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Harmony IT Solution

Web Application Programming Interface (API)

Tahaluf Training Center 2022

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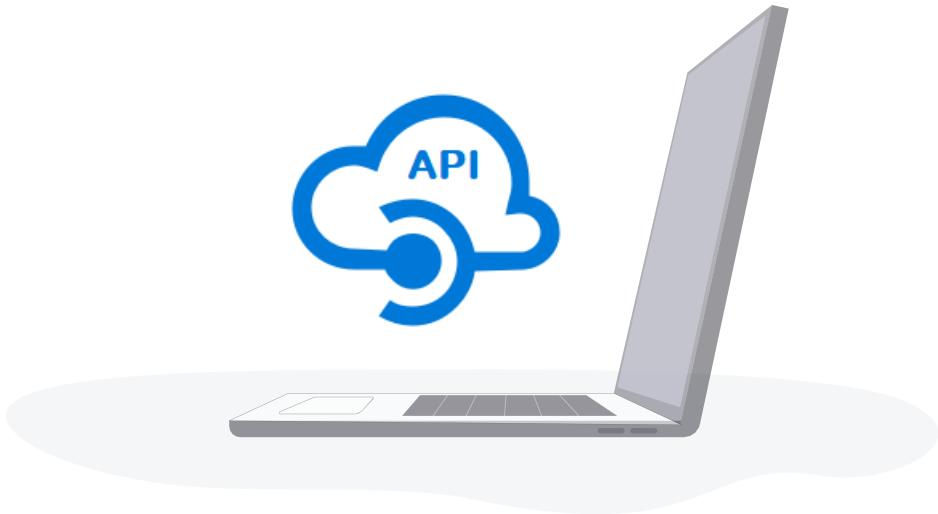

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Create a Class Diagram

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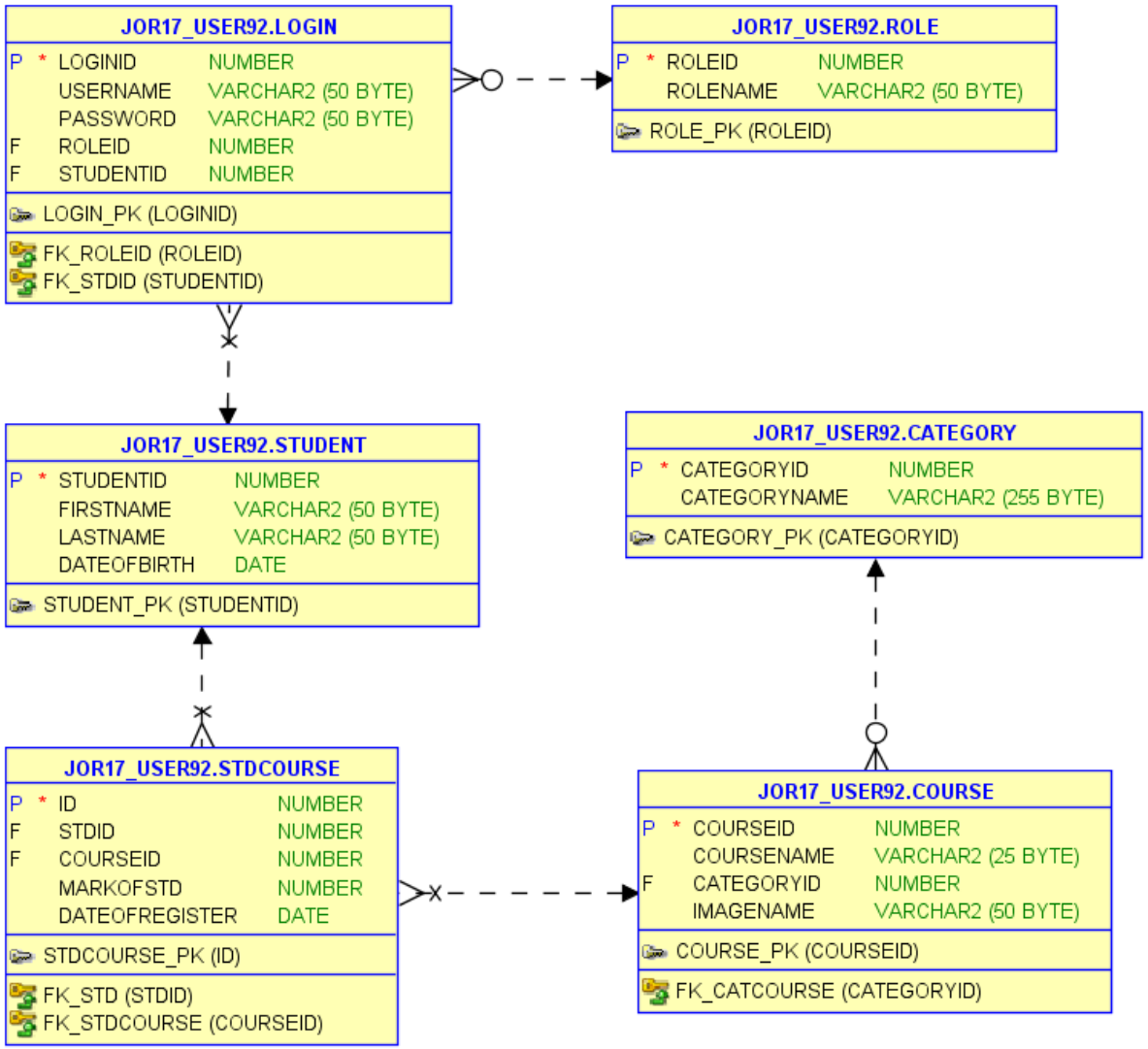

