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Subject : Advanced Database Systems Lab

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Implement the Inheritance, Functions and Methods in OODBMS

Problem Statement

1. Create a super type person

Person: attributes -->fname (first name), lname (last name) dob (date of birth)
Methods -->FullName(to return full name), OnDate(return dob)

Create a sub type EmpObj which will inherit the person type attributes and methods.
Empobj (inherits Person): attributes --> job, sal, da(allowance), doj(date of joining)
Methods -- > Earn (return earning), OnDate(overriding return doj)

Answer below query.

1. Display employee Id, Employee Full Name, Employee Date of joining, Employee Date of Birth and Employee Earning for all employees.

Solution:

```
CREATE TYPE examtype AS OBJECT (
        year NUMBER,
        city VARCHAR2(50)
);

CREATE TYPE childtype AS OBJECT (
        name     VARCHAR2(50),
        birthday DATE
);

CREATE TYPE examset AS
    VARRAY(10) OF examtype;

CREATE TYPE skilltype AS OBJECT (
        type  VARCHAR2(50),
        exams examset
);
```

```
CREATE TYPE skillset AS
    VARRAY(10) OF skilltype;

CREATE TYPE childrenset AS
    VARRAY(10) OF childtype;

CREATE TABLE emp (
    ename    VARCHAR(50),
    children childrenset,
    skills   skillset
);

INSERT ALL INTO emp VALUES (
    'Alice Smith',
    childrenset(
        childtype(
            'John', TO_DATE('2001-05-15', 'YYYY-MM-DD')
        ), childtype(
            'Jane', TO_DATE('1998-03-22', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'typing', examset(
                examtype(
                    2023, 'Dayton'
                ), examtype(
                    2021, 'Cleveland'
                )
            )
        ), skilltype(
            'programming', examset(
                examtype(
                    2020, 'New York'
                )
            )
        )
    )
) INTO emp VALUES (
    'Bob Johnson',
    childrenset(
        childtype(
```

```
            'Mike', TO_DATE('1999-07-30', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'accounting', examset(
                examtype(
                    2019, 'Columbus'
                )
            )
        ), skilltype(
            'typing', examset(
                examtype(
                    2022, 'Dayton'
                )
            )
        )
    )
) INTO emp VALUES (
    'Charlie Brown',
    childrenset(
        childtype(
            'Sam', TO_DATE('2003-09-05', 'YYYY-MM-DD')
        ), childtype(
            'Tom', TO_DATE('2005-11-13', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'management', examset(
                examtype(
                    2018, 'Chicago'
                )
            )
        ), skilltype(
            'programming', examset(
                examtype(
                    2021, 'Boston'
                )
            )
        )
    )
) INTO emp VALUES (
```

