Symbolisches Differenzieren am Beipiel eines FORTRAN-Programms

```
      FUNCTION F(X)
      A=1.0
      B=COS(X)
      DO 1 N=1,5
      D=B
      B=SQRT(A*B)
      A=(A+D)/2.D0
    1 CONTINUE
      F=2.0*ATAN(1.0)/A
      RETURN
      END
```

```
      FUNCTION DF(X)
      DA=0.0
      A=1.0
      DB=-SIN(X)
      B=COS(X)
      DO 1 N=1,5
      DD=DB
      D=B
      DB=0.5*(DA*B+A*DB)/SQRT(A*B)
      B=SQRT(A*B)
      DA=(DA+DD)/2.0
      A=(A+D)/2.D0
    1 CONTINUE
      DF=-2.0*ATAN(1.0)*DA/A**2
      F=2.0*ATAN(1.0)/A
      RETURN
      END
```