

Creating a package

```
CREATE OR REPLACE PACKAGE TEST_PACKAGE AS
    FUNCTION TEST_FUNCTION RETURN VARCHAR2;
    PROCEDURE TEST_PROCEDURE;
END TEST_PACKAGE;
/
CREATE OR REPLACE PACKAGE BODY TEST_PACKAGE AS
    FUNCTION TEST_FUNCTION RETURN VARCHAR2 AS
        V_TEST VARCHAR2(10);
        V_TEST2 VARCHAR2(10) NOT NULL :=
'test2';
    BEGIN
        V_TEST := 'test';
        RETURN V_TEST;
    END TEST_FUNCTION;
    PROCEDURE TEST_PROCEDURE IS
    BEGIN
        NULL;
    END TEST_PROCEDURE;
END TEST_PACKAGE;
/
```

A package consists of a **specification** and a **body**.



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Not published yet.

Last updated 5th August, 2023.

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Creating an object type

```
-- an abstract object
CREATE OR REPLACE TYPE RECTANGLE FORCE AS
    OBJECT (
        LENGTH NUMBER,
        WIDTH NUMBER,
        NOT INSTANTIABLE NOT FINAL MEMBER
        PROCEDURE DISPLAY,
        -- define a map or order function
        for comparison
        NOT INSTANTIABLE NOT FINAL MAP
        MEMBER FUNCTION AREA
                                RETURN NUMBER
    ) NOT INSTANTIABLE NOT FINAL;
/

CREATE OR REPLACE TYPE SQUARE UNDER RECTANGLE (
    CONSTRUCTOR FUNCTION SQUARE (LENGTH
    NUMBER, WIDTH NUMBER)
        RETURN SELF AS RESULT,
    OVERRIDING FINAL MEMBER PROCEDURE DISPLAY,
    OVERRIDING FINAL MAP MEMBER FUNCTION AREA
    RETURN NUMBER,
    STATIC FUNCTION TEST RETURN VARCHAR2
) FINAL;
/

CREATE OR REPLACE TYPE BODY SQUARE AS
    CONSTRUCTOR FUNCTION SQUARE (LENGTH
    NUMBER, WIDTH NUMBER)
        RETURN SELF AS RESULT AS
    BEGIN
        SELF.LENGTH := LENGTH;
        SELF.WIDTH := WIDTH;
        RETURN;
    END;
    OVERRIDING FINAL MEMBER PROCEDURE DISPLAY
AS
    BEGIN
        DBMS_OUTPUT.PUT_LINE('Square: '
        || SELF.LENGTH);
    END;
    OVERRIDING FINAL MAP MEMBER FUNCTION AREA
```

Creating an object type (cont)

```
> RETURN NUMBER AS
BEGIN
    RETURN LENGTH * LENGTH;
END;
STATIC FUNCTION TEST RETURN VARCHAR2 AS
BEGIN
    -- SELF and instance attributes are not available
    -- in static functions
    RETURN 'test';
END;
END;
/
```

SELF refers to the current instance of an object. It is an **implicit** parameter for methods - **IN** for functions and **IN OUT** for procedures. It may be omitted when used with **MEMBER** methods. Objects support only Oracle types - **no user defined types** are supported in attributes and methods.



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Last updated 5th August, 2023.

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