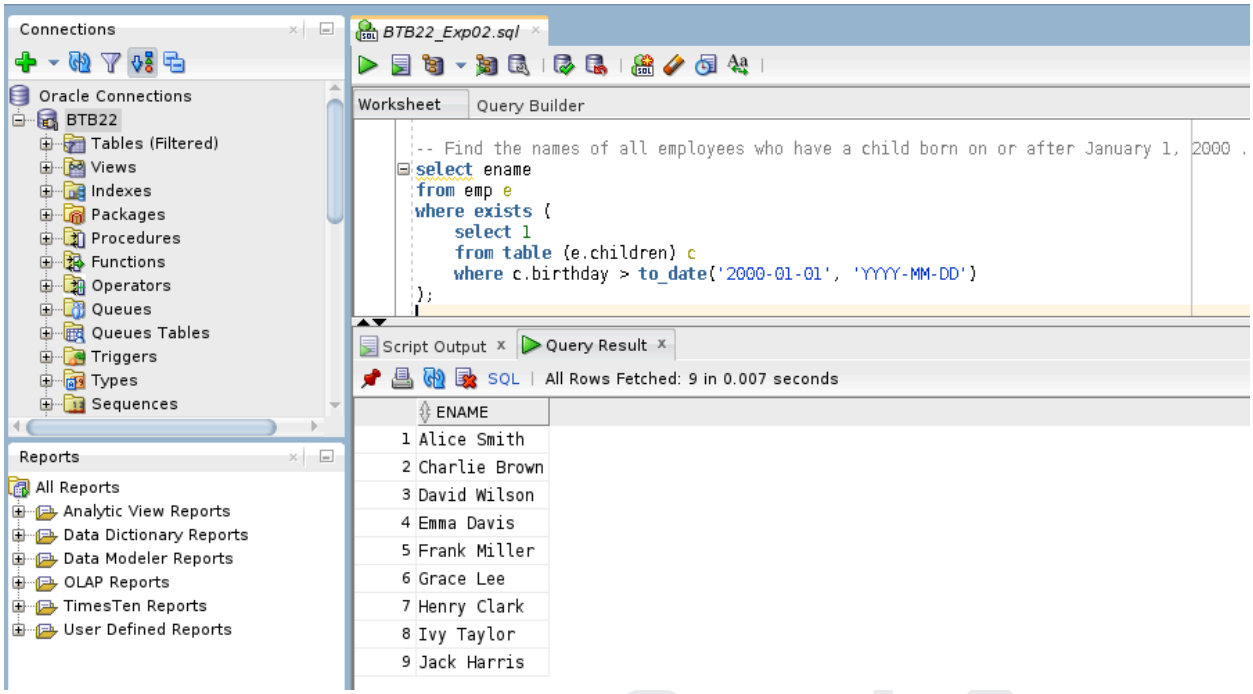
```
    'David Wilson',
    childrenset(
        childtype(
            'Lucy', TO_DATE('2000-12-25', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'typing', examset(
                examtype(
                    2023, 'Dayton'
                )
            )
        ), skilltype(
            'design', examset(
                examtype(
                    2020, 'San Francisco'
                )
            )
        )
    )
) INTO emp VALUES (
    'Emma Davis',
    childrenset(
        childtype(
            'Jake', TO_DATE('2002-02-14', 'YYYY-MM-DD')
        ), childtype(
            'Mia', TO_DATE('1997-10-19', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'data analysis', examset(
                examtype(
                    2022, 'Seattle'
                )
            )
        ), skilltype(
            'typing', examset(
                examtype(
                    2020, 'Dayton'
                )
            )
```

```
        )
    )
) INTO emp VALUES (
    'Frank Miller',
    childrenset(
        childtype(
            'Nina', TO_DATE('2004-04-22', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'programming', examset(
                examtype(
                    2019, 'Boston'
                )
            )
        ), skilltype(
            'typing', examset(
                examtype(
                    2021, 'Dayton'
                )
            )
        )
    )
) INTO emp VALUES (
    'Grace Lee',
    childrenset(
        childtype(
            'Liam', TO_DATE('2000-08-07', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'typing', examset(
                examtype(
                    2023, 'Dayton'
                )
            )
        ), skilltype(
            'management', examset(
                examtype(
                    2022, 'Chicago'
                )
```

