TABLE e_properties.valuation (
valuation_id INT NOT NULL,
worth FLOAT,
val_day INT,
val_month INT,
val_year INT,
property_id INT,
valuator_id VARCHAR(45),
PRIMARY KEY (valuation_id),
FOREIGN KEY (property_id)
REFERENCES e_properties.property (property_id),
FOREIGN KEY (valuator_id)
REFERENCES e_properties.valuator (valuator_id));
```

3) DATA INSERTION

```
-- inserting values into table loc

INSERT INTO loc VALUES ('ATH', 'ATHENS', 3820000,  39640);

INSERT INTO loc VALUES ('THE', 'THESSALONIKI', 815000,  24202);

INSERT INTO loc VALUES ('PAT', 'PATRAS', 372056,  27855);

INSERT INTO loc VALUES ('ION', 'IOANNINA', 129460,  45670);

INSERT INTO loc VALUES ('IRA', 'IRAKLEIO', 123700,  51042);

INSERT INTO loc VALUES ('CHA', 'CHANIA', 65045,  12050);

INSERT INTO loc VALUES ('SAM', 'SAMOS', 25564,  9089);

INSERT INTO loc VALUES ('VOL', 'VOLOS', 73050,  41030);

INSERT INTO loc VALUES ('KAL', 'KALAMATA', 84060,  32145);

INSERT INTO loc VALUES ('COR', 'CORFU', 45678,  17867);
```

```
-- insert values into table property

INSERT INTO property VALUES ('100', 1996, 120, 'ATHENS', 'PATISION', 146,'41944', 5, 'ATH');

INSERT INTO property VALUES ('101', 2008, 50, 'ATHENS', 'ERMOU', 76, '10563', 7, 'ATH');

INSERT INTO property VALUES ('102', 1985, 110, 'THESSALONIKI', 'AGIOU DIMIITRIOU', 16, '14503', 1,
'THE');

INSERT INTO property VALUES ('103', 2013, 30, 'PATRAS', 'GOUNARI', 312, '27704', 4, 'PAT');

INSERT INTO property VALUES ('104', 1980, 54, 'PATRAS', 'KARAISKAKI', 138, '27704', 2, 'PAT');

INSERT INTO property VALUES ('105', 2001, 30, 'PATRAS', 'ZAIMI', 45, '27704', 1, 'PAT');

INSERT INTO property VALUES ('106', 1985, 110, 'THESSALONIKI', 'TOYMPAS', 6, '14613', 5, 'THE');

INSERT INTO property VALUES ('107', 1979, 145, 'ATHENS', 'STADIOU', 9, '41953', 6, 'ATH');

INSERT INTO property VALUES ('108', 2017, 95, 'IOANNINA', 'TSAKALOF', 18, '45221', 1, 'ION');

INSERT INTO property VALUES ('109', 2006, 250, 'IOANNINA', 'IPEIROU', 121, '45231', 0, 'ION');

INSERT INTO property VALUES ('110', 1998, 64, 'VOLOS', 'NIKIS', 11, '38221', 3, 'VOL');

INSERT INTO property VALUES ('111', 1989, 78, 'VOLOS', 'AGIAS SOFIAS', 141, '38224', 1, 'VOL');
```

```
INSERT INTO property VALUES ('112', 1999, 140, 'IRAKLEIO', 'OTHONOS', 111, '14122', 3, 'IRA');

INSERT INTO property VALUES ('113', 2004, 120, 'IRAKLEIO', 'LEMESOU', 13, '14422', 2, 'IRA');

INSERT INTO property VALUES ('114', 2011, 38, 'IRAKLEIO', 'THERMOPILON', 79, '14122', 1, 'IRA');

INSERT INTO property VALUES ('115', 2003, 45, 'CHANIA', 'VENIZELOU', 230, '73114', 4, 'CHA');

INSERT INTO property VALUES ('116', 2009, 75, 'CORFU', 'KAPODISTRIA', 33, '49100', 1, 'COR');

INSERT INTO property VALUES ('117', 2002, 105, 'SAMOS', 'PITHAGORA', 20, '83100', 0, 'SAM');

INSERT INTO property VALUES ('118', 2016, 85, 'KALAMATA', 'PAPASTHATHOPOULOU', 24, '24100', 1,
'KAL');

INSERT INTO property VALUES ('119', 1997, 95, 'KALAMATA', 'TROIAS', 43, '24100', 4, 'KAL');
```

```
-- inserting values into table office

INSERT INTO office VALUES ('104', 456789324);

INSERT INTO office VALUES ('113', 674267182);

INSERT INTO office VALUES ('107', 849430293);

INSERT INTO office VALUES ('102', 364387424);

INSERT INTO office VALUES ('108', 978464281);
```

```
-- inserting values into table residence

INSERT INTO residence VALUES ('100', 'AK-456291');

INSERT INTO residence VALUES ('101', 'AT-623492');

INSERT INTO residence VALUES ('103', 'S-266328');

INSERT INTO residence VALUES ('105', 'AP-476765');

INSERT INTO residence VALUES ('106', 'BK-273873');

