**1.用单纯形法求解问题：**

解：

（1）化为标准形式

（2）初始化单纯形表

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基矢量 |  |  |  |  |  |
|  | -4 | -2 | 0 | 0 | 0 |
|  | 1 | 1 | 1 | 0 | 5 |
|  | **2** | 0.5 | 0 | 1 | 8 |
| 检验数 | -4 | -2 | 0 | 0 | 0 |

（3）第一次迭代

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基矢量 |  |  |  |  |  |
|  | -4 | -2 | 0 | 0 | 0 |
|  | 0 | **3/4** | 1 | -1/2 | 1 |
|  | 1 | 1/4 | 0 | 1/2 | 4 |
| 检验数 | 0 | -1 | 0 | 2 | 16 |

（4）第二次迭代

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基矢量 |  |  |  |  |  |
|  | -4 | -2 | 0 | 0 | 0 |
|  | 0 | 1 | 4/3 | -2/3 | 4/3 |
|  | 1 | 0 | -1/3 | 2/3 | 11/3 |
| 检验数 | 0 | 0 | 4/3 | 4/3 | 52/3 |

因为，所以最优解为，最优值为。

**2.用单纯形法求解问题**

解：

（1）化为标准形式

（2）初始化单纯形表

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |
|  | 1 | -3 | 0 | 0 | 0 |
|  | -1 | **2** | 1 | 0 | 6 |
|  | 1 | 1 | 0 | 1 | 5 |
| 判别数 | 1 | -3 | 0 | 0 | 0 |

（3）第一次迭代

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |
|  | 1 | -3 | 0 | 0 | 0 |
|  | -1/2 | 1 | 1/2 | 0 | 3 |
|  | **3/2** | 0 | -1/2 | 1 | 2 |
| 判别数 | -1/2 | 0 | 3/2 | 0 | 9 |

（4）第二次迭代

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |
|  | 1 | -3 | 0 | 0 | 0 |
|  | 0 | 1 | 1/3 | 1/3 | 11/3 |
|  | 1 | 0 | -1/3 | 2/3 | 4/3 |
| 判别数 | 0 | 0 | 4/3 | 1/3 | 29/3 |

结果为，最小值为

**3.用单纯形法求解问题**

解：

（1）初始化单纯形表

（2）初始化单纯形表

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -1 | -3 | -1 | 0 | 0 | 0 |
|  | 1 | 4 | 3 | 1 | 0 | 12 |
|  | -1 | **2** | -1 | 0 | 1 | 4 |
| 判别数 | -1 | -3 | -1 | 0 | 0 | 0 |

（3）第一次迭代

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -1 | -3 | -1 | 0 | 0 | 0 |
|  | **3** | 0 | 5 | 1 | -2 | 4 |
|  | -1/2 | 1 | -1/2 | 0 | 1/2 | 2 |
| 判别数 | -5/2 | 0 | -5/2 | 0 | 3/2 | 6 |

（4）第二次迭代

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -1 | -3 | -1 | 0 | 0 | 0 |
|  | 1 | 0 | 5/3 | 1/3 | -2/3 | 4/3 |
|  | 0 | 1 | 1/3 | 1/6 | **1/6** | 8/3 |
| 判别数 | 0 | 0 | 5/3 | 5/6 | -1/6 | 28/3 |

（5）第三次迭代

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -1 | -3 | -1 | 0 | 0 | 0 |
|  | 1 | 4 | 3 | 1 | 0 | 12 |
|  | 0 | 6 | 2 | 1 | 1 | 16 |
| 判别数 | 0 | 1 | 2 | 1 | 0 | 12 |

结果为

但因为目标函数值中不含有，所以最终结果为，最大值为12

**4.用单纯形法求解问题**

解：

（1）化为标准形式

（2）初始化单纯形表

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -2 | -1 | 1 | 0 | 0 | 0 |
|  | 1 | 1 | 2 | 1 | 0 | 6 |
|  | **1** | 4 | -1 | 0 | 1 | 4 |
| 判别数 | -2 | -1 | 1 | 0 | 0 | 0 |

（3）第一次迭代

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -2 | -1 | 1 | 0 | 0 | 0 |
|  | 0 | -3 | **3** | 1 | -1 | 2 |
|  | 1 | 4 | -1 | 0 | 1 | 4 |
| 判别数 | 0 | 7 | -1 | 0 | 2 | 8 |

（4）第二次迭代

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 基变量 |  |  |  |  |  |  |
|  | -2 | -1 | 1 |  |  |  |
|  | 0 | -1 | 1 | 1/3 | 1/3 | 2/3 |
|  | 1 | 3 | 0 | 1/3 | 2/3 | 14/3 |
| 判别数 | 0 | 6 | 0 | 1/3 | 5/3 | 26/3 |

结果为，最大值为