Student’s Name

Professor Name

Course Code

Date

**Network diagram**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Client** | | | |
| **Consultant** | A | B | C | D |
| Alfred | 100 | 125 | 115 | 100 |
| Barbara | 110 | 135 | 115 | 110 |
| Charlie | 155 | 140 | 140 | 130 |

**1) Develop a network representation of the problem. You may reference the Network Diagram Template.**

100

125

115

110 100 135

110 115

155 140

140

130

2. Formulate the problem as a linear program; with the optimal solution providing the hours each consultant should be scheduled for each client to maximize the consulting firm’s billings. What is the schedule and what is the total billing.

**Linear Program**

Max. 100\*HAA+ 125\*HAB + 115\*HAC+ 100\*HAD+ 120\*HBA+ 135\*HBB+ 115\*HBC+ 120\*HBD+ 155\* HCA+ 150\*HCB+ 140\*HCC+ 130\*HCD

**Constraints**;

HAA+ HAB+ HAC+ HAD≤ 160 HBA+ HBB+ HBC+ HBD≤ 160 HCA+ HCB+ HCC+ HCD≤ 140 HAA+ HBA+ HCA≤ 180 HAB+HBB+ HCB≤75HAC+ HBC+ HCC≤ 100 HAD+ HBD+ HCD≤ 85; HAA≥ 0; HAB≥ 0; HAC≥ 0; HAD≥ 0; HBA≥ 0; HBB≥ 0; HBC≥ 0; HBD≥ 0; HCA≥ 0; HCB≥ 0; HCC≥ 0; HCD≥ 0;

**LINGO CODE:**

MAX= (100 \*HAA) + (125 \*HAB) + (115 \*HAC) + (100 \*HAD) + (120 \*HBA) + (135 \*HBB) + (115 \*HBC) + (120 \*HBD) + (155\* HCA) + (150 \*HCB) + (140 \*HCC) + (130 \*HCD);HAA +HAB+ HAC + HAD <= + 160; HBA + HBB + HBC + HBD <= 160; HCA + HCB + HCC + HCD <= 140; HAA + HBA + HCA <= 180; HAB HBB + HCB <=75;HAC + HBC + HCC <= 100; HAD + HBD + HCD <= 85; HAA >=0; HAB >=0; HAC >=0; HAD >=0; HBA >=0; HBB >=0; HBC >=0; HBD >=0; HCA >=0; HCB >=0; HCC >=0; HCD >=0 (Anderson, Sweeney and Williams 1`);

**Schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Client** | | | |
| **Consultant** | A | B | C | D |
| Alfred | - | 40 | 100 | - |
| Barbara | 40 | 35 | - | 85 |
| Charlie | 140 | - | - | - |

**Billing**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Client** | | | |
| **Consultant** | A | B | C | D |
| Alfred | - | 200 | 500 | - |
| Barbara | 250 | 350 | - | 450 |
| Charlie | 450 | - | - | - |

# Works Cited

Anderson, David R., et al. An Introduction to Management Science: Quantitative Approaches to Decision ... New York: Cengage learning, 2017.