INSERT INTO residence VALUES ('109', 'AK-437831');

INSERT INTO residence VALUES ('110', 'BK-350283');

INSERT INTO residence VALUES ('111', 'BT-654021');

INSERT INTO residence VALUES ('112', 'AH-436279');

INSERT INTO residence VALUES ('114', 'KB-768332');
```

```
INSERT INTO residence VALUES ('115', 'A-234519');

INSERT INTO residence VALUES ('116', 'S-194567');

INSERT INTO residence VALUES ('117', 'AK-267589');

INSERT INTO residence VALUES ('118', 'AD-465733');

INSERT INTO residence VALUES ('119', 'BK-236282');
```

```
-- inserting values into valuator

INSERT INTO valuator VALUES ('V1', 'GIANNIS', 'PETROPOULOS', 34, 'M','ATHENS','PONTOU',29,'22778');

INSERT INTO valuator VALUES ('V2', 'ANNA', 'PAPAMARKOU', 28,
'F','THESSALONIKI','KALAMARIAS',293,'22778');

INSERT INTO valuator VALUES ('V3', 'MANOLIS', 'GERONTAKIS', 46, 'M','IRAKLEIO','KNOSOU',93,'14122');

INSERT INTO valuator VALUES ('V4', 'KATERINA', 'OIKONOMOU', 26, 'F','SAMOS','AIGAIOU',18,'83100');

INSERT INTO valuator VALUES ('V5', 'DIMITRIS', 'ZAXAROPOULOS', 41,
'M','IOANNINA','PERSEA',3,'45221');
```

```
-- inserting values into valuation

INSERT INTO valuation VALUES(500, 85000,20,12,2020,100,'V1');

INSERT INTO valuation VALUES(501, 170000,30,12,2020,101,'V1');

INSERT INTO valuation VALUES(502, 55000,4,5,2019,107,'V1');

INSERT INTO valuation VALUES(503, 67000,23,6,2019,103,'V1');

INSERT INTO valuation VALUES(504, 40000,24,6,2019,104,'V1');

INSERT INTO valuation VALUES(505, 53000,24,5,2019,105,'V1');

INSERT INTO valuation VALUES(506, 62000,12,3,2019,102,'V2');

INSERT INTO valuation VALUES(507, 68000,10,1,2019,106,'V2');

INSERT INTO valuation VALUES(508, 46000,5,12,2020,110,'V2');

INSERT INTO valuation VALUES(509, 35000,5,12,2020,111,'V2');

INSERT INTO valuation VALUES(510, 80000,29,4,2019,112,'V3');

INSERT INTO valuation VALUES(511, 110000,26,12,2020,113,'V3');
```

```
INSERT INTO valuation VALUES(512, 58000,28,12,2020,114,'V3');
INSERT INTO valuation VALUES(513, 44000,31,12,2020,115,'V3');
INSERT INTO valuation VALUES(514, 64000,21,9,2019,116,'V4');
INSERT INTO valuation VALUES(515, 59000,23,10,2020,117,'V4');
INSERT INTO valuation VALUES(516, 123000,28,12,2020,108,'V5');
INSERT INTO valuation VALUES(517, 230000,30,12,2020,109,'V5');
INSERT INTO valuation VALUES(518, 90000,13,7,2019,118,'V5');
INSERT INTO valuation VALUES(519, 59000,20,7,2020,119,'V5');
INSERT INTO valuation VALUES(520, 57500,30,11,2020,119,'V1');
INSERT INTO valuation VALUES(521, 93000,1,12,2019,118,'V1');
INSERT INTO valuation VALUES(522, 89000,23,2,2020,119,'V3');
INSERT INTO valuation VALUES(523, 130000,21,10,2019,108,'V2');
INSERT INTO valuation VALUES(524, 128000,17,6,2020,108,'V1');
INSERT INTO valuation VALUES(525, 70000,3,10,2019,116,'V5');
INSERT INTO valuation VALUES(526, 78000,24,5,2020,112,'V2');
INSERT INTO valuation VALUES(527, 47000,2,6,2019,115,'V4');
INSERT INTO valuation VALUES(528, 65000,17,9,2019,117,'V2');
INSERT INTO valuation VALUES(529, 54000,1,11,2020,103,'V4');
INSERT INTO valuation VALUES(530, 73000,23,1,2020,102,'V3');
INSERT INTO valuation VALUES(531, 38000,2,8,2019,111,'V3');
```

The final table results are:

```
SELECT * FROM loc;
```

location_id	loc_name	population	avg_salary
ATH	ATHENS	3820000	39640
CHA	CHANIA	65045	12050
COR	CORFU	45678	17867
ION	IOANNINA	129460	45670
IRA	IRAKLEIO	123700	51042
KAL	KALAMATA	84060	32145
PAT	PATRAS	372056	27855
SAM	SAMOS	25564	9089
THE	THESSALONIKI	815000	24202
VOL	VOLOS	73050	41030
NULL	NULL	NULL	NULL

loc 1

Output

Action Output

#	Time	Action	Message
1	16:14:30	SELECT * FROM loc LIMIT 0, 1000	10 row(s) returned

