**Data of the problem instances**

**Table 1.** The input data for Problem Instance 1

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 5 | 0 | 23 | 24 | 25 | 22 | 34 |  |  |  |  |  |
| **2** | 5 | 24 | 24 | 24 | 36 | 37 | 25 |  |  |  |  |  |
| **3** | 5 | 35 | 50 | 45 | 44 | 37 | 27 |  |  |  |  |  |
| **4** | 5 | 22 | 43 | 33 | 23 | 53 | 36 |  |  |  |  |  |
| **5** | 5 | 57 | 25 | 34 | 35 | 23 | 44 |  |  |  |  |  |

**Table 2.** The input data for Problem Instance 2

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 5 | 0 | 19 | 26 | 35 | 44 | 50 |  |  |  |  |  |
| **2** | 6 | 25 | 28 | 39 | 44 | 33 | 50 | 46 |  |  |  |  |
| **3** | 5 | 46 | 39 | 42 | 38 | 29 | 25 |  |  |  |  |  |
| **4** | 6 | 50 | 50 | 44 | 17 | 37 | 21 | 29 |  |  |  |  |
| **5** | 7 | 18 | 40 | 22 | 15 | 26 | 35 | 39 | 44 |  |  |  |

**Table 3**. The input data for Problem Instance 3

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 10 | 0 | 23 | 24 | 25 | 22 | 34 | 31 | 29 | 40 | 35 | 50 |
| **2** | 10 | 24 | 24 | 24 | 36 | 37 | 25 | 28 | 32 | 25 | 27 | 38 |
| **3** | 10 | 35 | 50 | 45 | 44 | 37 | 27 | 25 | 28 | 25 | 27 | 26 |
| **4** | 10 | 22 | 43 | 33 | 23 | 53 | 36 | 24 | 27 | 29 | 31 | 32 |
| **5** | 10 | 57 | 25 | 34 | 35 | 23 | 44 | 34 | 26 | 28 | 42 | 32 |
| **6** | 10 | 26 | 24 | 27 | 28 | 35 | 26 | 40 | 51 | 53 | 52 | 25 |
| **7** | 10 | 70 | 26 | 27 | 27 | 29 | 32 | 34 | 33 | 38 | 42 | 41 |
| **8** | 10 | 3 | 25 | 36 | 28 | 22 | 19 | 36 | 24 | 32 | 21 | 17 |
| **9** | 10 | 0 | 52 | 42 | 57 | 24 | 28 | 31 | 32 | 48 | 52 | 19 |
| **10** | 10 | 17 | 55 | 36 | 37 | 28 | 53 | 26 | 25 | 28 | 31 | 32 |

**Table 4.** The input data for Problem Instance 4

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 8 | 8 | 40 | 35 | 28 | 36 | 29 | 15 | 24 | 33 |  |  |
| **2** | 7 | 15 | 50 | 28 | 24 | 19 | 20 | 14 | 21 |  |  |  |
| **3** | 6 | 22 | 44 | 33 | 22 | 17 | 43 | 39 |  |  |  |  |
| **4** | 5 | 44 | 38 | 37 | 18 | 22 | 33 |  |  |  |  |  |
| **5** | 8 | 3 | 41 | 38 | 27 | 25 | 19 | 16 | 47 | 9 |  |  |
| **6** | 5 | 0 | 50 | 43 | 36 | 29 | 15 |  |  |  |  |  |

**Table 5.** The input data for Problem Instance 5

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 6 | 5 | 5 | 26 | 10 | 18 | 6 | 19 |  |  |  |  |
| **2** | 7 | 6 | 8 | 17 | 21 | 9 | 32 | 33 | 22 |  |  |  |
| **3** | 10 | 20 | 23 | 26 | 32 | 37 | 15 | 20 | 22 | 18 | 23 | 30 |
| **4** | 8 | 15 | 20 | 21 | 44 | 33 | 27 | 33 | 41 | 14 |  |  |
| **5** | 5 | 36 | 33 | 6 | 22 | 21 | 20 |  |  |  |  |  |
| **6** | 9 | 44 | 19 | 17 | 9 | 25 | 40 | 17 | 27 | 33 | 42 |  |
| **7** | 10 | 0 | 5 | 7 | 18 | 22 | 33 | 41 | 12 | 38 | 21 | 19 |

**Table 6.** The input data for Problem Instance 6

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 5 | 25 | 16 | 25 | 47 | 14 | 5 |  |  |  |  |  |
| **2** | 7 | 22 | 12 | 26 | 39 | 36 | 24 | 45 | 29 |  |  |  |
| **3** | 8 | 26 | 10 | 22 | 7 | 29 | 27 | 20 | 50 | 50 |  |  |
| **4** | 9 | 8 | 46 | 49 | 41 | 24 | 33 | 39 | 29 | 21 | 9 |  |
| **5** | 8 | 31 | 48 | 8 | 15 | 10 | 39 | 29 | 21 | 9 |  |  |
| **6** | 7 | 35 | 7 | 10 | 49 | 44 | 32 | 35 | 11 |  |  |  |
| **7** | 10 | 43 | 14 | 47 | 11 | 3 | 34 | 40 | 20 | 28 | 37 | 32 |

