



Initialization:

$T_0 = 0.95$; $T_f = 0.1$; $\text{MaxIter} = 100$;

$\Delta = (T_0 - T_f) / (\text{MaxIter}) = 0.0085$;

$T = T_0$;

$\text{iter} = 1$;

Initial solution construction phase:

//Generate an initial solution at random

//Note that a solution is represented as a sequence of cities (path)

Sol = C-B-A-D-E-C

$f(\text{Sol}) = 6+2+4+3+5 = 20$

Solbest = Sol = C-B-A-D-E-C

$f(\text{Solbest}) = f(\text{Sol}) = 20$

Improvement phase:

//in the do while loop

do while (iter <=MaxIter)

//generate a new solution using a swap
neighbourhood structure i.e., swap.

Assume we swap between cities A and C in the
Sol = C-B-A-D-E-C.

First iteration

$Sol^* = A-B-C-D-E-A;$

$f(Sol^*) = 1+6+4+1+3=15$

if $f(\text{Sol}^*)$ better than $f(\text{Sol})$ // $15 < 20 \rightarrow \text{true}$

$\text{Sol} = \text{Sol}^* = \text{A-B-C-D-E-A}$

$f(\text{Sol}) = f(\text{Sol}^*) = 15$

if $f(\text{Sol}^*)$ better than $f(\text{Solbest})$

$\text{Solbest} = \text{Sol}^* = \text{A-B-C-D-E-A}$

$f(\text{Solbest}) = f(\text{Sol}^*) = 15$

//Update T

$T = T - \text{Delta} = 0.95 - 0.0085 = 0.9442$

Second iteration:

Sol = A-B-C-D-E-A

Sol* = A-B-D-C-E-A //swap between C and D

$f(\text{Sol}^*) = 1+2+5+5+3 = 16$

if $f(\text{Sol}^*)$ better than $f(\text{Sol})$ //16 < 15)

....

else

$c = f(\text{Sol}^*) - f(\text{Sol}) = 16-15 = 1$

generate a random number, r [0,1]

// assume $r = 0.00000007$

if $\exp(-c/T) > r$

//assume $\exp(-1/0.9442) = 0.000013$

$0.000013 > 0.000000007 \Rightarrow \text{true}$

then

$\text{Sol} = \text{Sol}^* = \text{A-B-C-D-E-A}$

$f(\text{Sol}) = f(\text{Sol}^*) = 16$

else

$\text{Sol} = \text{Sol}$

$T = T - \Delta = 0.9442 - 0.0085 = 0.9357;$

Third iteration:

Sol = A-B-D-C-E-A

Sol* = A-C-D-B-E-A //swap between B and C

$f(\text{Sol}^*) = 7+4+2+5+3 = 21$

if $f(\text{Sol}^*)$ better than $f(\text{Sol})$ //21 < 16)

....

else

$c = f(\text{Sol}^*) - f(\text{Sol}) = 21-16 = 5$

generate a random number, r [0,1]

// assume $r = 0.00023$

if $\exp(-c/T) > r$

//assume $\exp(-6/0.9357) = 0.00046$

// $0.00046 > 0.00023 \Rightarrow \text{true}$

then

$\text{Sol} = \text{Sol}^* = \text{A-C-B-D-E-A}$

$f(\text{Sol}) = f(\text{Sol}^*) = 21$

else

...

$T = T - \Delta = 0.9357 - 0.0085 = 0.9272;$

