

Experiment No. : 2

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.

Connections: Oracle Connections, BTB22, Tables (Filtered), Views, Indexes, Packages, Procedures, Functions, Operators, Queues, Queues Tables, Triggers, Types, Sequences.

Reports: All Reports, Analytic View Reports, Data Dictionary Reports, Data Modeler Reports, OLAP Reports, TimesTen Reports, User Defined Reports.

Worksheet: BTB22_Exp02.sql

```
-- Find the names of all employees who have a child born on or after January 1, 2000 .
select ename
from emp e
where exists (
  select 1
  from table (e.children) c
  where c.birthday > to_date('2000-01-01', 'YYYY-MM-DD')
);
```

Script Output: Query Result

SQL | All Rows Fetched: 9 in 0.007 seconds

ENAME
1 Alice Smith
2 Charlie Brown
3 David Wilson
4 Emma Davis
5 Frank Miller
6 Grace Lee
7 Henry Clark
8 Ivy Taylor
9 Jack Harris

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

Connections: Oracle Connections, BTB22, Tables (Filtered), Views, Indexes, Packages, Procedures, Functions, Operators, Queues, Queues Tables, Triggers, Types, Sequences.

Reports: All Reports, Analytic View Reports, Data Dictionary Reports, Data Modeler Reports, OLAP Reports, TimesTen Reports, User Defined Reports.

Worksheet: BTB22_Exp02.sql

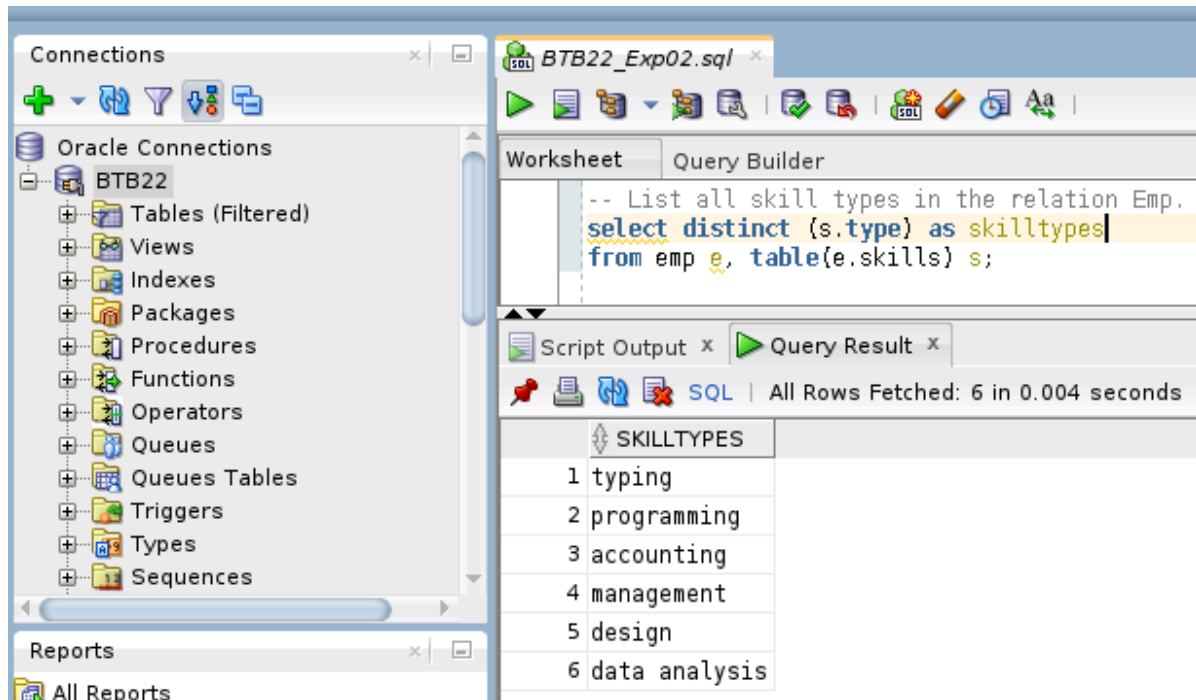
```
-- Find those employees who took an examination for the skill type typing in the city Dayton
select ename
from emp e
where exists(
  select 1
  from table(e.skills) s, table(s.exams) ex
  where s.type = 'typing'
  and ex.city = 'Dayton'
);
```

