Indices:

|  |  |
| --- | --- |
|  | indices of strip types, where J is the number of all strip types |
|  | indices of item types, where N is the number of all item types |
|  | indices of stock cutting patterns, where *K* is the number of all patterns |
|  | indices of strip cutting patterns, where *P* is the number of all patterns |

Parameters:

|  |  |
| --- | --- |
|  | strip cutting patterns |
|  | stock cutting patterns |
|  | = −1 if strip cutting pattern *p* is linked to strip type *j* |
|  |  |
|  | demand of item type *i* |
|  |  |
|  | dual value of constraint (2) |
|  | dual value of constraint (3) |
|  |  |
|  | width of strip type *j* |
|  | length of strip type *j* |
|  | width of item type *i* |
|  | length of item type *i* |
| *W* | width of stock |
| *L* | length of stock |

Variables:

|  |  |
| --- | --- |
|  | number of times that stock cutting pattern *k* is performed |
|  | number of times that strip cutting pattern *p* is performed |
|  | number of times that strip type *j* appears in a newly generated stock cutting pattern |
|  | number of times that item type *i* appears in a newly generated strip cutting pattern |

MP

|  |  |  |
| --- | --- | --- |
|  |  | () |
|  |  | () |
|  |  | () |
|  |  | () |
|  |  | () |

In order to find an optimal solution for the LP relaxation of master problem, we define a first stage pricing sub problem SP1 that associated to (2) in MP and search for a negative reduced cost first stage cutting pattern.

SP1:

|  |  |  |
| --- | --- | --- |
|  |  | () |
|  |  | () |
|  |  | () |

if the objective value of first stage pricing sub problem , then the resulting first stage cutting pattern with negative reduced cost is added. Otherwise, we define a second stage pricing sub problem SP2 that associated to (2) in MP and search for a negative reduced cost second stage cutting pattern.

SP2:

|  |  |  |
| --- | --- | --- |
|  |  | () |
|  |  | () |
|  |  | () |

if the objective value of second stage pricing sub problem , then the resulting second stage cutting pattern with negative reduced cost is added. If there is no reduced cost for the SP2, the optimal LP solution of the master problem is found.