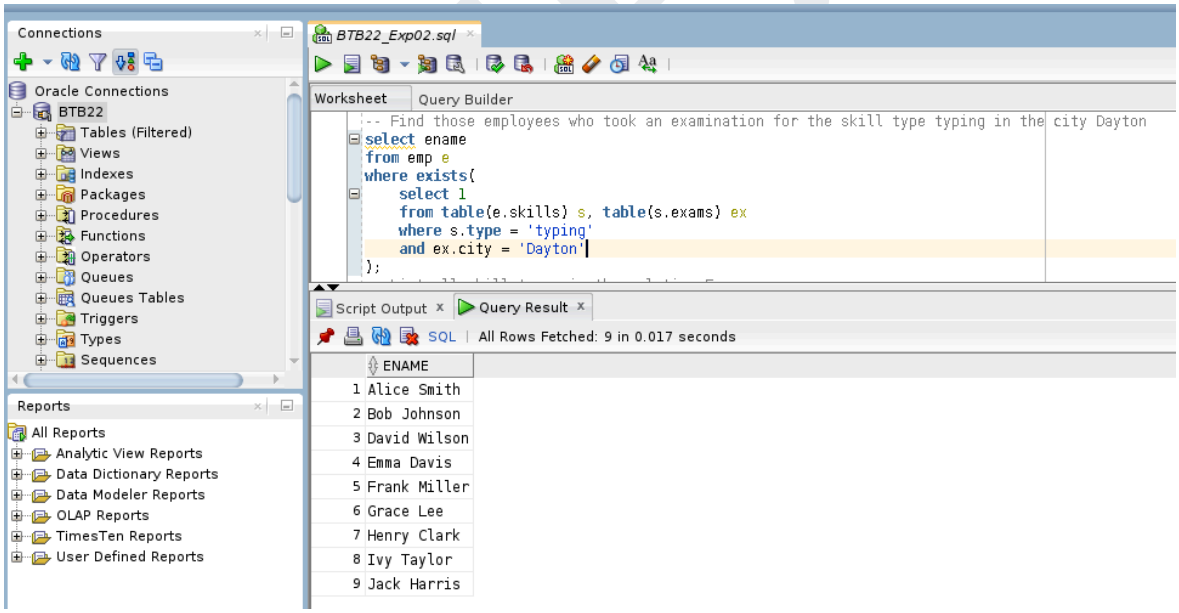
```
            )
        )
    )
) INTO emp VALUES (
    'Henry Clark',
    childrenset(
        childtype(
            'Ethan', TO_DATE('1996-01-17', 'YYYY-MM-DD')
        ), childtype(
            'Sophia', TO_DATE('2003-12-29', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'data analysis', examset(
                examtype(
                    2021, 'Los Angeles'
                )
            )
        ), skilltype(
            'typing', examset(
                examtype(
                    2022, 'Dayton'
                )
            )
        )
    )
) INTO emp VALUES (
    'Ivy Taylor',
    childrenset(
        childtype(
            'Noah', TO_DATE('2001-03-03', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'design', examset(
                examtype(
                    2020, 'New York'
                )
            )
        ), skilltype(
            'typing', examset(
```

```
                examtype(
                    2021, 'Dayton'
                )
            )
        )
    )
) INTO emp VALUES (
    'Jack Harris',
    childrenset(
        childtype(
            'Olivia', TO_DATE('2005-06-12', 'YYYY-MM-DD')
        )
    ),
    skillset(
        skilltype(
            'typing', examset(
                examtype(
                    2023, 'Dayton'
                )
            )
        ), skilltype(
            'programming', examset(
                examtype(
                    2019, 'San Francisco'
                )
            )
        )
    )
) SELECT
      *
  FROM
      dual;
```