Script Output: Query Result

SQL | All Rows Fetched: 9 in 0.017 seconds

ENAME
1 Alice Smith
2 Bob Johnson
3 David Wilson
4 Emma Davis
5 Frank Miller
6 Grace Lee
7 Henry Clark
8 Ivy Taylor
9 Jack Harris

-- 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',  
    'Pa01',  
    'S',  
    DATE '2003-11-15',  
    10,  
    'Class C',  
    'Suresh Pa01'  
);
```

```
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',
    'Pa01',
    'S',
    DATE '1979-05-15',

```

```

        'Aditya Pa01'
    );

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',

```

```

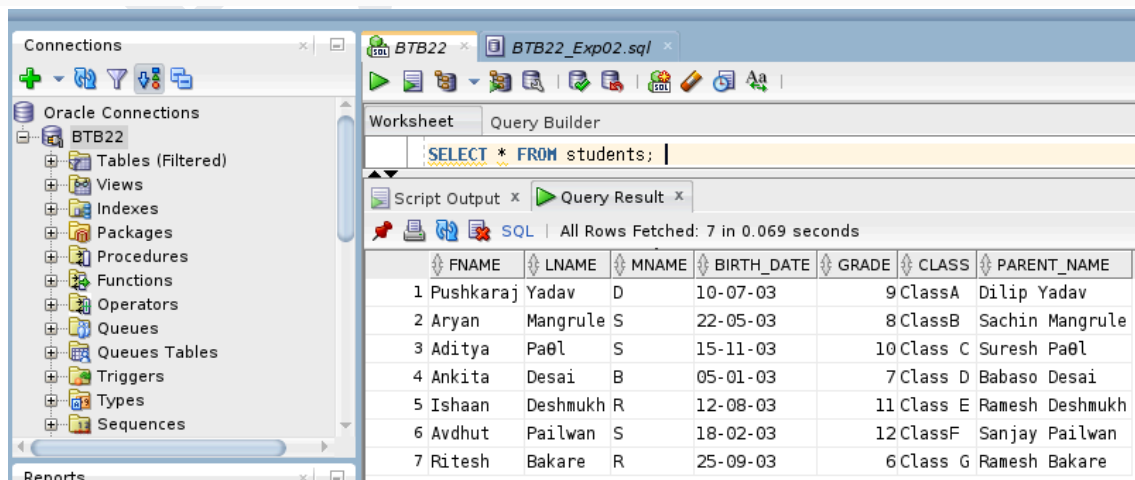
        'P',
        DATE '1978-03-09',
        'Physical
Educa0on',
        'Fitness Expert',
        '15 Years'
    );

