159.202 Assignment 1

Deadline:	**Anytime before: Saturday 25 July 2015, time due 23:59**
Evaluation:	10 marks – which is 3% of your final grade
Late Submission:	5 % per hour (or fraction of hour) it is late
Purpose:	Practice with Prolog facts, rules and queries.

Write all your answers in a file a1.pl.
The answers for Part2 ii), Part 3 ii) and Part 4 iv) should be written as comments.

Part 1. (1 mark) Write a rule output, such that when used it will display your ID(s) and name(s) on screen (see Figure 1 for an example).

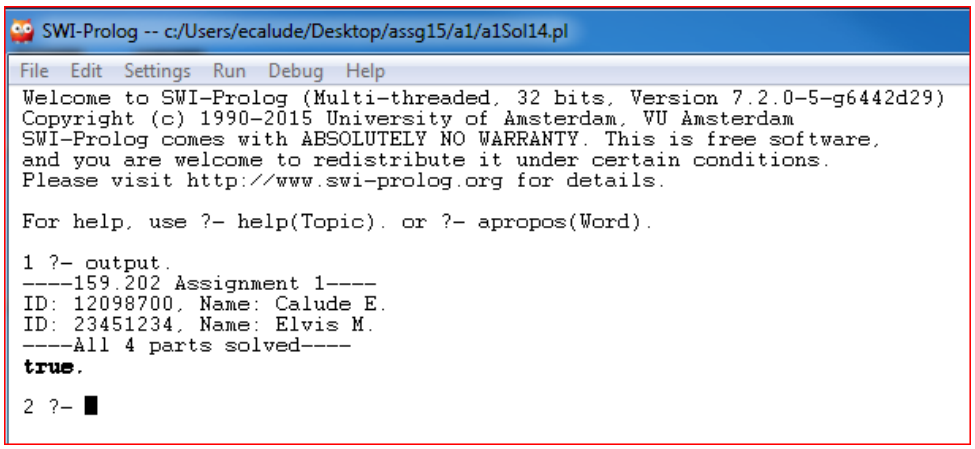

Figure 1-display the IDs and names on screen.

Part 2. (3 marks) Given the following facts

```
likes(tom,jerry).
likes(mary,john).
likes(mary,mary).
likes(tom,mouse).
likes(jerry,jerry).
likes(jerry, cheese).
likes(mary,fruit).
likes(john,book).
likes(mary,book).
likes(tom,john).
```

i) Convert the rules below to Prolog and add them to the knowledge base.
   a) John likes anything that Mary likes
   b) John likes anyone who likes cheese

ii) Formulate Prolog queries for the following questions:
   a) Who/what does Mary like?
   b) Who/what does John like?
   c) Who likes books?

Part 3. (3 marks)
Consider the following Prolog program.

```
% Some Greek gods
male(apollo).
male(ares).
male(cronus).
male(coeus).
male(hades).
male(hephaestus).
male(oceanus).
male(poseidon).
male(uranus).
male(zeus).
% Some Greek goddesses
female(aphrodite).
female(artemis).
female(demeter).
female(gaea).
female(hera).
female(hestia).
female(leto).
female(phoebe).
female(rhea).

%parents(person, father, mother)
parents(apollo, zeus,leto).
parents(cronus,uranus,gaea).
parents(coeus, uranus, gaea).
parents(ares, zeus,hera).
parents(phoebe, uranus, gaea).
parents(hestia,cronus,rhea).
parents(poseidon,cronus,rhea).
parents(hades,cronus,rhea).
parents(zeus,cronus,rhea).
parents(demeter,cronus,rhea).
parents(oceanus, uranus, gaea).
parents(hebe, zeus,hera).
parents(hephaestus, zeus,hera).
parents(artemis, zeus,leto).
parents(rhea, uranus,gaea).

brother(Person1, Person2):-male(Person1),
      parents(Person1, Father, Mother),
      parents(Person2, Father, Mother), Person1 \= Person2.
```

i) Define and add to the above database the predicates below and any additional facts required:

a) `sister(Person1, Person2)`
b) `aunt(Person,Aunt).`
c) `son(Person,Father).`

ii) Answer, using the database you obtained after completing i), the following questions:
   a) Who are Apollo's aunts?
   b) Who are Zeus' sons?

Part 4 (3 marks)

You will write a Prolog program for your new venture-a dating agency. Assume you have the following information about people who want to use your company.

Anna is a petite blond woman who would like to be introduced to a man. Eve is a brunette, 155 cm tall woman who would like to meet any man who would be keen on her. Julie, the red-haired lady is 165 cm tall and is looking to find a man taller than she. Carmela is a 159 cm tall, blonde lady who does not know what she wants. Luc is 170 cm tall and is interested in red-haired women. Max likes small, brunette women. Marc measures 190cm and would love to meet a brunette. Hector is looking for a small blonde.

Write a Prolog program to help these people to find their matches. Assume that small/petite means less than 1.60m.
To do:

i) Write the following facts:
   a) `woman/1`, to record every woman mentioned above
   b) `man/1`, to record every man mentioned above
   c) `height/2`, record people and their heights
   d) `hair/2`, to record women and their hair-colour

ii) Write the following rules:
   a) `petite/1`, which succeeds when is Anna or is shorter than 160cm
   b) `prefers/2`, which for each man and each woman it records his/her preferences,

   For example

```
prefers(max, Female) :- woman(Female) ,
                        petite(Female),
                        hair(Female, brunette).
```

iii) Write the rule
   `match/2`, which succeeds when the two people-arguments prefer each others.

iv) Formulate a Prolog query to find how to pair people mentioned above and write the answer given to the query by your program.

Important:

1. You can define and use extra predicates in order to solve a problem. Use only the material covered in lectures or in the Notes (Stream); solutions using material not covered in lectures or in Notes will get 0 marks.
2. The assignment can be done individually or in teams of at most 2 students (see Pair programming document on Stream). All assignments authored by 3 or more students will get 0 marks.
3. Please note that if we cannot run your `a1.pl` you will get 0 marks.
4. As sample solutions will be presented in next day lecture no extension will be possible.

If you have any questions about this assignment, please ask the lecturer before its due time!

Submit your file *a1.pl* electronically via Stream