ISE362 HW#2

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1. (a) Solution:

Using the ***medium sum heuristic***:

x-coordinate:

|  |  |  |
| --- | --- | --- |
| X-coordinate | Weight | Cum. Weight |
| 0 | 4 | 4 |
| 1 | 2 | 6 |
| 3 | 6 | 12 |
| 4 | 2 | 14 |
| 5 | 6 | 20 |

y-coordinate:

|  |  |  |
| --- | --- | --- |
| Y-coordinate | Weight | Cum. Weight |
| 0 | 4 | 4 |
| 1 | 2 | 6 |
| 2 | 6 | 12 |
| 3 | 2 | 14 |
| 4 | 6 | 20 |

Half Weight = 20/2 = 10

A: Locate facility at (3,2).

(b)Using excel solver:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| facility | **1** | **2** | **3** | **4** | **5** |  |
| X | 0 | 1 | 3 | 4 | 5 |  |
| Y | 0 | 3 | 2 | 1 | 4 |  |
| X\* | **3** | **3** | **3** | **3** | **3** |  |
| Y\* | **1** | **1** | **1** | **1** | **1** |  |
| Distance | 4 | 4 | 1 | 1 | 5 |  |
| Weight | 4 | 2 | 6 | 2 | 6 | sum↓ |
| D\*W | 16 | 8 | 6 | 2 | 30 | 62 |

A: Locate facility at (3,1).

2.(a) Solution:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(X,Y) coord.** | 1 | 2 | 3 | 4 | 5 |
| possible sites | (0,0) | (10,5) | (0,10) | (10,0) | (20,5) |
| existing fac. | (5,5) | (10,10) | (0,5) | (20,0) |  |

Table 2.1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | k=1 | k=2 | k=3 | k=4 |
| i=1 | 5 | 0 | 5 | 0 |
| i=2 | 0 | 10 | 5 | 0 |
| i=3 | 10 | 0 | 0 | 10 |

Table 2.2



Using Excel Solver, we obtain:





Min weighted Distance = 331.066

(b) Solution:

Adding constraints, we obtain:





Min weighted Distance = 388.580

6-3 Solution:

Decision tree is in “ISE362\_HW#2\_DecisionTree\_BolunXu.xlsm” with attached files.

Q: Which supplier should Alphacap choose?

A: MultiChem, it costs less.

Q: What other information would you like to have to make this decision?

A: Price that we sell products in. With the price, we can calculate the profit, and that will give a better decision than only concerning about costs.