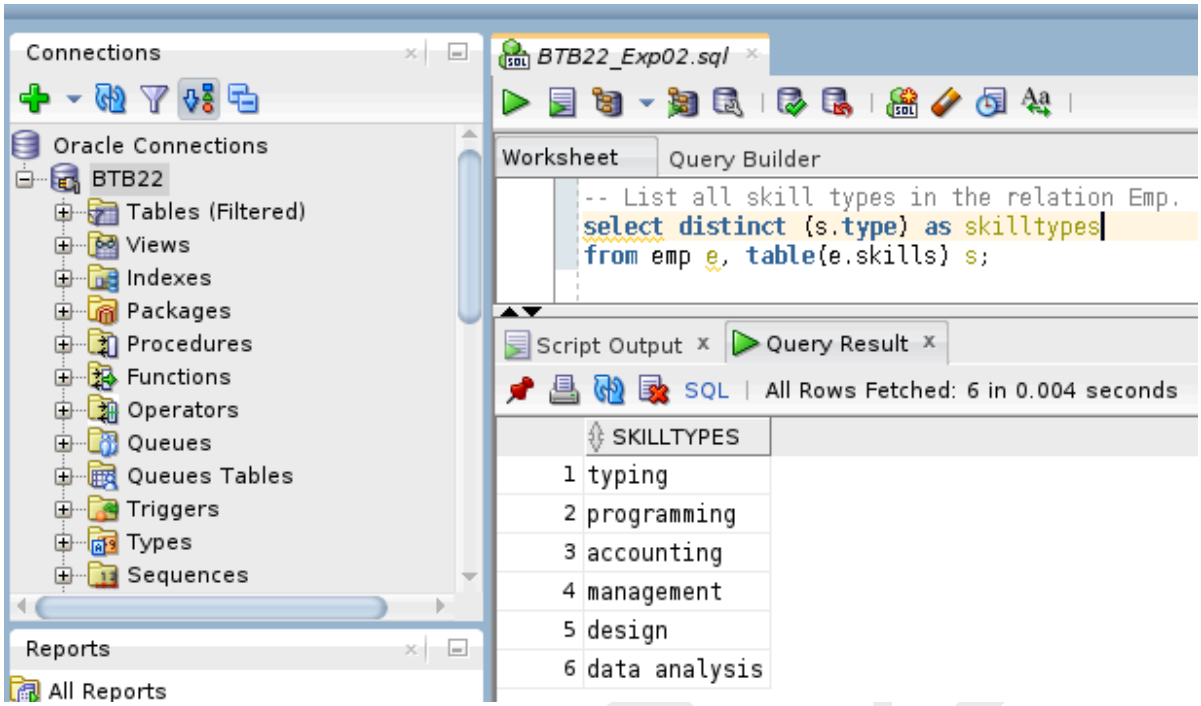
```
-- Find the names of all employees who have a child born on or after
January 1, 2000.
```




```
-- Find those employees who took an examination for the skill type typing
in the city Dayton
```




```
-- List all skill types in the relation Emp.
```



2. Implementing Table Inheritance in SQL Server

The following entities in a "School" database:

Super type: People

Sub types:

- Students
- Teachers
- Parents

Each of those entities has many of the same attributes, such as first name, last name, middle name, and birth date. Yet, we must separate them into multiple tables because we need to store and track different data for students, teachers and parents: students have grades and classes and parents; teachers have classes taught, skills, employment information, and so on.

Solution:

```
CREATE OR REPLACE TYPE people AS OBJECT (
        fname      VARCHAR2(50),
        lname      VARCHAR2(50),
        mname      VARCHAR2(50),
        birth_date DATE
```

```
) NOT FINAL;

CREATE OR REPLACE TYPE student UNDER people (
        grade       NUMBER,
        class       VARCHAR2(50),
        parent_name VARCHAR2(100)
);

CREATE OR REPLACE TYPE teacher UNDER people (
        classes_taught  VARCHAR2(100),
        skills          VARCHAR2(100),
        employment_info VARCHAR2(100)
);

CREATE OR REPLACE TYPE parent UNDER people (
    children VARCHAR2(100)
);

CREATE TABLE students OF student (
    PRIMARY KEY ( fname,
                  lname )
);

CREATE TABLE teachers OF teacher (
    PRIMARY KEY ( fname,
                  lname )
);

CREATE TABLE parents OF parent (
    PRIMARY KEY ( fname,
                  lname )
);

INSERT INTO students VALUES (
    'Pushkaraj',
    'Yadav',
    'D',
    DATE '2003-07-10',
    9,
    'Class
A',
    'Dilip Yadav'
);
```

```
INSERT INTO students VALUES (
    'Aryan',
    'Mangrule',
    'S',
    DATE '2003-05-22',
    8,
    'Class
B',
    'Sachin Mangrule'
);

INSERT INTO students VALUES (
    'Aditya',
    'PaΘl',
    'S',
    DATE '2003-11-15',
    10,
    'Class C',
    'Suresh PaΘl'
);

INSERT INTO students VALUES (
    'Ankita',
    'Desai',
    'B',
    DATE '2003-01-05',
    7,
    'Class D',
    'Babaso Desai'
);

INSERT INTO students VALUES (
    'Ishaan',
    'Deshmukh',
    'R',
    DATE '2003-08-12',
    11,
    'Class E',
    'Ramesh Deshmukh'
);

INSERT INTO students VALUES (
```

