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-----Expllit
Cursor-----
-----

```

```

declare
  cursor c_emps is select first_name,last_name from employees;
  v_first_name employees.first_name%type;
  v_last_name employees.last_name%type;
begin
  open c_emps;
  fetch c_emps into v_first_name,v_last_name;
  fetch c_emps into v_first_name,v_last_name;
  fetch c_emps into v_first_name,v_last_name;
  dbms_output.put_line(v_first_name|| ' ' || v_last_name);
  fetch c_emps into v_first_name,v_last_name;
  dbms_output.put_line(v_first_name|| ' ' || v_last_name);
  close c_emps;
end;

```

```

----- cursor with join
example-----

```

```

declare
  cursor c_emps is select first_name,last_name, department_name from employees
                    join departments using (department_id)
                    where department_id between 30 and 60;
  v_first_name employees.first_name%type;
  v_last_name employees.last_name%type;
  v_department_name departments.department_name%type;
begin
  open c_emps;
  fetch c_emps into v_first_name, v_last_name,v_department_name;
  dbms_output.put_line(v_first_name|| ' ' || v_last_name|| ' in the department of
' || v_department_name);
  close c_emps;
end;

```

```

-----
-----
-----cursor with
Records-----
-----

```

```

declare
  type r_emp is record ( v_first_name employees.first_name%type,
                        v_last_name employees.last_name%type);
  v_emp r_emp;
  cursor c_emps is select first_name,last_name from employees;
begin
  open c_emps;
  fetch c_emps into v_emp;
  dbms_output.put_line(v_emp.v_first_name|| ' ' || v_emp.v_last_name);
  close c_emps;
end;

```

```

----- An example for using cursors table rowtype-----

```

```

declare

```

```

    v_emp employees%rowtype;
    cursor c_emps is select first_name,last_name from employees;
begin
    open c_emps;
    fetch c_emps into v_emp.first_name,v_emp.last_name;
    dbms_output.put_line(v_emp.first_name|| ' ' || v_emp.last_name);
    close c_emps;
end;

```

----- An example for using cursors with cursor%rowtype.-----

```

declare
    cursor c_emps is select first_name,last_name from employees;
    v_emp c_emps%rowtype;
begin
    open c_emps;
    fetch c_emps into v_emp.first_name,v_emp.last_name;
    dbms_output.put_line(v_emp.first_name|| ' ' || v_emp.last_name);
    close c_emps;
end;

```

-----looping with
cursor-----

```

declare
    cursor c_emps is select * from employees where department_id = 30;
    v_emps c_emps%rowtype;
begin
    open c_emps;
    loop
        fetch c_emps into v_emps;
        dbms_output.put_line(v_emps.employee_id|| ' ' ||v_emps.first_name|| ' ' ||
v_emps.last_name);
    end loop;
    close c_emps;
end;

```

-----%notfound example-----

```

declare
    cursor c_emps is select * from employees where department_id = 30;
    v_emps c_emps%rowtype;
begin
    open c_emps;
    loop
        fetch c_emps into v_emps;
        exit when c_emps%notfound;
        dbms_output.put_line(v_emps.employee_id|| ' ' ||v_emps.first_name|| ' ' ||
v_emps.last_name);
    end loop;
    close c_emps;
end;

```

-----while loop example-----

```

declare
    cursor c_emps is select * from employees where department_id = 30;
    v_emps c_emps%rowtype;

```

```

begin
  open c_emps;
  fetch c_emps into v_emps;
  while c_emps%found loop
    dbms_output.put_line(v_emps.employee_id|| ' ' ||v_emps.first_name|| ' ' ||
v_emps.last_name);
    fetch c_emps into v_emps;
    --exit when c_emps%notfound;
  end loop;
  close c_emps;
end;

```

-----for loop with cursor example-----

```

declare
  cursor c_emps is select * from employees where department_id = 30;
  v_emps c_emps%rowtype;
begin
  open c_emps;
  for i in 1..6 loop
    fetch c_emps into v_emps;
    dbms_output.put_line(v_emps.employee_id|| ' ' ||v_emps.first_name|| ' ' ||
v_emps.last_name);
  end loop;
  close c_emps;
end;

```

-----FOR..IN clause example-----

```

declare
  cursor c_emps is select * from employees where department_id = 30;
begin
  for i in c_emps loop
    dbms_output.put_line(i.employee_id|| ' ' ||i.first_name|| ' ' ||i.last_name);
  end loop;
end;

```

-----FOR..IN with select example-----