```
SELECT * FROM office;
```

property_id	vat
102	364387424
104	456789324
107	849430293
108	978464281
113	674267182
NULL	NULL

office 2

Output

Action Output

```
SELECT * FROM property;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

property_id	construction_year	size	city	street	num	zip	floor_num	location_id
100	1996	120	ATHENS	PATISION	146	41944	5	ATH
101	2008	50	ATHENS	ERMOU	76	10563	7	ATH
102	1985	110	THESSALONIKI	AGIOU DIMIITRIOU	16	14503	1	THE
103	2013	30	PATRAS	GOUNARI	312	27704	4	PAT
104	1980	54	PATRAS	KARAISKAKI	138	27704	2	PAT
105	2001	30	PATRAS	ZAIMI	45	27704	1	PAT
106	1985	110	THESSALONIKI	TOYMPAS	6	14613	5	THE
107	1979	145	ATHENS	STADIOU	9	41953	6	ATH
108	2017	95	IOANNINA	TSAKALOF	18	45221	1	ION
109	2006	250	IOANNINA	IPEIROU	121	45231	0	ION
110	1998	64	VOLOS	NIKIS	11	38221	3	VOL
111	1989	78	VOLOS	AGIAS SOFIAS	141	38224	1	VOL
112	1999	140	IRAKLEIO	OTHONOS	111	14122	3	IRA
113	2004	120	IRAKLEIO	LEMESOU	13	14422	2	IRA
114	2011	38	IRAKLEIO	THERMOPILON	79	14122	1	IRA
115	2003	45	CHANIA	VENIZELOU	230	73114	4	CHA
116	2009	75	CORFU	KAPODISTRIA	33	49100	1	COR
117	2002	105	SAMOS	PITHAGORA	20	83100	0	SAM
118	2016	85	KALAMATA	PAPASTHATHOPO...	24	24100	1	KAL
119	1997	95	KALAMATA	TROIAS	43	24100	4	KAL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

property 3

```
SELECT * FROM residence;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

property_id	residence_id
100	AK-456291
101	AT-623492
103	S-266328
105	AP-476765
106	BK-273873
109	AK-437831
110	BK-350283
111	BT-654021
112	AH-436279
114	KB-768332
115	A-234519
116	S-194567
117	AK-267589
118	AD-465733
119	BK-236282
NULL	NULL

residence 4

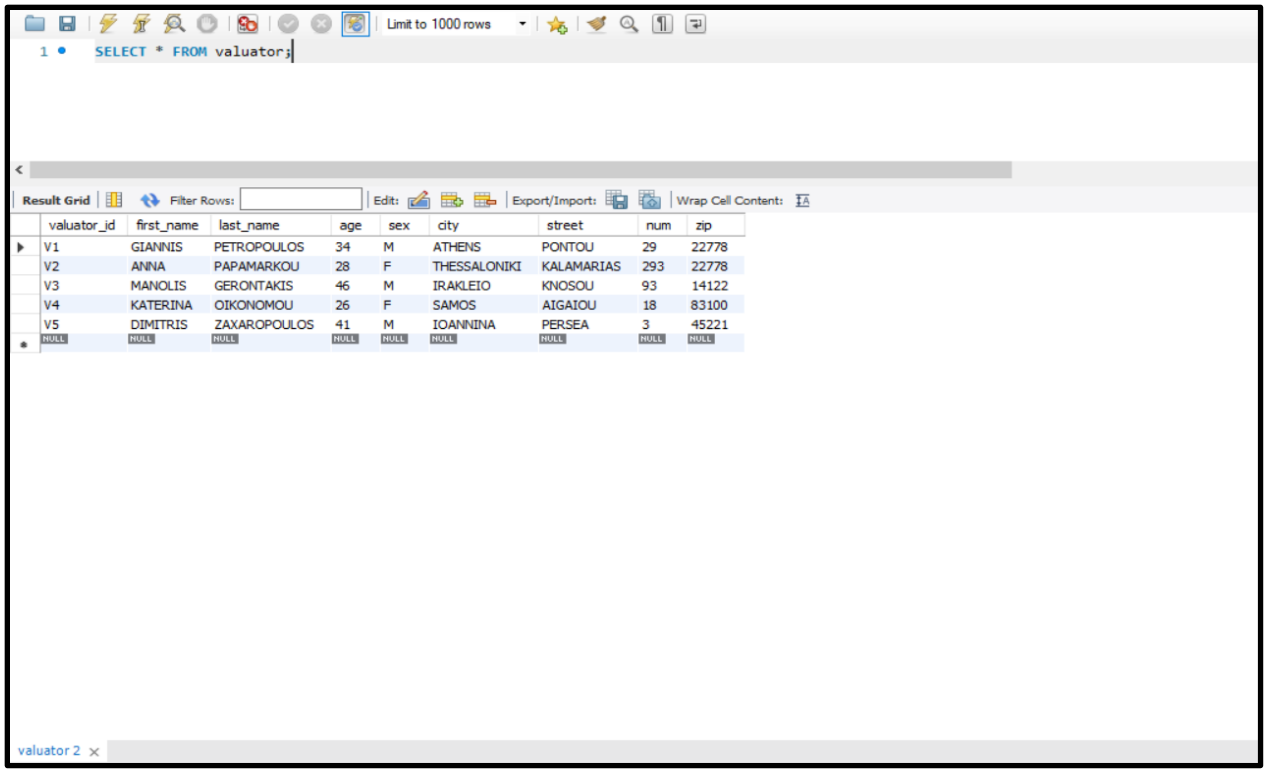
```
SELECT * FROM e_properties.valuation;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

