

Question 1

Thursday, April 15, 2021 10:19 AM

EMPLOYEE

Fname Lname Ssn Address Do b

PROJECT

Pid Name Start-date Deadline

CUSTOMER

Pid Name Address Phone

WORKS_ON

Ssn Pid

DEVELOPER

Ssn PLanguage

TESTER

Ssn TSoftware

DBA

Ssn DB Software

Question 2

Thursday, April 15, 2021

10:39 AM

CAR

<u>Vin</u>	Model	Manufacturer	Price	Option_serial_no
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↑PK

FK

OPTION

<u>Serial_no</u>	Option_name	Option_price
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PK ↑

CUSTOMER

<u>Ssn</u>	Name	Phone	Address
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↑PK

SALESPERSON

<u>Salesperson id</u>	Name	Branch
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↑PK

FK

BRANCH

<u>Branch id</u>	Branch_name	Phone	Address	Region
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PK ↑

SALE

<u>Salesperson id</u>	<u>Vin</u>	<u>Ssn</u>	Date	Sale_price
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FK

FK

FK

Question 3

Thursday, April 15, 2021 10:47 AM

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	888665555	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
888665555	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

a) Retrieve first name and last name of all employees who work on projects located in 'Houston'.

HTOWN $\leftarrow \sigma_{Plocation = 'Houston'} (PROJECT)$

HW $\leftarrow HTOWN \bowtie_{Pnumber = Pno} WORKS_ON$

SSNS $\leftarrow \pi_{Essn} (HW)$

EMPS $\leftarrow SSNS \bowtie_{Essn = Ssn} EMPLOYEE$

RESULT $\leftarrow \pi_{Fname, Lname} (EMPS)$

Fname	Lname
Ramesh	Narayan
Franklin	Wong
Jennifer	Wallace
James	Borg

b) Retrieve first name, last name and Ssn of employees who work in the 'Research' department on a project located in 'Sugarland' and whose salary is more than \$26000.

SLAND $\leftarrow \sigma_{llocation = 'sugarland'}(PROJECT)$

P2 $\leftarrow SLAND \bowtie_{Pnumber = Pno} WORKS_ON$

RESEARCH $\leftarrow \sigma_{Dname = 'Research'}(DEPARTMENT)$

RESEARCHERS $\leftarrow RESEARCH \bowtie_{Dnumber = Dno} EMPLOYEE$

P2PEOPLE $\leftarrow P2 \bowtie_{Essn = Ssn} RESEARCHERS$

RICH $\leftarrow \sigma_{salary > 28000}(P2PEOPLE)$

RESULT $\leftarrow \pi_{fname, lname, ssn}(RICH)$

fname	lname	ssn
John	Smith	123 456785
Franklin	Wong	333 445555