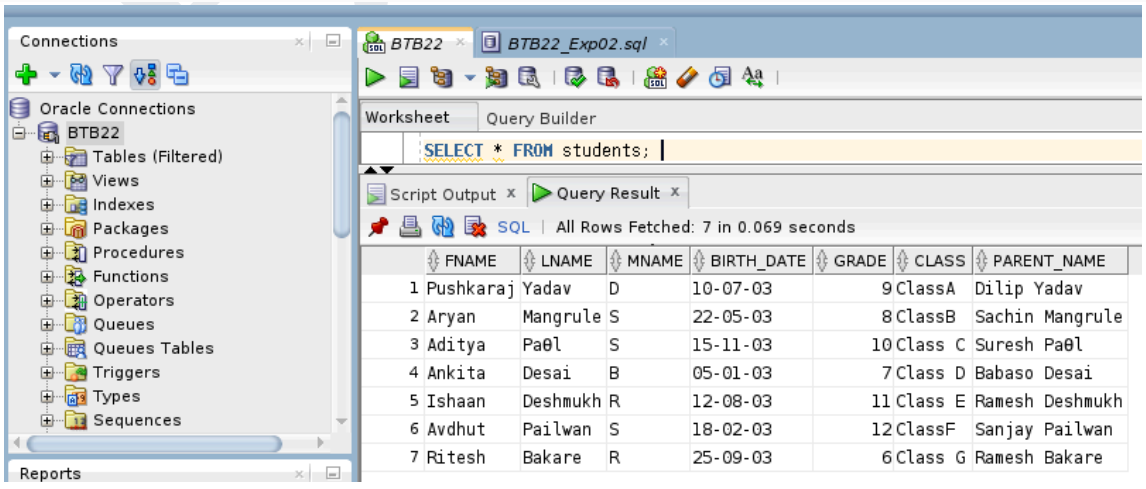
```
    'Avdhut',
    'Pailwan',
    'S',
    DATE '2003-02-18',
    12,
    'Class
F',
    'Sanjay Pailwan'
);

INSERT INTO students VALUES (
    'Ritesh',
    'Bakare',
    'R',
    DATE '2003-09-25',
    6,
    'Class G',
    'Ramesh Bakare'
);

INSERT INTO parents VALUES (
    'Dilip',
    'Yadav',
    'K',
    DATE '1975-04-10',
    'Pushkaraj
Yadav'
);

INSERT INTO parents VALUES (
    'Sachin',
    'Mangrule',
    'M',
    DATE '1972-07-23',
    'Aryan
Mangrule'
);

INSERT INTO parents VALUES (
    'Suresh',
    'PaΘl',
    'S',
    DATE '1979-05-15',
```

```
    'Aditya PaΘl'
);

INSERT INTO parents VALUES (
    'Babaso',
    'Desai',
    'L',
    DATE '1980-09-17',
    'Ankita
Desai'
);

INSERT INTO parents VALUES (
    'Ramesh',
    'Deshmukh',
    'N',
    DATE '1982-11-02',
    'Ishaan
Deshmukh'
);

INSERT INTO parents VALUES (
    'Sanjay',
    'Pailwan',
    'R',
    DATE '1976-03-22',
    'Avdhut
Pailwan'
);

INSERT INTO parents VALUES (
    'Ramesh',
    'Bakare',
    'P',
    DATE '1978-10-10',
    'Ritesh
Bakare'
);

INSERT INTO teachers VALUES (
    'Pooja',
    'Reddy',
    'T',
```