valuation_id	worth	val_day	val_month	val_year	property_id	valuator_id
500	85000	20	12	2020	100	V1
501	170000	30	12	2020	101	V1
502	55000	4	5	2019	107	V1
503	67000	23	6	2019	103	V1
504	40000	24	6	2019	104	V1
505	53000	24	5	2019	105	V1
506	62000	12	3	2019	102	V2
507	68000	10	1	2019	106	V2
508	46000	5	12	2020	110	V2
509	35000	5	12	2020	111	V2
510	80000	29	4	2019	112	V3
511	110000	26	12	2020	113	V3
512	58000	28	12	2020	114	V3
513	44000	31	12	2020	115	V3
514	64000	21	9	2019	116	V4
515	59000	23	10	2020	117	V4
516	123000	28	12	2020	108	V5
517	230000	30	12	2020	109	V5
518	90000	13	7	2019	118	V5
519	59000	20	7	2020	119	V5
520	57500	30	11	2020	119	V1
521	93000	1	12	2019	118	V1
522	89000	23	2	2020	119	V3
523	130000	21	10	2019	108	V2
524	128000	17	6	2020	108	V1
525	70000	3	10	2019	116	V5
526	78000	24	5	2020	112	V2
527	47000	2	6	2019	115	V4
528	65000	17	9	2019	117	V2
529	54000	1	11	2020	103	V4
530	73000	23	1	2020	102	V3
531	38000	2	8	2019	111	V3
NULL	NULL	NULL	NULL	NULL	NULL	NULL

valuation 1

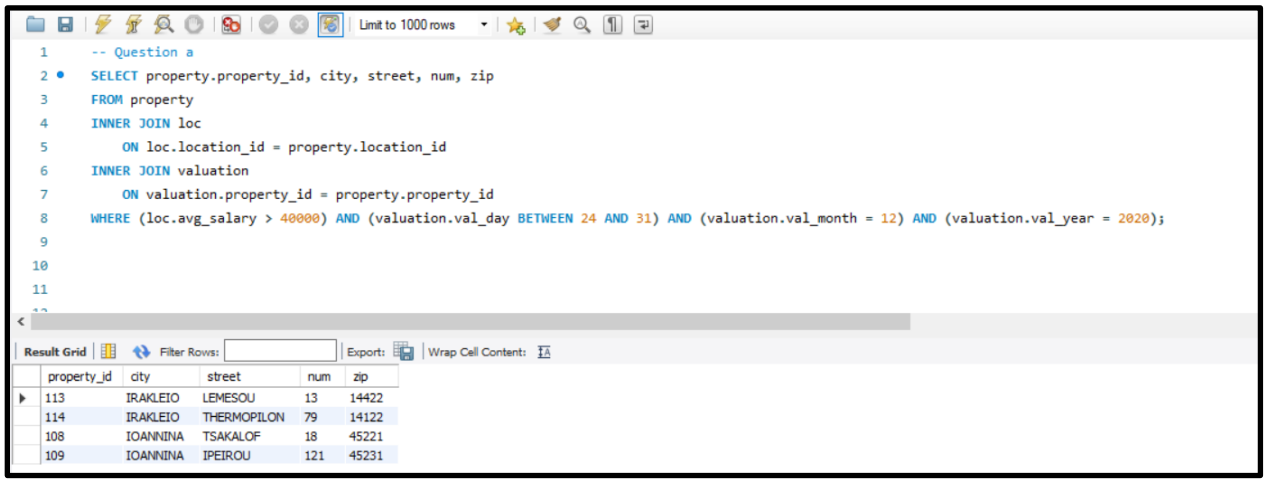
Output



valuator_id	first_name	last_name	age	sex	city	street	num	zip
V1	GIANNIS	PETROPOULOS	34	M	ATHENS	PONTOU	29	22778
V2	ANNA	PAPAMARKOU	28	F	THESSALONIKI	KALAMARIAS	293	22778
V3	MANOLIS	GERONTAKIS	46	M	IRAKLEIO	KNOSOU	93	14122
V4	KATERINA	OIKONOMOU	26	F	SAMOS	AIGAIOU	18	83100
V5	DIMITRIS	ZAXAROPOULOS	41	M	IOANNINA	PERSEA	3	45221
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

