$$\begin{bmatrix} a_{11} & a_{12} & \dots & a_{1K} \\ a_{21} & a_{22} & \dots & a_{2K} \\ \vdots & a_{K2} & \ddots & \vdots \\ a_{K1} & a_{K2} & \dots & a_{kk} \end{bmatrix} * \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_K \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_K \\ \vdots \end{bmatrix} \tag{1}$$

```
for(int i=1; i<10;i++)
{

cout << "i=" << i;

}
```

for i=0,...,10 **do**
`cout<<"i="'<<i;`
end for

$$\lim_{n\to\infty} \sum_{k=1}^{\infty} \frac{1}{k^2} = \frac{\pi_2}{6} \tag{2}$$

$$[x]_A = \{y \in U : a(x) = a(y), \forall a \in A\}, x \in U \tag{3}$$

$$cos(20) = cos^2 0 - sin^2 0 \tag{4}$$

$$(a_1 = a_1(x)) \wedge (a_2 = a_2(x)) \wedge \ldots \wedge (a_k = a_k(x)) \Rightarrow (d = d(u)) \tag{5}$$

$$[x]_A = \{y \in U : a(x) = a(y), \forall a \in A\}, \text{ where the central object } x \in U \tag{6}$$

$$g(u,r) = \{v \in U : \frac{card\{IND(u,v)\}}{card\{A\}|} \geqslant r\} \tag{7}$$

$$\text{where, } IND(u,v) = \{a \in A : a(u) = a(v)\} \tag{8}$$

$$T : [0,1] \times [0,1] \to [0,1], \tag{9}$$

$$x \Rightarrow_T y \geqslant r \text{ if and only if } T(x,r) \leqslant y \tag{10}$$

$$x \Rightarrow_T y = max\{r : T(x,r) \leqslant y\} \tag{11}$$

$$\mu_T(x,y,r) \text{ if and only if } x \Rightarrow_T y \geqslant r \tag{12}$$

$$dis_\varepsilon(u,v) = \frac{|\{a \in A : ||a(u) - a(v)|| \geqslant \varepsilon\}|}{|A|} \tag{13}$$

$$ind_\varepsilon(u,v) = \frac{|\{a \in A : ||a(u) - a(v)|| < \varepsilon\}|}{|A|} \tag{14}$$

$$Param(v_d) = \sum_{\{v \in U_{trn} : d(v) = v_d\}} w(v,u,\varepsilon) \tag{15}$$

$$Param(v_d) = \sum_{\{v_p \in U_{trn} : d(v_p) = v_d\}} w(u_q, v_p), \tag{16}$$

$$S^{c_i}(a) = \frac{(\overline{C}_i^a - \hat{C}_i^a)^2}{Z_{\overline{C}_i^{a2}} + Z_{\hat{C}_i^{a2}}}, a \in A. \tag{17}$$

$$C_i^a = \{a(u) : u \in U \ and \ d(u) = c_i\}. \tag{18}$$

$$F_{c_i}(a) = \frac{MSTR_{c_i}(a)}{MSE_{c_i}(a)} \tag{19}$$

$$C_i^a = \{a(u) : u \in U \ and \ d(u) = c_i\} \tag{20}$$

$$MSTR_{c_i}(a) = card\{C_i^a\} * (\bar{C}_i^a - \hat{C}_i^a)^2 \tag{21}$$

$$A_{c_i}(a) = C_i^a \wedge_\varepsilon \{U \backslash C_i^a\} \tag{22}$$

$$\frac{card\{a(u) \in C_i^a : \frac{|a(u) - \hat{C}_i^a|}{train_a} > \varepsilon\}}{card\{C_i^a\}} \tag{23}$$

$$Balanced.acc = \frac{acc_{c_1} + acc_{c_2} + ... + acc_{c_k}}{k} \tag{24}$$

$$Param(v_d) = \sum_{\{v \in U_{trn} : d(v) = v_d\}} w(v, u, \varepsilon) \tag{25}$$

$$\frac{card\{a(u) \in C_i^a : \frac{|a(u) - \hat{C}_i^a|}{train_a} > \varepsilon\}}{card\{C_i^a\}} \tag{26}$$

$$MSE_{c_i}(a) = \frac{\sum_{j=1}^{card\{C_i^a\}} (a(u_j) - \bar{C}_i^a)^2}{card\{C_i^a\}}, \text{ where } u_j \in C_i^a, i = 1, 2, ..., card\{C_i^a\} \tag{27}$$

$$C_i^a = \{a(u) : u \in U \ and \ d(u) = c_i\}, \hat{C}_i^a = \frac{\{a(v) : v \in U \ and \ d(v) \neq c_i\}}{card\{U\} - card\{C_i^a\}}. \tag{28}$$

