```
> # Prof. Dr. Serkan Dağ
  # ME 310 Numerical Methods
  # File 1.1
  # Maclaurin series of the exponential function
  # True and approximate errors
> restart :
  unprotect(sum) :
  Digits := 10 :
> # Number of significant figures and percent tolerance
> n := 3 :
  eps_s := 0.5·10^(2 − n);
  eps_a := 1 :
```

$$eps\_s := 0.05000000000 \quad (1)$$

```
> # True value
> t_v := exp(0.5) :
> sump := 1 :
  k := 1 :
> # Initiate the iterations
> while eps_a > eps_s do
  sum := sump + x^k/k! :
  prev := subs(x = 0.5, sump) :
  curr := subs(x = 0.5, sum) :
  eps_t := abs((t_v − curr)/t_v)·100 :
  eps_a := abs((curr − prev)/curr)·100 :
  sump := sum :
  k := k + 1 :
  printf("\n %5.1f %15.10f %10.5f %10.5f", k, curr, eps_t, eps_a) :
  end do:
```

```
 2.0    1.5000000000    9.02040   33.33333
 3.0    1.6250000000    1.43877    7.69231
 4.0    1.6458333330    0.17516    1.26582
 5.0    1.6484375000    0.01721    0.15798
 6.0    1.6486979170    0.00142    0.01580
>
```