4) QUESTION ANSWERS

```
-- Question a
SELECT property.property_id, city, street, num, zip

FROM property

INNER JOIN loc

        ON loc.location_id = property.location_id

INNER JOIN valuation

        ON valuation.property_id = property.property_id

WHERE (loc.avg_salary > 40000) AND (valuation.val_day BETWEEN 24 AND 31) AND
(valuation.val_month = 12) AND (valuation.val_year = 2020);
```



property_id	city	street	num	zip
113	IRAKLEIO	LEMESOU	13	14422
114	IRAKLEIO	THERMOPILON	79	14122
108	IOANNINA	TSAKALOF	18	45221
109	IOANNINA	IPEIROU	121	45231

```
-- Question b
SELECT valuator.valuator_id, count(*) AS NUMBER_OF_VALUATIONS

FROM valuator, valuation

WHERE (valuation.valuator_id=valuator.valuator_id)

                    and valuation.val_year=2020

GROUP BY valuator.valuator_id;
```

```
13    -- Question b
14    SELECT valuator.valuator_id, count(*) AS NUMBER_OF_VALUATIONS
15    FROM valuator, valuation
16    WHERE (valuation.valuator_id=valuator.valuator_id)
17            and valuation.val_year=2020
18    GROUP BY valuator.valuator_id;
19
```

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

valuator_id	NUMBER_OF_VALUATIONS
V1	4
V2	3
V3	5
V4	2
V5	3

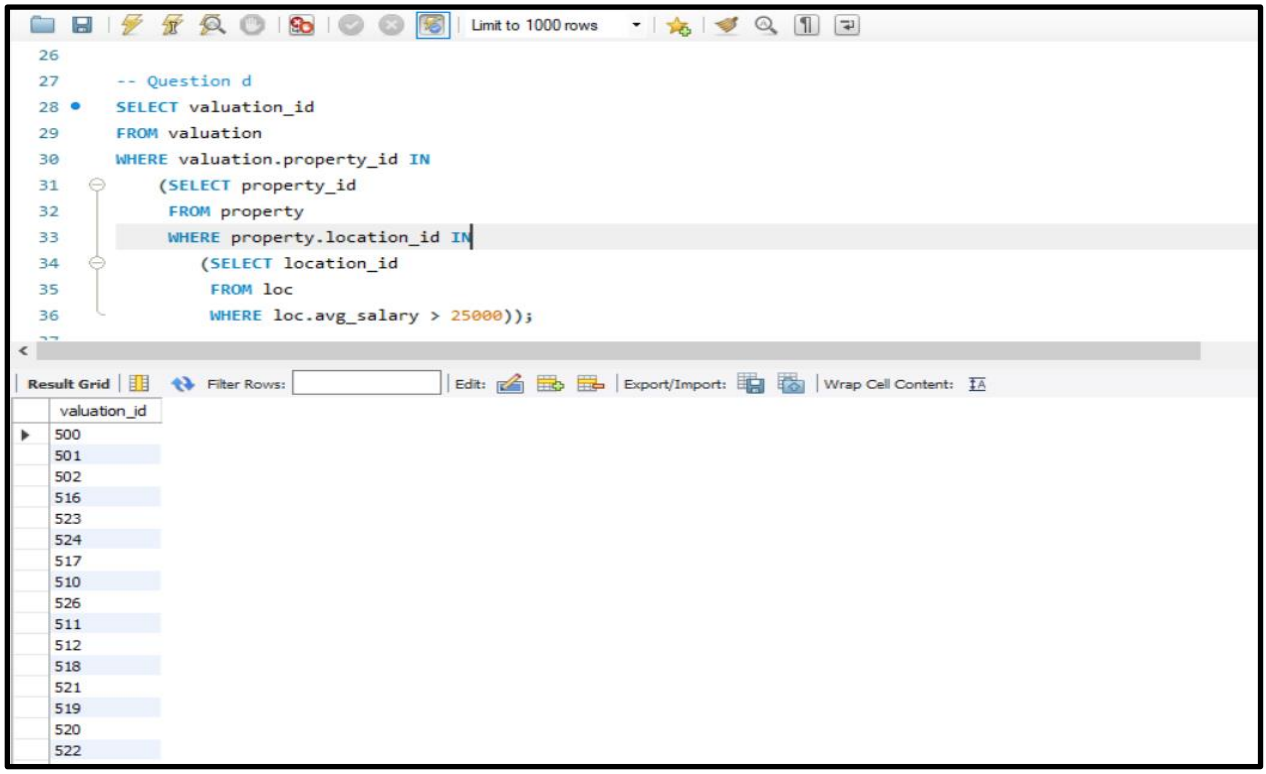
```
-- Question c
SELECT property.property_id, COUNT(valuation_id) AS 'NumVal'
FROM property
INNER JOIN valuation
        ON valuation.property_id = property.property_id
WHERE valuation.val_year = 2020
GROUP BY property.property_id
HAVING NumVal > 2;
```

```
21      -- Question c
22 •    SELECT property.property_id, COUNT(valuation_id) AS 'NumVal'
23      FROM property
24      INNER JOIN valuation
25          ON valuation.property_id = property.property_id
26      WHERE valuation.val_year = 2020
27      GROUP BY property.property_id
28      HAVING NumVal > 2;
```

