

Worth: 10% (together with part II of this assignment)

Due: By 1pm on Wednesday 8 April

For all of your answers, you are expected to use good Prolog style (in particular, make appropriate use of unification, helper predicates, and cut) including good external and internal comments (to explain the purpose of your code and your decisions on how to implement it), as well as good visual layout (formatting, indenting, blank lines) to make your code easy to read and understand.

For each question below, predicates will be described using the notation introduced in class, *i.e.*, parameters preceded by a “+” must be instantiated, parameters preceded by a “-” must not be instantiated, and parameters preceded by a “?” may or may not be instantiated, in order for the computation to produce correct results.

1. Write a predicate `range(+List,?Min,?Max)` that succeeds iff `Min` is the smallest number in `List` and `Max` is the largest number in `List`. Your predicate should succeed even for lists that contain elements other than numbers (except for variables), but it should *not* succeed if `List` contains no number at all.

For example,

```
?- range([a,5,6,b,12,5,c,2.5], Min, Max).

Min = 2.5,
Max = 12
```

Note that in Prolog, the predicate `number(X)` succeeds iff `X` is instantiated to a number (integer or floating-point).

Submit your code for this question in file “`range.pl`”.

2. Write a predicate `uniquify(+L0,?L1)` that succeeds iff the list `L1` contains the same elements as the list `L0`, in the same order, except for duplicate values—you may remove duplicates from the front or the back of the list, whichever way is easier.

For example,

```
?- uniquify([a,b,3,c,a,4,b,3,a,c,2,3,c,4], L).

L = [b, a, 2, 3, c, 4]
```

Submit your code for this question in file “`uniquify.pl`”.

3. Write a predicate `flatten(+L0,?L1)` that succeeds iff list `L1` contains every element from inside list `L0`, in the same order, even those inside sub-lists (at all nesting levels).

For example,

```
?- flatten([[1,2],blah,['hello',[[ ],1]]], L).

L = [1, 2, blah, hello, 1]
```

Submit your code for this question in file “`flatten.pl`”.

More questions coming soon in part II...