**COMP 3005**

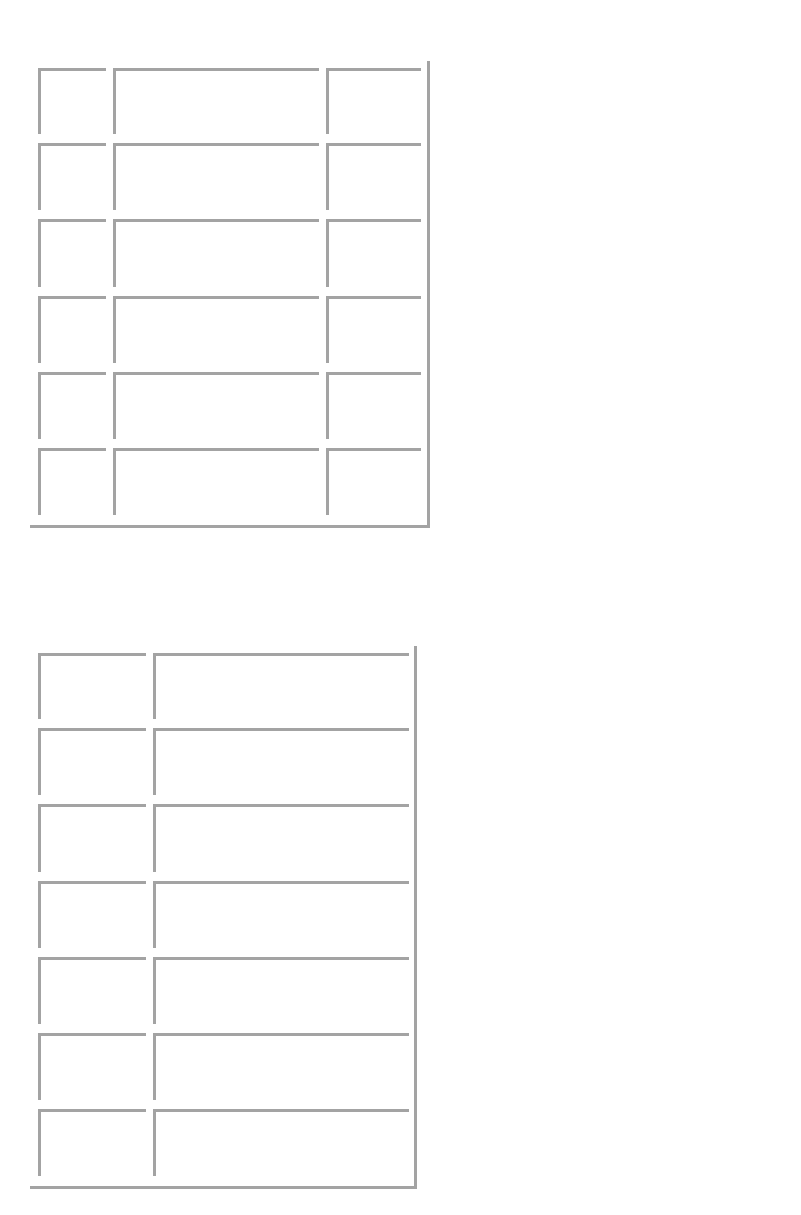
**Assignment #1**

**Instruction**

1. You should do the assignments independently. Copying is not allowed
2. Submit your assignment as a single word/PDF document on culearn.

**Queries (70 marks)**

Given the **Person-Hobby** database shown below. Use relational algebra (ALG) to expression the following queries. Submit your query expressions as well as the query results for each query. Each query is 4 marks and the result is 1 mark.