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

property_id	NumVal
119	3

```
-- Question d
SELECT valuation_id

FROM valuation

WHERE valuation.property_id IN

        (SELECT property_id

         FROM property

         WHERE property.location_id IN

                (SELECT location_id

    FROM loc

    WHERE loc.avg_salary > 25000));
```



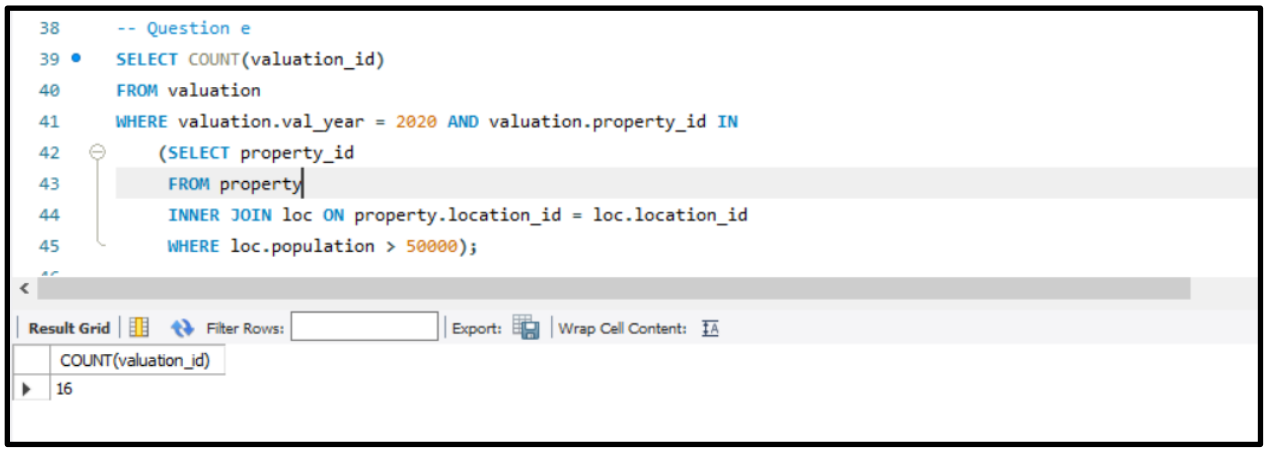
```
-- Question d
SELECT valuation_id
FROM valuation
WHERE valuation.property_id IN
    (SELECT property_id
     FROM property
     WHERE property.location_id IN
        (SELECT location_id
         FROM loc
         WHERE loc.avg_salary > 25000));
```

Result Grid

valuation_id
526
511
512
518
521
519
520
522
503
529
504
505
508
509
531
NULL

valuation 10

```
-- Question e
SELECT COUNT(valuation_id)

FROM valuation

WHERE valuation.val_year = 2020 AND valuation.property_id IN

        (SELECT property_id

         FROM property

  INNER JOIN loc ON property.location_id = loc.location_id

  WHERE loc.population > 50000);
```



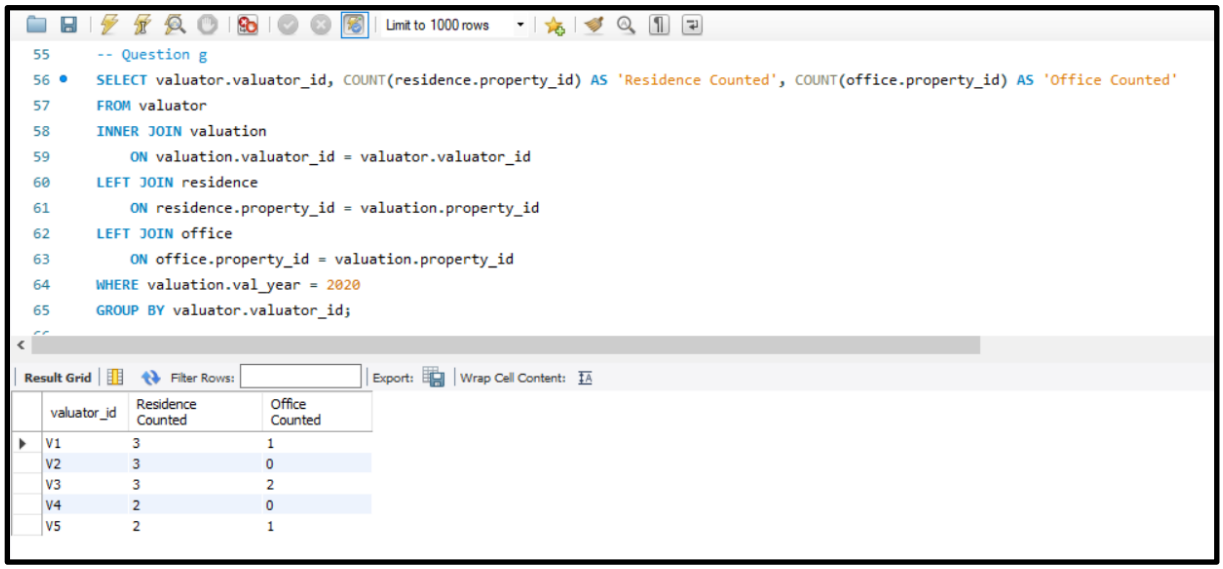
```
-- Question f
SELECT loc.location_id, AVG(valuation.worth/property.size) AS Mean_value

FROM loc, property, valuation

WHERE (property.location_id = loc.location_id)

                    AND (valuation.property_id=property.property_id)

GROUP BY loc.location_id

ORDER BY Mean_value;
```

```
47    -- Question f
48 •  SELECT loc.location_id, AVG(valuation.worth/property.size) AS Mean_value
49    FROM loc, property, valuation
50    WHERE (property.location_id = loc.location_id)
51            AND (valuation.property_id=property.property_id)
52    GROUP BY loc.location_id
53    ORDER BY Mean_value;
```

