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Abstract Machines

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11. Homework *Deadline: 14 July 2004 12:00*

Exercise 1: *7 Points*

Clause Indexing: Take a look at the following predicate $p/2$. Which alternatives can be excluded by inspecting the first argument X ? Show the different **try chains** considering the possible values of X.

```
p(X,Y) <- X=a.
p(X,Y) <- q(Y),X=b.
p(X,Y) <- r(X,Y).
p(X,Y) <- X=f(Y).
p(X,Y) <- Y=a,r(Y,Y).
```

Exercise 2: *3 Points*

Assume given definitions of two predicates $p/1$ and $q/1$. Use the cut operator to define a predicate $r/1$ such that $r(X)$ holds exactly when either $p(X)$ or $q(X)$ holds, but not both.

Exercise 3: *10 Points*

Recall the predicate $remove/3$ of exercise sheet 6. The third parameter is obtained from the second parameter, which is a list, by removing all occurrences of the first parameter.

a) Define this predicate using the cut operator.
b) Translate this predicate, together with the query $remove(a, [b, a, c], Z)$, to WiM code.
c) Execute the WiM code showing the sequence of (sub-)goals that are called and the stack and the heap after each of these goals has been processed. Where is backtracking done ?