

## ProGen/max input format: MRCPSP/max

|          |        |             |             |     |             |                      |     |                          |
|----------|--------|-------------|-------------|-----|-------------|----------------------|-----|--------------------------|
| $n$      | $\rho$ | $\nu$       | $\delta$    |     |             |                      |     |                          |
| 0        | 1      | $s_0$       | $j_1^0$     | ... | $j_{s_0}^0$ | $[\delta_{0,j_1^0}]$ | ... | $[\delta_{0,j_{s_0}^0}]$ |
| 1        | $m_1$  | $s_1$       | $j_1^1$     | ... | $j_{s_1}^1$ | $[\delta_{1,j_1^1}]$ | ... | $[\delta_{1,j_{s_1}^1}]$ |
| ...      |        |             |             |     |             |                      |     |                          |
| $n$      | $m_n$  | $s_n$       | $j_1^n$     | ... | $j_{s_n}^n$ | $[\delta_{n,j_1^n}]$ | ... | $[\delta_{n,j_{s_n}^n}]$ |
| $n+1$    | 1      | 0           |             |     |             |                      |     |                          |
| 0        | 1      | 0           | $r_0^1$     |     |             |                      |     |                          |
| 1        | 1      | $p_1^1$     | $r_1^1$     |     |             |                      |     |                          |
|          | 2      | $p_1^2$     | $r_1^2$     |     |             |                      |     |                          |
| ...      |        |             |             |     |             |                      |     |                          |
|          | $m_n$  | $p_n^{m_n}$ | $r_n^{m_n}$ |     |             |                      |     |                          |
| $n+1$    | 1      | 0           | $r_{n+1}^1$ |     |             |                      |     |                          |
| <b>R</b> |        |             |             |     |             |                      |     |                          |

where

- $\delta_{i,j_s^i} \equiv \delta_{i,j_s^i}^{1,1}, \delta_{i,j_s^i}^{1,2}, \dots, \delta_{i,j_s^i}^{m_i, m_{j_s^i} - 1}, \delta_{i,j_s^i}^{m_i, m_{j_s^i}}$
- $r_i^m \equiv {}^\rho r_{i,1}^m, \dots, {}^\rho r_{i,\rho}^m, {}^\nu r_{i,\rho+1}^m, \dots, {}^\nu r_{i,\rho+\nu}^m, {}^\rho r_{i,\rho+\nu+1}^m, \dots, {}^\rho r_{i,\rho+\nu+\delta}^m, {}^\nu r_{i,\rho+\nu+1}^m, \dots, {}^\nu r_{i,\rho+\nu+\delta}^m$
- $R \equiv {}^\rho R_1, \dots, {}^\rho R_\rho, {}^\nu R_{\rho+1}, \dots, {}^\nu R_{\rho+\nu}, {}^\rho R_{\rho+\nu+1}, \dots, {}^\rho R_{\rho+\nu+\delta}, {}^\nu R_{\rho+\nu+1}, \dots, {}^\nu R_{\rho+\nu+\delta}$

## Symbols

| Symbol                    | Denotes  |
|---------------------------|--|
| $n$                       | Number of real activities  |
| $\rho$                    | Number of renewable resources  |
| $\nu$                     | Number of nonrenewable resources   |
| $\delta$                  | Number of doubly-constrained resources   |
| $m_i$                     | Number of modes for activity $i$   |
| $s_i$                     | Number of direct successors of node $i$ in project network                                       |
| $j_s^i$                   | $s$ -th successor of node $i$ in project network   |
| $\delta_{i,j_s^i}^{m,m'}$ | Weight of arc $(i, j_s^i)$ if $i$ is performed in mode $m$ and $j_s^i$ is performed in mode $m'$ |
| $p_i^m$                   | Duration of activity $i$ if performed in mode $m$  |
| ${}^\rho r_{ik}^m$        | Number of units of resource $k$ used for executing activity $i$ in mode $m$                      |
| ${}^\nu r_{ik}^m$         | Number of units of resource $k$ consumed for executing activity $i$ in mode $m$                  |
| ${}^\rho R_k$             | Renewable capacity of resource $k$   |
| ${}^\nu R_k$              | Nonrenewable availability of resource $k$  |