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'
);

```

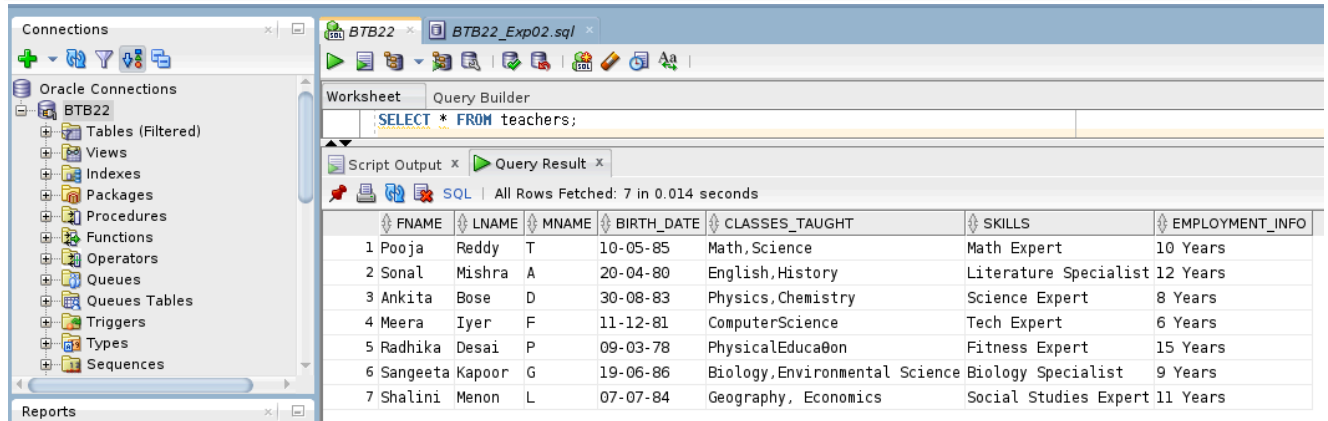
```
SELECT * FROM students;
```



The screenshot shows the SQL Developer interface. The left pane displays the 'Connections' tree with 'BTB22' selected. The main workspace shows the 'Query Builder' tab with the query 'SELECT * FROM students;'. Below the query, the 'Query Result' tab displays the results of the query, showing 7 rows of student data. The status bar indicates 'All Rows Fetched: 7 in 0.069 seconds'.

	FNAME	LNAME	MNAME	BIRTH_DATE	GRADE	CLASS	PARENT_NAME
1	Pushkaraj	Yadav	D	10-07-03	9	ClassA	Dilip Yadav
2	Aryan	Mangrula	S	22-05-03	8	ClassB	Sachin Mangrula
3	Aditya	Pa0l	S	15-11-03	10	Class C	Suresh Pa0l
4	Ankita	Desai	B	05-01-03	7	Class D	Babaso Desai
5	Ishaan	Deshmukh	R	12-08-03	11	Class E	Ramesh Deshmukh
6	Avdhut	Pailwan	S	18-02-03	12	ClassF	Sanjay Pailwan
7	Ritesh	Bakare	R	25-09-03	6	Class G	Ramesh Bakare

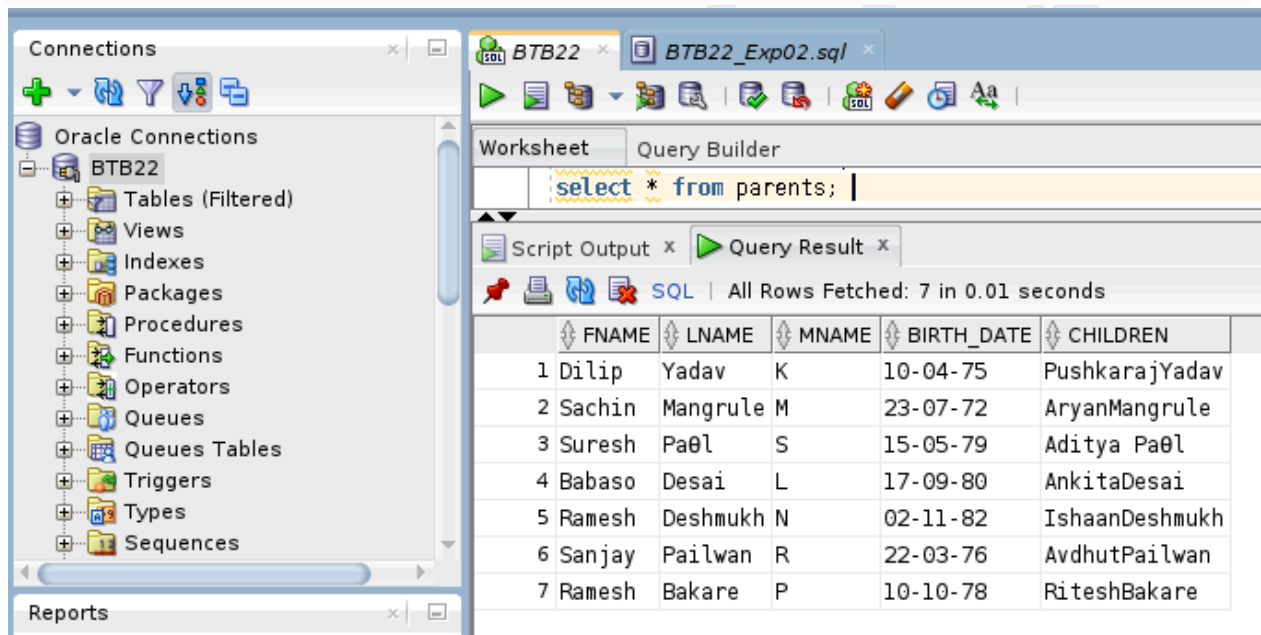
SELECT * FROM teachers;



The screenshot shows the SQL Developer interface with the query 'SELECT * FROM teachers;' executed. The results are displayed in a table with 7 rows and 7 columns: FNAME, LNAME, MNAME, BIRTH_DATE, CLASSES_TAUGHT, SKILLS, and EMPLOYMENT_INFO.

	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	Computer Science	Tech Expert	6 Years
5	Radhika	Desai	P	09-03-78	Physical Education	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;



The screenshot shows the SQL Developer interface with the query 'select * from parents;' executed. The results are displayed in a table with 7 rows and 5 columns: FNAME, LNAME, MNAME, BIRTH_DATE, and CHILDREN.

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