```

begin
  for i in (select * from employees where department_id = 30) loop
    dbms_output.put_line(i.employee_id|| ' ' ||i.first_name|| ' ' ||i.last_name);
  end loop;
end;

```

-----cursor with

parameter-----

```

declare
  cursor c_emps (p_dept_id number) is select first_name,last_name,department_name
    from employees join departments using (department_id)
    where department_id = p_dept_id;
  v_emps c_emps%rowtype;
begin
  open c_emps(20);
  fetch c_emps into v_emps;
  dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');

```

```

        close c_emps;
    open c_emps(20);
    loop
        fetch c_emps into v_emps;
        exit when c_emps%notfound;
        dbms_output.put_line(v_emps.first_name|| ' ' ||v_emps.last_name);
    end loop;
    close c_emps;
end;

```

----- bind variables as parameters-----

```

declare
    cursor c_emps (p_dept_id number) is select first_name,last_name,department_name
        from employees join departments using (department_id)
        where department_id = p_dept_id;
    v_emps c_emps%rowtype;
begin
    open c_emps(:b_emp);
    fetch c_emps into v_emps;
    dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');
    close c_emps;
    open c_emps(:b_emp);
    loop
        fetch c_emps into v_emps;
        exit when c_emps%notfound;
        dbms_output.put_line(v_emps.first_name|| ' ' ||v_emps.last_name);
    end loop;
    close c_emps;
end;

```

-----cursors with two different parameters-----

```

declare
    cursor c_emps (p_dept_id number) is select first_name,last_name,department_name
        from employees join departments using (department_id)
        where department_id = p_dept_id;
    v_emps c_emps%rowtype;
begin
    open c_emps(:b_dept_id);
    fetch c_emps into v_emps;
    dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');
    close c_emps;
    open c_emps(:b_dept_id);
    loop
        fetch c_emps into v_emps;
        exit when c_emps%notfound;
        dbms_output.put_line(v_emps.first_name|| ' ' ||v_emps.last_name);
    end loop;
    close c_emps;

    open c_emps(:b_dept_id2);
    fetch c_emps into v_emps;
    dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');
    close c_emps;
    open c_emps(:b_dept_id2);

```

```

        loop
            fetch c_emps into v_emps;
            exit when c_emps%notfound;
            dbms_output.put_line(v_emps.first_name|| ' ' ||v_emps.last_name);
        end loop;
    close c_emps;
end;

```

----- cursor with parameters - for in loops-----

```

declare
    cursor c_emps (p_dept_id number) is select first_name,last_name,department_name
        from employees join departments using (department_id)
        where department_id = p_dept_id;
    v_emps c_emps%rowtype;
begin
    open c_emps(:b_dept_id);
    fetch c_emps into v_emps;
    dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');
    close c_emps;
    open c_emps(:b_dept_id);
    loop
        fetch c_emps into v_emps;
        exit when c_emps%notfound;
        dbms_output.put_line(v_emps.first_name|| ' ' ||v_emps.last_name);
    end loop;
    close c_emps;

    open c_emps(:b_dept_id2);
    fetch c_emps into v_emps;
    dbms_output.put_line('The employees in department of '||
v_emps.department_name|| ' are :');
    close c_emps;

    for i in c_emps(:b_dept_id2) loop
        dbms_output.put_line(i.first_name|| ' ' ||i.last_name);
    end loop;
end;

```

-----cursors with multiple parameters-----

```

declare
    cursor c_emps (p_dept_id number , p_job_id varchar2) is select
first_name,last_name,job_id,department_name
        from employees join departments using (department_id)
        where department_id = p_dept_id
        and job_id = p_job_id;
    v_emps c_emps%rowtype;
begin
    for i in c_emps(50,'ST_MAN') loop
        dbms_output.put_line(i.first_name|| ' ' ||i.last_name|| ' - ' || i.job_id);
    end loop;
    dbms_output.put_line(' - ');
    for i in c_emps(80,'SA_MAN') loop
        dbms_output.put_line(i.first_name|| ' ' ||i.last_name|| ' - ' || i.job_id);
    end loop;
end;

```

----- An error example of using parameter name with the column
name-----