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Overview of Package

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A package is a schema object used to collect logically related PL/SQL variables, types and subprograms.

Packages have two parts, a specification (header) and a body.

The specification is the interface.

The body used to define the code for the subprograms and the queries for the cursors.

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Overview of Stored Procedure

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Stored procedures are similar to functions.

Stored procedure is created once and can be executed more than one time.

A stored procedure is created with a CREATE PROCEDURE statement and is executed with a CALL statement.

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Create Package And Stored Procedure

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Example 1

Create a course package that contains stored procedures to:

- display all courses in the database.
- Create a course.
- Update a course.
- Delete a course
- Get course by ID

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Packages Specification

```
create or replace PACKAGE Course_Package
As
PROCEDURE GetAllCourses;
PROCEDURE GetCourseById(id in number) ;
PROCEDURE CREATECOURSE(COURSENAME IN course.coursename%TYPE, CATID
IN course.categoryid%TYPE, image in varchar);
PROCEDURE UPDATECOURSE( ID IN NUMBER ,CNAME IN
course.coursename%TYPE, CATID IN course.categoryid%TYPE, image in varchar);
PROCEDURE DeleteCourse(Id in number);
End Course_Package;
```

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Packages Body

```
create or replace Package BODY Course_Package
As
PROCEDURE GetAllCourses
As
cur_all SYS_REFCURSOR ;
Begin
open cur_all for
Select * From course ;
Dbms_sql.return_result(cur_all);
End GetAllCourses ;
```

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Packages Body

```
PROCEDURE GetCourseById(id in number)
As
Cur_item SYS_REFCURSOR;
Begin
open cur_item for
select * from course
where courseid = id;
Dbms_sql.return_result(cur_item);
End GetCourseById;
```

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Packages Body

```
PROCEDURE CREATECOURSE(COURSENAME IN course.coursename%TYPE, CATID
IN course.categoryid%TYPE , image in varchar)
AS
id number ;
BEGIN
INSERT INTO COURSE VALUES (DEFAULT , COURSENAME , CATID , image );
COMMIT;

END CREATECOURSE;
```

