

```

procedure SGA( $f : \mathbb{X} \mapsto \mathbb{R}^+$ ,  $ps$ ,  $cr$ )                                ▷ for maximization!
   $x_B \leftarrow \emptyset$ ;  $y_B \leftarrow -\infty$ ;                                ▷ best-so-far solution
  for  $j \in 1 \dots ps$  do                                                    ▷ random initial population
    randomly sample  $S_0[j].x$  from  $\mathbb{X}$ ;  $S_0[j].y \leftarrow f(S_0[j].x)$ ;

  for  $i \in 0 \dots \infty$  do                                                    ▷ iterate “generations”
    for  $j \in 1 \dots ps$  do                                                    ▷ new pop. via mutation and crossover
      if  $\mathfrak{R}_0^1 < cr$  then  $N_i[j].x \leftarrow \text{binary}(S_i[\lfloor \mathfrak{R}_i^{ps} \rfloor].x, S_i[\lfloor \mathfrak{R}_i^{ps} \rfloor].x)$ ;
      else  $N_i[j].x \leftarrow \text{move}(S_i[\lfloor \mathfrak{R}_i^{ps} \rfloor].x)$ ;
       $N_i[j].y \leftarrow f(N_i[j].x)$ ;

   $S_{i+1} \leftarrow$  Roulette Wheel: select  $ps$  records from  $P_i = S_i \cup N_i$ 
    such that, for each of the  $ps$  slots, the probability
    of  $P_i[j]$  to be chosen is proportional to  $P_i[j].y$ .

```