**Person**

**P**

**#**

**Name**

**Age**

P

1

Smith

20

P

2

Jones

30

P

3

Blake

25

P

4

*Lastname*

20

P

5

Adams

30

**Hobby**

**H**

**#**

**Name**

H

1

Bowling

H

2

Chess

H3

Dancing

H

4

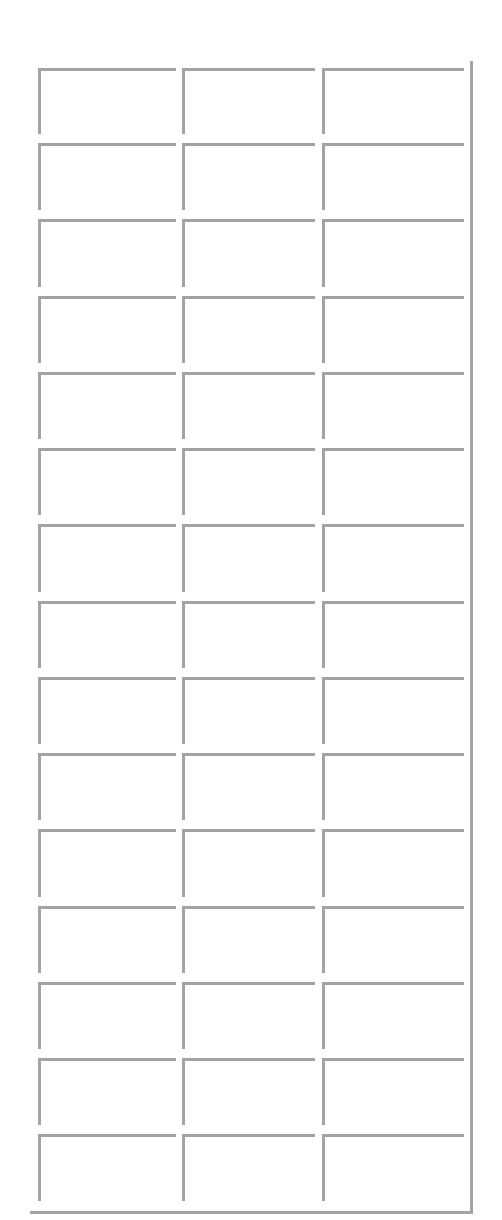
Hiking

H5

Skating

H6

Ski



**Play**

**P**

**#**

**H**

**#**

**Times**

P

1

H

1

3

P

1

H

2

2

P

1

H

3

4

P

1

H

4

2

P

1

H

5

1

P

1

H

6

1

P

2

H

1

3

P

2

H

2

4

P

2

H3

5

P

2

H

4

2

P

3

H

2

2

P

3

H

3

3

P

4

H2

3

P

4

H3

4

As Person and hobby both have Name, cannot njoin Person, Play and Hobby. If so deduct 1 mark for the answer. Note there are many different ways for each query.

1. Get the names of hobbies that “*lastname*” plays.

T1:= SELECT NAME='Lastname' (PERSON NJOIN PLAY)

T2:= PROJECT H# (T2)

PROJECT NAME (HOBBY NJOIN T2)

T1:= RENAME PERSON to PERSON(P#,Pname,Age)

T2 := T1 NJOIN PLAY NJOIN HOBBY

PROJECT NAME (SELECT PNAME =”Lastname” (T2))

NAME

--------------------

CHESS

DANCING

1. Get the names of persons who play Bowling.

T1 := PROJECT P# (SELECT NAME='Bowling' (HOBBY NJOIN PLAY)

PROJECT NAME (PERSON NJOIN T1)

NAME

---------------

Smith Jones

1. Get the names of persons who play a hobby more than 3 times.

T1:= PROJECT P# (SELECT TIMES>3 (HOBBY NJOIN PLAY)

PROJECT NAME (PERSON NJOIN T1)

NAME

--------------

Smith

Jones

Lastname

1. Get the names of persons who play either chess or dancing.

T1:= PROJECT P# (SELECT NAME='Chess' OR NAME='Dancing' (PLAY NJOIN HOBBY)

PROJECT NAME (PERSON NJOIN T1)

NAME

----------------

Smith

Jones

Blake

Lastname

1. Get the names of persons who play both chess and dancing.

T1 := PROJECT H# (SELECT NAME='Chess' OR NAME='Dancing' (HOBBY));

T2 := PROJECT P#, H# (PLAY);

T3 := T2 DIVIDEBY T1;

PROJECT NAME (PERSON NJOIN T3)