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

location_id	Mean_value
VOL	551.5491452991454
SAM	590.4761904761905
THE	615.1515151515151
KAL	863.2198142414861
IRA	892.8884711779448
COR	893.3333333333334
CHA	1011.1111111111111
ION	1232.6315789473683
ATH	1495.8812260536397
PAT	1635.1851851851852

```
-- Question g
SELECT valuator.valuator_id, COUNT(residence.property_id) AS 'Residence Counted',
COUNT(office.property_id) AS 'Office Counted'

FROM valuator

INNER JOIN valuation

        ON valuation.valuator_id = valuator.valuator_id

LEFT JOIN residence

        ON residence.property_id = valuation.property_id

LEFT JOIN office

        ON office.property_id = valuation.property_id

WHERE valuation.val_year = 2020

GROUP BY valuator.valuator_id;
```



valuator_id	Residence Counted	Office Counted
V1	3	1
V2	3	0
V3	3	2
V4	2	0
V5	2	1

```
-- Question h
CREATE VIEW AverageVal2020 AS

SELECT loc.location_id, AVG(valuation.worth/property.size) AS "AverageValSQ", valuation.val_year

FROM loc

INNER JOIN property

        ON loc.location_id = property.location_id

INNER JOIN valuation

        ON valuation.property_id = property.property_id

WHERE valuation.val_year = 2020

GROUP BY loc.location_id;


CREATE VIEW AverageVal2019 AS

SELECT loc.location_id, AVG(valuation.worth/property.size) AS "AverageValSQ"

FROM loc

INNER JOIN property

        ON loc.location_id = property.location_id

INNER JOIN valuation

        ON valuation.property_id = property.property_id

WHERE valuation.val_year = 2019

GROUP BY loc.location_id;


SELECT AverageVal2020.location_id, (AverageVal2020.AverageValSQ - AverageVal2019.AverageValSQ)
AS VarianceAverageValSQ_2020_2019

FROM AverageVal2020

INNER JOIN AverageVal2019

        ON AverageVal2020.location_id = AverageVal2019.location_id;
```

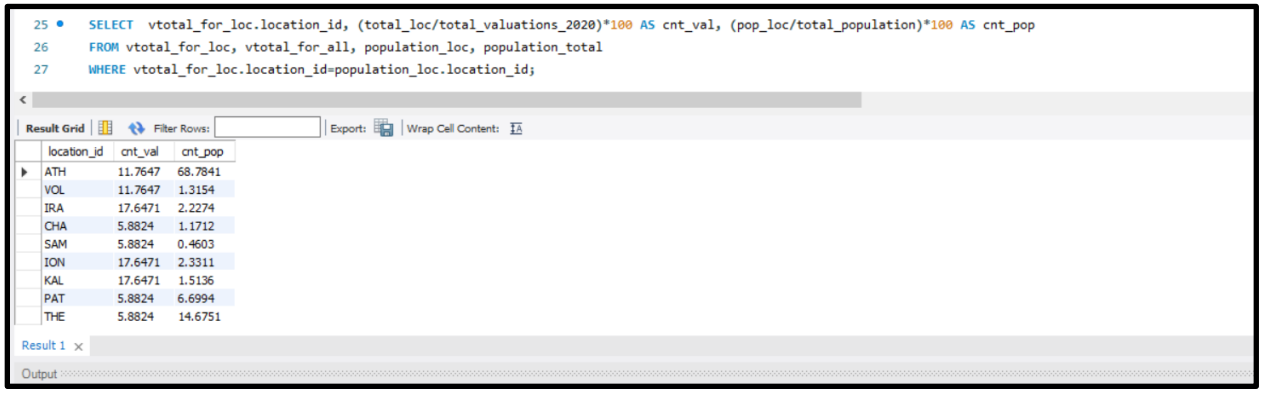
```
SELECT AverageVal2020.location_id, (AverageVal2020.AverageValSQ - AverageVal2019.AverageValSQ) AS VarianceAverageValSQ_2020_2019
FROM AverageVal2020
INNER JOIN AverageVal2019
    ON AverageVal2020.location_id = AverageVal2019.location_id;
```

