```
// T44mixDesExp.sce
// MIXTURE ESTIMATION (descriptive, exponential)
// - static componens
// Experiments
// - change simulated parameters
// - change initial parameters
// ---------------------------------------------------------------------
exec("ScIntro.sce",-1),
getd(), mode(0)

nd=500;                                                          // 1
// PARAMETERS                                                    // 2
aS=[1 3 2 5];                          // simulated comp. expectations // 3
nc=length(aS);                         // number of components        // 4
alS=[.1 .2 .4 .3];                     // parameters of pointer model // 5
                                                                 // 6
// SIMULATION                                                    // 7
for t=1:nd                                                       // 8
  jS=sampCat(alS);                     // pointer value               // 9
  cS(t)=jS;                            // stor pointer value          // 10
  y(t)=-log(randu())/aS(jS);           // output                      // 11
end                                                              // 12
                                                                 // 13
```

```
// ESTIMATION                                                    // 14
// initialization                                               // 15
aE=[1 5 3 10];                                                  // 16
ka=[1 1 1 1];                          // initial counter       // 17
S=ka./aE;                                                       // 18
                                                                // 19
// time loop of estimation                                      // 20
th=aE;                                                          // 21
for t=1:nd                                                      // 22
  for j=1:nc                                                    // 23
    q(j)=aE(j)*exp(-aE(j)*y(t));       // proximity             // 24
  end                                                           // 25
  w=q/sum(q);                          // weights               // 26
  wt(:,t)=w;                           // remember weights      // 27
  for j=1:nc                                                    // 28
    S(j)=S(j)+w(j)*y(t);               // update of inf. matrix // 29
    ka(j)=ka(j)+w(j);                  // update of counter     // 30
    aE(j)=ka(j)/S(j);                  // point estimates       // 31
  end                                                           // 32
  th=[th; aE];                        // remember point estimates // 33
end                                                             // 34
                                                                // 35
// RESULTS                                                      // 36
```

```
tx=['b';'r';'g';'k'];                                                    // 37
set(scf(1),'position',[600 10 600 400])   // evolution of par. est.     // 38
for j=1:nc                                                               // 39
  plot(th(:,j),'-'+tx(j))                                                // 40
end                                                                      // 41
title 'Evolution of the estimated parameters'                            // 42
legend('c1','c2','c3','c4');                                             // 43
                                                                         // 44
disp 'The final parmeter estimates are'                                  // 45
disp(aE)                                                                 // 46
                                                                         // 47
[nill,cp]=max(wt,'r');                    // accuracy of classification // 48
disp 'Accuracy of classification'                                        // 49
ACC=acc(cS,cp)                                                           // 50
```

Description of the program

The distribution of the components (denoted by j) is exponential one

$$f_j\left(y_t|a_j\right) = a_j \exp\left(-a_j y_t\right)$$

For the definition of statistics, their update and computation of parameter estimates see Section XXX.

- Rows 3–5 define model parameters for simulation.
- Rows 8–12 perform output simulation
- Rows 16–18 set initial parameters and corresponding statistics.
- Rows 21–35 perform the time loop for estimation.
  - Rows 23–25 compute component proximities.
  - Rows 26–27 construct the weights w.
  - Rows 28–32 perform statistics update and construct estimates of the parameters.