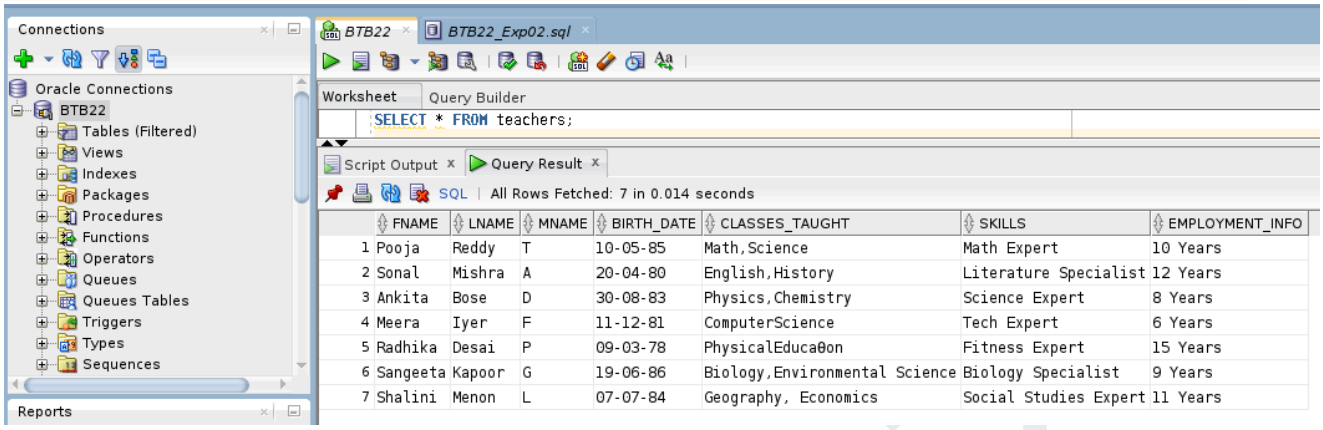
```
    DATE '1985-05-10',
    'Math,
Science',
    'Math Expert',
    '10 Years'
);

INSERT INTO teachers VALUES (
    'Sonal',
    'Mishra',
    'A',
    DATE '1980-04-20',
    'English,
History',
    'Literature Specialist',
    '12 Years'
);

INSERT INTO teachers VALUES (
    'Ankita',
    'Bose',
    'D',
    DATE '1983-08-30',
    'Physics,
Chemistry',
    'Science Expert',
    '8 Years'
);

INSERT INTO teachers VALUES (
    'Meera',
    'Iyer',
    'F',
    DATE '1981-12-11',
    'Computer
Science',
    'Tech Expert',
    '6 Years'
);

INSERT INTO teachers VALUES (
    'Radhika',
    'Desai',
```

```
    'P',
    DATE '1978-03-09',
    'Physical
EducaϴOn',
    'Fitness Expert',
    '15 Years'
);

INSERT INTO teachers VALUES (
    'Sangeeta',
    'Kapoor',
    'G',
    DATE '1986-06-19',
    'Biology,
Environmental Science',
    'Biology Specialist',
    '9 Years'
);

INSERT INTO teachers VALUES (
    'Shalini',
    'Menon',
    'L',
    DATE '1984-07-07',
    'Geography, Economics',
    'Social Studies Expert',
    '11 Years'
);
```

```
SELECT * FROM students;
```

