5. **Bessel Function I, Series Expansion**

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**Comment**  Compute the Bessel function $I_n(x)$ when $n$ and $x$
are within the bounds of the series expansion.
The procedure calling statement gives $n$, $x$ and an
absolute tolerance $\delta$ for determining the point at
which the terms of the summation become insigni-
ficant. Special case: $I_0(0) = 1$;

**Procedure**  $I(n, x, \delta) = (\delta)$

```
begin
1:  s := 0  ;  sum := 0
if (n ≠ 0)  ;  go to STRT
if (X = 0)  ;  begin Is := 1  ;  return end
summ := 1  ;  go to SURE
STRT:  sfac := 1
if (s = 0)  ;  go to HRE
for t := 1 (1) s
  sfac := sfac × t
HRE:  snfac := sfac
for t := s + 1 (1) s + n
  snfac := snfac × t
  summ := summ + (X/2)×exp(-(sfac × snfac))
SURE:  if ($\delta < \text{abs}(\text{summ} - \text{sum})$)
begin s := s + 1  ;  sum := summ  ;  go to STRT end
Is := summ  ;  return
end
```