Datasets Explanation

1. General Information:
In this document, there are explanations regarding the datasets of the scheduling problem of unrelated parallel batch machines.

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3. References:

The datasets in this study were generated using the methods in the studies by Baker ve Bertrand (1981), Arroyo ve Leung (2017a, 2017b) ve Arroyo et al. (2019).

[Arroyo, J. E. C., Leung, J. Y. T., & Tavares, R. G. (2019). An iterated greedy algorithm for total flow time minimization in unrelated parallel batch machines with unequal job release times. Engineering Applications of Artificial Intelligence, 77, 239-254. https://doi.org/10.1016/j.engappai.2018.10.012]

[Arroyo, J. E. C., & Leung, J. Y. T. (2017a). An effective iterated greedy algorithm for scheduling unrelated parallel batch machines with non-identical capacities and unequal ready times. Computers & Industrial Engineering, 105, 84-100. http://dx.doi.org/10.1016/j.cie.2016.12.038]

[Arroyo, J. E. C., & Leung, J. Y. T. (2017b). Scheduling unrelated parallel batch processing machines with non-identical job sizes and unequal ready times. Computers & Operations Research, 78, 117-128. http://dx.doi.org/10.1016/j.cor.2016.08.015]

4. Studies Using the Datasets:
The datasets generated in this study were used in the studies given below.

[Bakir M., Sebatlı-Saglam, A., Cavdur F., "Bağlantısız Paralel Parti Üretimi Yapan Makine Çizelgeleme Probleminin Karışık-Tamsayılı Programlama ile Çözümü", Politeknik Dergisi. (evaluation phase)

5. Datasets Content:

In the datasets generated, there are different data for 10 jobs (n) and 2 machines (m). The datasets include, (i) machine capacities (Q_k), (ii) processing times of jobs (p_jk), (iii) sizes of jobs (s_j), (iv) release times of jobs (r_j), and (v) due dates of jobs (d_j) for different α value.

i. Each machine has a certain capacity and no work can exceed the machine capacity. Q_k values presented in the form of row vectors in datasets.
ii. The processing time of the jobs refers to the processing times of each job on each machine. It is presented in p_jk values sparse structure within the datasets.
iii. In the study, jobs with dimensions that are not the same are scheduled. s_j values presented as a line vector in datasets.
iv. The time for a job to be ready is the earliest it can begin to be processed. Jobs to be scheduled have non-zero readiness times. r_j values presented as a line vector in datasets.
v. Each job has a deadline. In order to minimize delays, work must be completed as soon as possible before deadlines. It is presented as d_j values line vector in datasets.