$$C_i^a \wedge_\varepsilon \{U \backslash C_i^a\} = \frac{card\{a(u) \in C_i^a : \exists a(v) \in \{U \backslash C_i^a\}; \frac{|a(u) - a(v)|}{train_a} \leqslant \varepsilon\} + card\{a(v) \in \{U \backslash C_i^a\} : \exists a(u) \in C_i^a; \frac{|a(u) - a(v)|}{train_a} \leqslant \varepsilon\}}{card\{U\}} \tag{29}$$

$$c_{ij} = \begin{cases} 1, \text{ if } \frac{card\{IND(u_i, u_j)\}}{card\{A\}} \geqslant r_{gran} \\ 0, \text{ otherwise} \end{cases} \tag{30}$$

$$C_i^a \wedge_\varepsilon C_j^a = \frac{card\{a(u) \in C_i^a : \exists a(v) \in C_j^a; \frac{|a(u) - a(v)|}{train_{C_i^a, C_j^a}} \leqslant \varepsilon\} + card\{a(v) \in C_j^a; \frac{|a(v) - a(u)|}{train_{C_i^a, C_j^a}} \leqslant \varepsilon\}}{card\{C_i^a\}} \tag{31}$$

$$\frac{card\{a(u) \in C_i^a : \frac{|a(u) - \overline{C}_j^a|}{train_{C_i^a, C_j^a}} \leqslant \varepsilon\} + card\{a(v) \in C_j^a : \frac{|a(v) - \overline{C}_i^a|}{train_{C_i^a, C_j^a}} \leqslant \varepsilon\}}{card\{C_i^a\} + card\{C_j^a\}} \tag{32}$$

$$C_i^a = \{a(u) : u \in U \ and \ d(u) = c_i\}, \hat{C}_i^a = \frac{\{a(v) : v \in U \ and \ d(v) \neq c_i\}}{card\{U\} - card\{C_i^a\}}. \tag{33}$$

$$C_i^a \wedge_\varepsilon \{U \backslash C_i^a\} = \frac{card\{a(u) \in C_i^a : \exists a(v) \in \{U \backslash C_i^a\}; \frac{|a(u) - a(v)|}{train_a} \leqslant \varepsilon\} + card\{a(v) \in \{U \backslash C_i^a\} : \exists a(u) \in C_i^a; \frac{|a(u) - a(v)|}{train_a} \leqslant \varepsilon\}}{card\{U\}} \tag{34}$$

$$\overline{C}_i^a = \frac{\{\sum a(u) : u \in U \ and \ d(u) = c_i\}}{card\{C_i^a\}}, \hat{C}_i^a = \frac{\{\sum a(v) : v \in U \ and \ d(v) \neq c_i\}}{card\{U\} - card\{C_i^a\}}. \tag{35}$$

$$Z_{\overline{C}_i^{a2}} = \frac{\sum_{a(u)\in C_i^a}(a(u) - \overline{C}_i^a)^2}{card\{C_i^a\}}, Z_{\hat{C}_i^{a2}} = \frac{\sum_{a(v)\in U\setminus C_i^a}(a(v) - \hat{C}_i^a)^2}{card\{U\} - card\{C_i^a\}} \tag{36}$$

$$w(u_q, v_p) = w(u_q, v_p) + \frac{|a(u_q) - a(v_p)|}{(max\_attr_a - min\_attr_a) * (\varepsilon + \frac{|a(u_q)-a(v_p)|}{max\_attr_a - min\_attr_a})} \text{ i. e.,} \tag{37}$$

$$w(u_q, v_p) = w(u_q, v_p) + \frac{|a(u_q) - a(v_p)|}{(max\_attr_a - min\_attr_a) * \varepsilon + |a(u_q) - a(v_p)|} \tag{38}$$

$$w(u_q, v_p) = w(u_q, v_p) + \frac{|a(u_q) - a(v_p)|}{(max\_attr_a - min\_attr_a) * \varepsilon} \tag{39}$$

$$c'_{ij} = \begin{cases} c_{ij} \text{ gdy } d(x_i) \neq d(x_j) \\ \phi \text{ gdy } d(x_i) = d(x_j). \end{cases} \tag{40}$$

Procedure
Input data
$A' \leftarrow \emptyset$
$iter \leftarrow 0$
for i=1,2,...,card{A} **do**
  for j=1,2,...,k **do**
    $F^{c_j}(a) = F_i^{c_j}(a)$
    if $a \notin A'$ **then**
      $A' \leftarrow a$
      $iter \leftarrow iter + 1$
      if $iter = fixed\ number\ of\ the\ best\ genes$ **then**
        BREAK
      end if
    end if
  end for
  if $iter = fixed\ number\ of\ the\ best\ genes$ **then**
    BREAK
  end if
end for
return A'

$$S_1^{c_1}(a) > S_2^{c_1}(a) > ... > S_{card\{A\}}^{c_1}(a)$$

$$S_1^{c_2}(a) > S_2^{c_2}(a) > ... > S_{card\{A\}}^{c_2}(a)$$

$$\vdots$$

$$S_1^{c_k}(a) > S_2^{c_k}(a) > ... > S_{card\{A\}}^{c_k}(a)$$