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

location_id	VarianceAverageValSQ_2020_2019
ATH	1674.8563218390802
VOL	96.55448717948718
IRA	428.6131996658312
CHA	-66.66666666666652
SAM	-57.14285714285711
ION	-181.05263157894728
KAL	-355.41795665634675
PAT	219.75308641975312
THE	72.72727272727275

```
-- Question i
CREATE VIEW VTOTAL_FOR_LOC AS

SELECT loc.location_id, COUNT(valuation.valuation_id) AS total_loc

FROM loc

INNER JOIN property

        ON loc.location_id=property.location_id

INNER JOIN valuation

        ON valuation.property_id=property.property_id

WHERE valuation.val_year=2020

GROUP BY loc.location_id;


CREATE VIEW VTOTAL_FOR_ALL AS

SELECT COUNT(valuation_id) AS total_valuations_2020

FROM valuation

WHERE val_year=2020;


CREATE VIEW POPULATION_LOC AS

SELECT location_id, population AS pop_loc

FROM loc        ;
```

```
CREATE VIEW POPULATION_TOTAL AS

SELECT SUM(population) AS total_population

FROM loc;


SELECT  vtotal_for_loc.location_id, (total_loc/total_valuations_2020)*100 AS cnt_val,
(pop_loc/total_population)*100 AS cnt_pop

FROM vtotal_for_loc, vtotal_for_all, population_loc, population_total

WHERE vtotal_for_loc.location_id=population_loc.location_id;
```



```
25 •  SELECT  vtotal_for_loc.location_id, (total_loc/total_valuations_2020)*100 AS cnt_val, (pop_loc/total_population)*100 AS cnt_pop
26    FROM vtotal_for_loc, vtotal_for_all, population_loc, population_total
27    WHERE vtotal_for_loc.location_id=population_loc.location_id;
```

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

location_id	cnt_val	cnt_pop
ATH	11.7647	68.7841
VOL	11.7647	1.3154
IRA	17.6471	2.2274
CHA	5.8824	1.1712
SAM	5.8824	0.4603
ION	17.6471	2.3311
KAL	17.6471	1.5136
PAT	5.8824	6.6994
THE	5.8824	14.6751

Result 1

Output

5) PYTHON IMPLEMENTATION

```
# pip install mysql-connector-python
import mysql.connector
conn = mysql.connector.connect(
    host='localhost', user='root', passwd='*******', database='e_properties')
myCursor = conn.cursor()


def view_queries():
    view_queries_lista = []
    # Creates VIEWS via SQL queries and adds them to a list
    query1 = 'CREATE VIEW VTOTAL_FOR_LOC_5 AS\
                SELECT location_id, cnt\
                            FROM (\
                                SELECT x.location_id,\
                                    (SELECT COUNT(valuation.valuation_id)\
                                    FROM valuation\
                                    LEFT JOIN property\
                                        ON valuation.property_id =
property.property_id\
                                    WHERE x.location_id = property.location_id
AND valuation.val_year = 2020) AS cnt\
                                FROM (\
                                SELECT DISTINCT location_id FROM property INNER
JOIN valuation on valuation.property_id=property.property_id WHERE
valuation.val_year=2020) AS x) AS y'

    query2 = 'CREATE VIEW VTOTAL_FOR_ALL_5 AS\
                SELECT COUNT(valuation_id) AS total_valuations_2020\
                FROM valuation\
                WHERE val_year=2020;'

    query3 = 'CREATE VIEW POPULATION_LOC_5 AS\
                SELECT location_id, population AS pop_loc\
                FROM loc;'

    query4 = 'CREATE VIEW POPULATION_TOTAL_5 AS\
                SELECT SUM(distinct(population)) AS total_population\
                FROM loc;'

    for i in (query1, query2, query3, query4):
        view_queries_lista.append(i)
```

```
    return(view_queries_lista)


def main_query():
    # The main SQL query
    query5 = 'SELECT  vtotal_for_loc_5.location_id,
(vtotal_for_loc_5.cnt/total_valuations_2020)*100 AS cnt_val,
(pop_loc/total_population)*100 AS cnt_pop\
                FROM vtotal_for_loc_5, vtotal_for_all_5, population_loc_5,
population_total_5\
                WHERE vtotal_for_loc_5.location_id=population_loc_5.location_id;'
    return query5


def main():
    # Executes View queries
    for i in view_queries():
        myCursor.execute(i)
    # Executes main query
    myCursor.execute(main_query())
    # Prints table
    print("\nTABLE ANSWER TO QUESTION 5\n")
    for location_id, cnt_val, cnt_pop in myCursor:
        print(location_id, cnt_val, cnt_pop)


if __name__ == "__main__":
    main()
```

```
PROBLEMS    OUTPUT    TERMINAL    JUPYTER    DEBUG CONSOLE

TABLE ANSWER TO QUESTION 5

ATH 11.7647 68.7841
VOL 11.7647 1.3154
IRA 17.6471 2.2274
CHA 5.8824 1.1712
SAM 5.8824 0.4603
ION 17.6471 2.3311
KAL 17.6471 1.5136
PAT 5.8824 6.6994
THE 5.8824 14.6751
```