NAME

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Smith

Jones

Blake

Lastname

1. Get the person name/hobby name pairs such that the indicated person plays the indicated hobby.

T1(P#, HNAME) := PROJECT P#, NAME (PLAY NJOIN HOBBY) PROJECT NAME, HNAME (PERSON NJOIN T1)

NAME HOBBYNAME

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Smith, Bowling

Smith, Chess

Smith, Dancing

Smith, Hiking

Smith, Skating

Smith, Ski

Jones, Bowling

Jones, Chess

Jones, Dancing

Jones, Hiking

Blake, Chess

Blake, Dancing

Lastname, Chess

Lastname, Dancing

1. Get the names of persons who do not play Ski.

T1 := PROJECT P# (SELECT NAME='Ski' (PLAY NJOIN HOBBY))

T2 := PROJECT P# (PERSON)

T3 := T2 MINUS T1;

PROJECT NAME (PERSON NJOIN T3)

NAME

---------------- Jones

Blake

Lastname Adams

1. Get the names of persons who do not play any hobby.

T1 := PROJECT P# (PERSON)

T2 := PROJECT P# (PLAY)

T3 := T1 MINUS T2

PROJECT NAME (PERSON NJOIN T3)

NAME

----------

Adams

1. Get the names of persons who play all hobbies.

T1 := PROJECT P#,H# (PLAY)

T2 := PROJECT H# (HOBBY)

T3 := T DIVIDEBY T2

PROJECT NAME (PERSON NJOIN T3)

NAME

----------

Smith

1. Get the names of persons who play all hobbies that “*lastname*” plays.

T1 := PROJECT H# (SELECT NAME='Lastname' (PLAY NJOIN PERSON))

T2 := PROJECT P#, H# (SELECT NAME!='Lastname' (PLAY NJOIN PERSON))

T3 := T2 DIVIDEBY T1

PROJECT NAME (PERSON NJOIN T3)

NAME

----------------

Smith

Jones

Blake

1. Get the names of persons who play only all the hobbies that “*lastname*” plays.

-- H# for hobbies that that “*lastname*” plays

T1 := PROJECT H# (SELECT NAME='Lastname' (PLAY NJOIN PERSON)) -- P#,H# without “*lastname*”

T2 := PROJECT P#, H# (SELECT NAME!='Lastname' (PLAY NJOIN PERSON))

-- P# for persons who play all hobbies with H# in T1

T3 := PROJECT P# (T2 DIVIDEBY T1);

PROJECT NAME (PERSON NJOIN T3)

NAME

--------------- Blake

1. Get the names of persons who play all hobbies except Skating and Ski.

-- P# for persons who play Skating or Ski

T1 := PROJECT P# (SELECT NAME='Skating' OR NAME='Ski' (HOBBY NJOIN PLAY)

-- H# for hobbies other than Skating and Ski

T2 := PROJECT H# (SELECT NAME!= 'Skating' OR NAME='Ski' (HOBBY)

T3 := PROJECT P#, H# (PLAY);

-- P# for persons who play all hobbies in T2

T4 := T3 DIVIDEBY T2;

-- Exclude persons in T1

T5 := T4 - T1;

PROJECT NAME (PERSON NJOIN T5)

NAME

----------------

Jones

1. Get the names of persons, the number of hobbies and total number of times they play those hobbies.

T1(P#, HOBBYCNT, TOTALNO) := AGGREGATE P#, COUNT(\*), SUM(TIMES) (PLAY); PROJECT NAME, HOBBYCNT, TOTALNO (PERSON NJOIN (T1)

NAME HOBBYCNT TOTALNO

----------------------------------------------------- Smith 6 13

Jones 4 14

Blake 2 5 Lastname 2 7

1. Get the names of persons who play hobbies but play the least number of hobbies.

-- GET THE NUMBER OF HOBBYS EACH PERSON PLAYS

T1(P#, HOBBYCNT) := AGGREGATE P#, COUNT(\*) (PLAY);

-- GET THE LEAST AMOUNT OF HOBBYS THAT WHERE CHECKED OUT:

PROJECT NAME (SELECT MIN(HOBBYCNT)(PERSON NJOIN T1))

NAME

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Blake

Lastname