**Table 7.** The input data for Problem Instance 7

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 10 | 0 | 35 | 25 | 33 | 46 | 18 | 21 | 39 | 40 | 18 | 21 |
| **2** | 9 | 20 | 24 | 32 | 18 | 15 | 40 | 27 | 14 | 12 | 20 |  |
| **3** | 8 | 18 | 35 | 27 | 29 | 46 | 33 | 15 | 21 | 20 |  |  |
| **4** | 7 | 35 | 11 | 25 | 39 | 21 | 17 | 50 | 48 |  |  |  |
| **5** | 6 | 5 | 21 | 32 | 19 | 35 | 42 | 48 |  |  |  |  |
| **6** | 5 | 40 | 27 | 13 | 36 | 41 | 37 |  |  |  |  |  |
| **7** | 8 | 27 | 13 | 23 | 35 | 27 | 41 | 32 | 22 | 45 |  |  |
| **8** | 7 | 3 | 22 | 34 | 17 | 26 | 43 | 32 | 16 |  |  |  |
| **9** | 5 | 10 | 50 | 48 | 27 | 36 | 11 |  |  |  |  |  |

**Table 8.** The input data for Problem Instance 8

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 10 | 0 | 23 | 24 | 25 | 22 | 34 | 31 | 29 | 40 | 35 | 50 |
| **2** | 10 | 24 | 24 | 24 | 36 | 37 | 25 | 28 | 32 | 25 | 27 | 38 |
| **3** | 10 | 35 | 50 | 45 | 44 | 37 | 27 | 25 | 28 | 25 | 27 | 26 |
| **4** | 10 | 22 | 43 | 33 | 23 | 53 | 36 | 24 | 27 | 29 | 31 | 32 |
| **5** | 10 | 57 | 25 | 34 | 35 | 23 | 44 | 34 | 26 | 28 | 42 | 32 |

**Table 9.** The input data for Problem Instance 9

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Vessel****no** |  | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** |  | 5 | 2 | 46 | 30 | 40 | 48 | 30 |  |  |  |  |  |
| **2** |  | 7 | 37 | 20 | 5 | 50 | 5 | 34 | 17 | 8 |  |  |  |
| **3** |  | 8 | 24 | 6 | 24 | 20 | 17 | 10 | 29 | 19 | 43 |  |  |
| **4** |  | 9 | 43 | 21 | 41 | 30 | 11 | 9 | 43 | 25 | 11 | 40 |  |
| **5** |  | 10 | 18 | 44 | 34 | 17 | 25 | 11 | 40 | 13 | 41 | 21 | 17 |
| **6** |  | 10 | 2 | 18 | 19 | 36 | 29 | 32 | 14 | 47 | 28 | 27 | 49 |
| **7** |  | 10 | 46 | 33 | 41 | 20 | 11 | 8 | 42 | 49 | 9 | 17 | 39 |
| **8** |  | 10 | 9 | 36 | 45 | 28 | 35 | 15 | 24 | 30 | 23 | 43 | 43 |
| **9** |  | 10 | 20 | 48 | 35 | 47 | 36 | 6 | 42 | 46 | 14 | 47 | 9 |
| **10** |  | 8 | 46 | 40 | 24 | 14 | 40 | 12 | 50 | 42 | 38 |  |  |

**Table 10.** The input data for Problem Instance 10

|  |  |  |  |
| --- | --- | --- | --- |
| **Vessel****no** | **Vessel****length** | **Arrival****time** | **The handling times of each Ship-Bay in each vessel** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **1** | 5 | 0 | 23 | 24 | 25 | 22 | 34 |  |  |  |  |  |
| **2** | 5 | 24 | 24 | 24 | 36 | 37 | 25 |  |  |  |  |  |
| **3** | 5 | 35 | 50 | 45 | 44 | 37 | 27 |  |  |  |  |  |
| **4** | 5 | 22 | 43 | 33 | 23 | 53 | 36 |  |  |  |  |  |
| **5** | 5 | 57 | 25 | 34 | 35 | 23 | 44 |  |  |  |  |  |
| **6** | 5 | 26 | 24 | 27 | 28 | 35 | 26 |  |  |  |  |  |
| **7** | 5 | 70 | 26 | 27 | 27 | 29 | 32 |  |  |  |  |  |
| **8** | 5 | 3 | 25 | 36 | 28 | 22 | 19 |  |  |  |  |  |
| **9** | 5 | 0 | 52 | 42 | 57 | 24 | 28 |  |  |  |  |  |
| **10** | 5 | 17 | 55 | 36 | 37 | 28 | 53 |  |  |  |  |  |