```
declare
  cursor c_emps (p_dept_id number , job_id varchar2) is select
first_name,last_name,job_id,department_name
                from employees join departments using (department_id)
                where department_id = p_dept_id
                and job_id = job_id;
  v_emps c_emps%rowtype;
begin
  for i in c_emps(50,'ST_MAN') loop
    dbms_output.put_line(i.first_name|| ' ' ||i.last_name|| ' - ' || i.job_id);
  end loop;
  dbms_output.put_line(' - ');
  for i in c_emps(80,'SA_MAN') loop
    dbms_output.put_line(i.first_name|| ' ' ||i.last_name|| ' - ' || i.job_id);
  end loop;
end;
```


-----cursor

Attributes-----

```
declare
  cursor c_emps is select * from employees where department_id = 50;
  v_emps c_emps%rowtype;
begin
  if not c_emps%isopen then
    open c_emps;
    dbms_output.put_line('hello');
  end if;
  dbms_output.put_line(c_emps%rowcount);
  fetch c_emps into v_emps;
  dbms_output.put_line(c_emps%rowcount);
  dbms_output.put_line(c_emps%rowcount);
  fetch c_emps into v_emps;
  dbms_output.put_line(c_emps%rowcount);
  close c_emps;

  open c_emps;
  loop
    fetch c_emps into v_emps;
    exit when c_emps%notfound or c_emps%rowcount>5;
    dbms_output.put_line(c_emps%rowcount|| ' ' ||v_emps.first_name|| ' ' ||
v_emps.last_name);
  end loop;
  close c_emps;
end;
```


-----for update

cluse-----

```
grant create session to my_user;
grant select any table to my_user;
grant update on hr.employees_copy to my_user;
grant update on hr.departments to my_user;
UPDATE EMPLOYEES_COPY SET PHONE_NUMBER = '1' WHERE EMPLOYEE_ID = 100;
```

```

declare
  cursor c_emps is select employee_id,first_name,last_name,department_name
    from employees_copy join departments using (department_id)
    where employee_id in (100,101,102)
    for update;
begin
  /* for r_emps in c_emps loop
    update employees_copy set phone_number = 3
      where employee_id = r_emps.employee_id;
  end loop; */
  open c_emps;
end;

```

----- example of wait with second-----

```

declare
  cursor c_emps is select employee_id,first_name,last_name,department_name
    from employees_copy join departments using (department_id)
    where employee_id in (100,101,102)
    for update of employees_copy.phone_number,
      departments.location_id wait 5;
begin
  /* for r_emps in c_emps loop
    update employees_copy set phone_number = 3
      where employee_id = r_emps.employee_id;
  end loop; */
  open c_emps;
end;

```

-----example of nowait-----

```

declare
  cursor c_emps is select employee_id,first_name,last_name,department_name
    from employees_copy join departments using (department_id)
    where employee_id in (100,101,102)
    for update of employees_copy.phone_number,
      departments.location_id nowait;
begin
  /* for r_emps in c_emps loop
    update employees_copy set phone_number = 3
      where employee_id = r_emps.employee_id;
  end loop; */
  open c_emps;
end;

```

-----where current of

clouse-----

declare

```

  cursor c_emps is select * from employees
    where department_id = 30 for update;

```

begin

```

  for r_emps in c_emps loop
    update employees set salary = salary + 60
      where current of c_emps;
  end loop;

```

end;

-----Wrong example of using where current of clause-----

```
declare
  cursor c_emps is select e.* from employees e, departments d
                    where
                      e.department_id = d.department_id
                      and e.department_id = 30 for update;
begin
  for r_emps in c_emps loop
    update employees set salary = salary + 60
      where current of c_emps;
  end loop;
end;
```

-----An example of using rowid like where current of clause-----

```
declare
  cursor c_emps is select e.rowid,e.salary from employees e, departments d
                    where
                      e.department_id = d.department_id
                      and e.department_id = 30 for update;
begin
  for r_emps in c_emps loop
    update employees set salary = salary + 60
      where rowid = r_emps.rowid;
  end loop;
end;
```

-----Refrance

Cursor-----

```
declare
  type t_emps is ref cursor return employees%rowtype;
  rc_emps t_emps;
  r_emps employees%rowtype;
begin
  open rc_emps for select * from employees;
  loop
    fetch rc_emps into r_emps;
    exit when rc_emps%notfound;
    dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name);
  end loop;
  close rc_emps;
end;
```

----- in two different queries-----

