

```
algol,n<
begin
  comment
```

Find a solution for the N queen problem.

nqueen18.asc

| N  | Solutions | Time    |
|----|-----------|---------|
| 4  | 2         | 0.30    |
| 5  | 10        | 0.75    |
| 6  | 4         | 2.24    |
| 7  | 40        | 7.84    |
| 8  | 92        | 29.82   |
| 9  | 352       | 121.93  |
| 10 | 724       | 526.09  |
| 11 | 2680      | 2482.02 |

No buffer, N=12:

|               |                  |
|---------------|------------------|
| Time classic: | 13968.89         |
| Time turbo:   | 12368.89 11.5pct |

Buffer, N=12:

|               |                  |
|---------------|------------------|
| Time classic: | 14069.38         |
| Time turbo:   | 12469.37 11.4pct |

;

```
integer N, MAXN, nsolutions;
boolean empcol;
boolean empup;
boolean empdo;
boolean one, zero;
integer i;
real clock;
real procedure clock count;
code clock count;
1, 37;
  z1          , grf p-1  ; RF:=clock count; stack[p-1]:=RF;
e;
procedure set(x);
value x;
integer x;
begin
  integer y;
  boolean mask;
  y:=0;
  mask:=empcol ^ (empdo shift x) ^ (empup shift (-x));
  for y := y while 0 $\neq$ integer mask do
  begin
    code mask,y, zero;
    3, 46;
    3, 44;
    2, 46;
    arn pa1,nk rel
    tk 1,mb a3
    gr pa1
    srn rel,ck 10
    ar pa2,ar c42
    gr pa2 V
e1:   qq
      e;
```

```

    if x = N then
        nsolutions:=nsolutions+1
    else
    begin
        empcol := empcol  $\wedge$  (zero shift (-y));
        empup := empup  $\wedge$  (zero shift (x-y));
        empdo := empdo  $\wedge$  (zero shift (-x-y));
        set(x+1);
        empcol := empcol  $\vee$  (one shift (-y));
        empup := empup  $\vee$  (one shift (x-y));
        empdo := empdo  $\vee$  (one shift (-x-y))
    end
    end
end set;

MAXN := 12;    comment maximum size;
one := 1 1 39 0;
zero := 1 0 39 m;
for N:=4 step 1 until MAXN do
begin
    nsolutions:=0;
    select(17);
    writecr;
    writetext( $\langle$ looking onto a  $\rangle$ );
    writeinteger( $\langle$ p $\rangle$ ,N);
    writetext( $\langle$  x  $\rangle$ );
    writeinteger( $\langle$ p $\rangle$ ,N);
    writetext( $\langle$  chessboard... $\rangle$ );
    writecr;
    clock count;
    empcol:=empup:=empdo:=false;
    for i := 1 step 1 until N do
    empcol := empcol  $\vee$  (one shift -i);
    for i := -N+1 step 1 until N-1 do
    empup := empup  $\vee$  (one shift -i);
    for i := 2 step 1 until 2*N do
    empdo := empdo  $\vee$  (one shift -i);

    set(1);

    if nsolutions=0 then
    writetext( $\langle$ NO SOLUTION. $\rangle$ )
    else
    begin
        clock := clock count;
        writeinteger( $\langle$ p $\rangle$ ,nsolutions);
        writetext( $\langle$  solutions. $\rangle$ );
        writecr;
        writetext( $\langle$ Time:  $\rangle$ );
        write( $\langle$ ddddddd.dd $\rangle$ ,clock)
    end;
    writecr
end;
    writetext( $\langle$ done. $\rangle$ );
    writecr;
    N:=N;
end;
t<

```