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Packages Body

```
PROCEDURE UPDATECOURSE( ID IN NUMBER ,CNAME IN
course.coursename%TYPE, CATID IN course.categoryid%TYPE , image in varchar)
AS
BEGIN
UPDATE COURSE
SET COURSENAME = CNAME , categoryid = CATID , imagename = image
WHERE COURSEID = ID ;
COMMIT;
END UPDATECOURSE;
```

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Packages Body

```
PROCEDURE DeleteCourse(Id in number)
As
Begin
delete from course
where courseid = id ;
commit;
End DeleteCourse;

End Course_Package;
```

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Example 2

Create a student package that contains stored procedures to:

- display all students in the database.
- Create a student.
- Update a student.
- Delete a student
- Get student by ID

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Packages Specification

```
create or replace PACKAGE Student_Package AS
PROCEDURE GetAllStudent;
PROCEDURE CreateStudent(first_name IN VARCHAR,last_name in varchar,date_of_birth in date);
PROCEDURE UpdateStudent(ID IN NUMBER, first_name IN VARCHAR,last_name IN
VARCHAR,date_of_birth date);
PROCEDURE DeleteStudent(ID IN NUMBER);
PROCEDURE GetStudentById(ID IN NUMBER);
END Student_Package;
```

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Packages Body

```
create or replace PACKAGE Body Student_Package as
PROCEDURE GetAllStudent
AS
c_all sys_refcursor;
BEGIN
open c_all for
select * from Student;
DBMS_SQL.RETURN_RESULT(c_all);
END GetAllStudent;
```

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Packages Body

```
PROCEDURE CreateStudent(first_name IN VARCHAR,last_name in
varchar,date_of_birth in date)
IS
BEGIN
INSERT INTO Student (firstName ,lastname ,dateofbirth )
VALUES(first_name,last_name,date_of_birth);
COMMIT;
END CreateStudent;
```

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Packages Body

```
PROCEDURE UpdateStudent(ID IN NUMBER, first_name IN VARCHAR,last_name
IN VARCHAR,date_of_birth date)
IS
BEGIN
Update Student SET firstname=first_name,lastname
=last_name,dateofbirth=date_of_birth
WHERE studentid =ID;
COMMIT;
END UpdateStudent;
```

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Packages Body

```
PROCEDURE DeleteStudent(ID IN NUMBER)
IS
BEGIN
DELETE Student WHERE studentid =ID;
COMMIT;
END DeleteStudent;
```

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Packages Body

```
PROCEDURE GetStudentById(ID IN NUMBER)
AS
c_all sys_refcursor;
BEGIN
OPEN c_all FOR
SELECT * FROM Student WHERE studentid =ID;
DBMS_SQL.RETURN_RESULT(c_all);
END GetStudentById;
END Student_Package;
```

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Example 3

Create a studentCourse package that contains stored procedures to:

- display all studentCourse in the database.
- Create a studentCourse.
- Update a studentCourse.
- Delete a studentCourse
- Get studentCourse by ID

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Packages Specification

```
create or replace PACKAGE stdcourse_Package AS
PROCEDURE GetAllStdCourse;
PROCEDURE CreateStdCourse(stdidid IN number,courseid in number,markof in number,
dateof_register in date);
PROCEDURE UpdateStdCourse(SCid in number, stdidid IN number,courseid in number,markof in
number,dateof_register in date);
PROCEDURE DeleteStdCourse(ID IN NUMBER);
PROCEDURE GetStdCourseById(ID IN NUMBER);
END stdcourse_Package;
```

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Packages Body

```
create or replace PACKAGE Body stdcourse_Package as
PROCEDURE GetAllStdCourse
AS
c_all sys_refcursor;
BEGIN
open c_all for
select * from stdcourse;
DBMS_SQL.RETURN_RESULT(c_all);
END GetAllStdCourse;
```