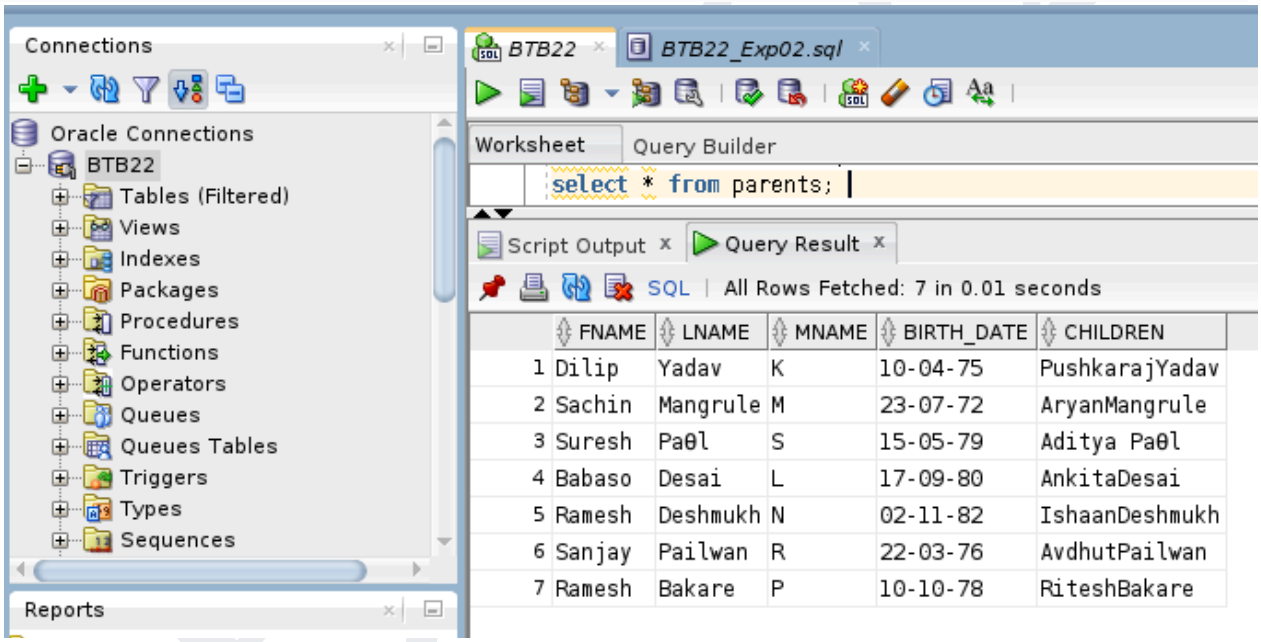


```
SELECT * FROM teachers;
```



	FNAME	LNAME	MNAME	BIRTH_DATE	CLASSES_TAUGHT	SKILLS	EMPLOYMENT_INFO
1	Pooja	Reddy	T	10-05-85	Math,Science	Math Expert	10 Years
2	Sonal	Mishra	A	20-04-80	English,History	Literature Specialist	12 Years
3	Ankita	Bose	D	30-08-83	Physics,Chemistry	Science Expert	8 Years
4	Meera	Iyer	F	11-12-81	ComputerScience	Tech Expert	6 Years
5	Radhika	Desai	P	09-03-78	PhysicalEducaθon	Fitness Expert	15 Years
6	Sangeeta	Kapoor	G	19-06-86	Biology,Environmental Science	Biology Specialist	9 Years
7	Shalini	Menon	L	07-07-84	Geography, Economics	Social Studies Expert	11 Years

```
SELECT * FROM parents;
```



	FNAME	LNAME	MNAME	BIRTH_DATE	CHILDREN
1	Dilip	Yadav	K	10-04-75	PushkarajYadav
2	Sachin	Mangrule	M	23-07-72	AryanMangrule
3	Suresh	Paθl	S	15-05-79	Aditya Paθl
4	Babaso	Desai	L	17-09-80	AnkitaDesai
5	Ramesh	Deshmukh	N	02-11-82	IshaanDeshmukh
6	Sanjay	Pailwan	R	22-03-76	AvdhutPailwan
7	Ramesh	Bakare	P	10-10-78	RiteshBakare