```
declare
  type t_emps is ref cursor return employees%rowtype;
  rc_emps t_emps;
  r_emps employees%rowtype;
begin
  open rc_emps for select * from retired_employees;
  loop
    fetch rc_emps into r_emps;
    exit when rc_emps%notfound;
```



```

        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name);
    end loop;
close rc_emps;

dbms_output.put_line('-----');

open rc_emps for select * from employees where job_id = 'IT_PROG';
loop
    fetch rc_emps into r_emps;
    exit when rc_emps%notfound;
    dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name);
end loop;
close rc_emps;
end;

```

-----Example of using with %type when declaring records first-----

```

declare
    r_emps employees%rowtype;
    type t_emps is ref cursor return r_emps%type;
    rc_emps t_emps;
    --type t_emps2 is ref cursor return rc_emps%rowtype;
begin
    open rc_emps for select * from retired_employees;
    loop
        fetch rc_emps into r_emps;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name);
    end loop;
close rc_emps;

dbms_output.put_line('-----');

open rc_emps for select * from employees where job_id = 'IT_PROG';
loop
    fetch rc_emps into r_emps;
    exit when rc_emps%notfound;
    dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name);
end loop;
close rc_emps;
end;

```

-----manually declared record type with cursors example-----

```

declare
    type ty_emps is record (e_id number,
                           first_name employees.last_name%type,
                           last_name employees.last_name%type,
                           department_name departments.department_name%type);
    r_emps ty_emps;
    type t_emps is ref cursor return ty_emps;
    rc_emps t_emps;
begin
    open rc_emps for select employee_id,first_name,last_name,department_name
                        from employees join departments using (department_id);
    loop
        fetch rc_emps into r_emps;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name||

```

```

        ' is at the department of : ' || r_emps.department_name );
    end loop;
    close rc_emps;
end;

```

-----first example of weak ref cursors-----

```

declare
    type ty_emps is record (e_id number,
                           first_name employees.last_name%type,
                           last_name employees.last_name%type,
                           department_name departments.department_name%type);

    r_emps ty_emps;
    type t_emps is ref cursor;
    rc_emps t_emps;
    q varchar2(200);
begin
    q := 'select employee_id,first_name,last_name,department_name
          from employees join departments using (department_id)';
    open rc_emps for q;
    loop
        fetch rc_emps into r_emps;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name||
                              ' is at the department of : ' || r_emps.department_name );
    end loop;
    close rc_emps;
end;

```

----- bind variables with cursors example-----

```

declare
    type ty_emps is record (e_id number,
                           first_name employees.last_name%type,
                           last_name employees.last_name%type,
                           department_name departments.department_name%type);

    r_emps ty_emps;
    type t_emps is ref cursor;
    rc_emps t_emps;
    r_depts departments%rowtype;
    --r t_emps%rowtype;
    q varchar2(200);
begin
    q := 'select employee_id,first_name,last_name,department_name
          from employees join departments using (department_id)
          where department_id = :t';
    open rc_emps for q using '50';
    loop
        fetch rc_emps into r_emps;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name||
                              ' is at the department of : ' || r_emps.department_name );
    end loop;
    close rc_emps;

    open rc_emps for select * from departments;
    loop
        fetch rc_emps into r_depts;
        exit when rc_emps%notfound;
    end loop;
end;

```

```

        dbms_output.put_line(r_depts.department_id|| ' ' || r_depts.department_name);
    end loop;
    close rc_emps;
end;

```

-----sys_refcursor example-----

```

declare
    type ty_emps is record (e_id number,
                           first_name employees.last_name%type,
                           last_name employees.last_name%type,
                           department_name departments.department_name%type);

    r_emps ty_emps;
-- type t_emps is ref cursor;
    rc_emps sys_refcursor;
    r_depts departments%rowtype;
--r t_emps%rowtype;
    q varchar2(200);
begin
    q := 'select employee_id,first_name,last_name,department_name
          from employees join departments using (department_id)
          where department_id = :t';
    open rc_emps for q using '50';
    loop
        fetch rc_emps into r_emps;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_emps.first_name|| ' ' || r_emps.last_name||
                              ' is at the department of : '|| r_emps.department_name );
    end loop;
    close rc_emps;

    open rc_emps for select * from departments;
    loop
        fetch rc_emps into r_depts;
        exit when rc_emps%notfound;
        dbms_output.put_line(r_depts.department_id|| ' ' || r_depts.department_name);
    end loop;
    close rc_emps;
end;

```