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Packages Body

```
PROCEDURE CreateStdCourse(stdidid IN number,courseid in number,markof in
number,dateof_register in date)
IS
BEGIN
INSERT INTO stdcourse (stdid ,courseid ,markofstd,dateofregister )
VALUES(stdidid,courseid,markof,dateof_register);
COMMIT;
END CreateStdCourse;
```

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Packages Body

```
PROCEDURE UpdateStdCourse(SCid in number,stdidid IN number,courseid in
number,markof in number,dateof_register in date)
IS
BEGIN
Update stdcourse SET stdid = stdidid, courseid
=courseid,markofstd=markof,dateofregister=dateof_register
WHERE id =SCid;
COMMIT;
END UpdateStdCourse;
```

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Packages Body

```
PROCEDURE DeleteStdCourse(ID IN NUMBER)
IS
BEGIN
DELETE stdcourse WHERE id =ID;
COMMIT;
END DeleteStdCourse;
```

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Packages Body

```
PROCEDURE GetStdCourseById(ID IN NUMBER)
AS
c_all sys_refcursor;
BEGIN
OPEN c_all FOR
SELECT * FROM stdcourse WHERE courseid =ID;
DBMS_SQL.RETURN_RESULT(c_all);
END GetStdCourseById;
END stdcourse_Package;
```

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Exercise

- ✓ Create a stored procedure to display FirstName and LastName from table student.
- ✓ Create a stored procedure to display student by firstName.
- ✓ Create a stored procedure to display student by BirthOfDate.
- ✓ Create a stored procedure to display a student by BirthOfDate interval.
- ✓ Create a stored procedure to display the students name with the highest n(3,4,…) marks

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In Student_Packages Specification Add:

```
PROCEDURE GetStudentByFirstName(First_Name IN VARCHAR);
PROCEDURE GetStudentFNameAndLName;
PROCEDURE GetStudentByBirthdate(Birth_Date IN date);
PROCEDURE GetStudentBetweenInterval(DateFrom in date , DateTo in date);
procedure GetStudentsWithHighestMarks(NumOfStudent in number);
```

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In Student_Packages Body Add:

```
PROCEDURE GetStudentByFirstName(First_Name IN VARCHAR)
AS
c_all sys_refcursor;
BEGIN
OPEN c_all for
SELECT * FROM Student WHERE FirstName=First_name;
DBMS_SQL.RETURN_RESULT(c_all);
END GetStudentByFirstName;
```

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In Student_Packages Body Add:

```
PROCEDURE GetStudentFNameAndLName
AS
c_all sys_refcursor;
BEGIN
OPEN c_all FOR
SELECT FirstName,LastName FROM Student;
DBMS_SQL.RETURN_RESULT(c_all);
END GetStudentFNameAndLName;
```

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In Student_Packages Body Add:

```
PROCEDURE GetStudentByBirthdate(Birth_Date IN date)
AS
c_all sys_refcursor;
BEGIN
OPEN c_all for
SELECT * FROM Student WHERE Trunc(DATEOFBIRTH) = Birth_Date;
DBMS_SQL.RETURN_RESULT(c_all);
END GetStudentByBirthdate;
```

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In Student_Packages Body Add:

```
PROCEDURE GetStudentBetweenInterval(DateFrom in date , DateTo in date)
As
c_all SYS_REFCURSOR ;
Begin
open c_all for
select * from student
where dateofbirth >= datefrom and dateofbirth <= dateto;
dbms_sql.return_result(c_all);
End GetStudentBetweenInterval ;
```

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In Student_Packages Body Add:

```
procedure GetStudentsWithHighestMarks(NumOfStudent in number)
As
c_all SYS_REFCURSOR;
Begin
open c_all for
select * from
(select s.*
from student s
inner join stdcourse sc
on s.studentid = sc.stdid
order by sc.markofstd desc)
where Rownum <= NumOfStudent;
Dbms_sql.return_result(c_all);
End GetStudentsWithHighestMarks;
```