

**Your answers to this question should be submitted in one file called `listAnswers.pl`. Start Sicstus Prolog in a new terminal window so that you will have none of the clauses from question 1.**

Write Prolog programs for the following relations and add them to your **`listAnswers.pl`** file. Do not use any Prolog list processing built-in functions except, if required, ***`member`***, ***`append`*** and ***`length`***. You can use ***`setof`*** and the cut, ***`!`***. You can also use Prolog's negation operator ***`!`***, if needed, together with any arithmetic primitives you may need (e.g. ***`<`***, ***`>`***).

**i) `remove_item(E, L, NewL)`**

**`NewL`** is the list that results from removing all occurrences of element **`E`** from list **`L`**. If **`E`** does not occur in **`L`** then **`NewL=L`**.

Example: the query **`remove_item(a, [a,b,r,a,c,a,d,a,b,r,a], NewL)`** should return **`NewL= [b,r,c,d,b,r]`**.

**ii) `drop_items(L, N, NewL)`**

**`NewL`** is list **`L`** with its first **`N`** elements deleted. If **`L`** is shorter than **`N`** then **`NewL`** is the empty list. You can assume that in all calls to **`drop_items`** **`N`** is always a natural number (i.e. **`N`** is one of 0,1,2,3, ...).

Example: the query **`drop_items([1,4,7,1], 2, NewL)`**

should return **NewL**=[7,1].

**iii) drop\_more\_items(L, N, NewL)**

**NewL** is the result of first removing the first **N** elements from list **L** and then removing all occurrences of these first **N** elements from the rest of the list. If **L** is shorter than **N** then **NewL** is the empty list. As before, you can assume that in all calls to **drop\_more\_items** **N** is a natural number.

Example: the query **drop\_more\_items([1,4,7,1], 2, NewL)**  
should return **NewL**=[7].

**iv) count(L, Result)**

**L** is a list of elements, and **Result** is a list of all items of the form **(I, Num)**, where **I** is an element in **L** and **Num** is the number of times **I** occurs in **L**. The list **Result** should have no repetitions. You can assume that in all calls to **count** **L** is given and **Result** is to be computed.

Example: the query **count([a,b,a,b,c,d], X)**  
should return **X** = [(d,1),(c,1),(b,2),(a,2)].  
The order of the items in **X** is not important.

*Questions 1 and 2 have 50% and 50% of the total marks, respectively.*