**BÀI 1**

Given the following purchases table that record all purchases of an online ecommerce store:

create table purchases (

id integer primary key,

user\_id integer,

product\_id integer,

created\_at timestamp without timezone

)

Please write a SQL query that show monthly unique buyers, broken down by first time buyers, and returned buyers.

A first time buyer is a buyer that hasn't made any purchase prior

A returned buyer is a buyer that has made at least 1 purchase prior

Your SQL should return 3 columns:

- month (date)

- first\_time\_buyers (integer),

- returned\_buyers (integer)

Please submit your work (SQL) and state the SQL database you're using (MySQL, PostgreSQL, SQL Server or any other DBs). You can provide any explanation if you want to.

Examples (data below has been simplified for ease of understanding, not how it is actually stored in the table, e.g. user\_id will only contain integer)

id | user\_id | product\_id | created\_at |

1 | alice | 1 | Jul 2016 |

2 | charlie | 1 | Jul 2016 |

3 | alice | 2 | Aug 2016 |

4 | bob | 3 | Aug 2016 |

5 | david | 3 | Aug 2016 |

6 | bob | 2 | Sep 2016 |

7 | bob | 3 | Sep 2016 |

8 | david | 3 | Sep 2016 |

Expected results:

| month | first\_time\_buyers | returned\_buyers |

| 2016-07-01 | 2 | 0 |

| 2016-08-01 | 2 | 1 |

| 2016-09-01 | 0 | 2 |

**TEST DATA**

create database MyERP

go

use MyERP

go

create table purchases (

  id integer primary key IDENTITY(1,1),

  user\_id integer,

  product\_id integer,

  created\_at datetime

)

insert into purchases values (2, 2, '2016-07-10');

insert into purchases values (9, 3, '2016-07-17');

insert into purchases values (1, 4, '2016-07-18');

insert into purchases values (1, 2, '2016-07-20');

insert into purchases values (2, 5, '2016-07-21');

insert into purchases values (1, 4, '2016-07-25');

insert into purchases values (1, 3, '2016-07-25');

insert into purchases values (5, 2, '2016-07-25');

insert into purchases values (1, 1, '2016-07-25');

insert into purchases values (1, 2, '2016-09-25');

insert into purchases values (2, 2, '2016-09-10');

insert into purchases values (1, 3, '2016-09-17');

insert into purchases values (1, 4, '2016-09-18');

insert into purchases values (4, 2, '2016-09-20');

insert into purchases values (1, 5, '2016-09-21');

insert into purchases values (5, 4, '2016-09-21');

insert into purchases values (1, 1, '2016-09-21');

insert into purchases values (1, 3, '2016-09-21');

insert into purchases values (1, 2, '2016-08-20');

insert into purchases values (2, 2, '2016-08-10');

insert into purchases values (3, 3, '2016-08-17');

insert into purchases values (1, 4, '2016-08-18');

insert into purchases values (2, 5, '2016-08-21');

insert into purchases values (1, 4, '2016-08-25');

insert into purchases values (1, 1, '2016-08-25');

insert into purchases values (1, 3, '2016-08-25');

insert into purchases values (1, 2, '2016-08-25');

insert into purchases values (1, 2, '2016-01-25');

insert into purchases values (1, 4, '2017-01-10');

**RESULT LIKE THIS**

YYYY-MM-DD    FIRST-TIME\_BUYERS    RETURNED\_BUYERS

2016-01-01    1   0

2016-07-01    3   1

2016-08-01    1   2

2016-09-01    1   3

2017-01-01    0   1

**BÀI 2**

create database Hacker\_rank  
use hacker\_rank  
  
create table project (  
 task\_id int primary key,  
 start\_date smalldatetime,  
 end\_date smalldatetime  
)  
  
set dateformat ymd  
  
insert into project values(1, '2015-10-01', '2015-10-02');  
insert into project values(2, '2015-10-02', '2015-10-03');  
insert into project values(3, '2015-10-03', '2015-10-04');  
insert into project values(4, '2015-10-13', '2015-10-14');  
insert into project values(5, '2015-10-14', '2015-10-15');  
insert into project values(6, '2015-10-28', '2015-10-29');  
insert into project values(7, '2015-10-30', '2015-10-31');

Bảng Project chứa các task của project. Những task nào có ngày kết thúc bằng ngày bắt đầu của task khác thì chúng thuộc cùng một project.

Hãy liệt kê project, thời lượng, ngày bắt đầu với kết quả được sắp xếp theo thời lượng tăng dần, ngày bắt đầu giảm dần.