**Data Analysis** - Sample Date for a **40 Node Network - Single Source to Single Destination**

**Hopfield Neural Networks Convergent Algorithms**

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|  | Ali & Kamoun Algorithm Path Traversed | |
| Source/Destination | **Path Taken** | **Cost(α)** |
| Node 1 to 3 | 1-> 2-> 3-> | 61 |
| Node 1 to 5 | 1-> 2-> 3-> 4-> 5-> | 85 |
| Node 1 to 6 | 1-> 2-> 8-> 7-> 6-> | 82 |
| Node 1 to 9 | 1-> 10-> 9-> | 23 |
| Node 1 to 12 | 1-> 10-> 11-> 12-> | 65 |
| Node 1 to 15 | No Convergence | - |
| Node 1 to 18 | 1-> 10-> 11-> 12-> 13-> 18-> | 136 |
| Node 1 to 20 | 1-> 10-> 11-> 20-> | 57 |

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| Park & Choi Algorithm Path Traversed | | |
| Source/Destination | **Path Taken** | **Cost(β)** |
| Node 1 to 3 | 1-> 2-> 3-> | 61 |
| Node 1 to 5 | 1-> 2-> 3-> 4-> 5-> | 85 |
| Node 1 to 6 | 1-> 2-> 3-> 4-> 5-> 6-> | 116 |
| Node 1 to 9 | 1-> 10-> 9-> | 23 |
| Node 1 to 12 | 1-> 10-> 11-> 12-> | 65 |
| Node 1 to 15 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> | 145 |
| Node 1 to 18 | 1-> 10-> 11-> 12-> 13-> 18-> | 136 |
| Node 1 to 20 | 1-> 10-> 11-> 20-> | 57 |

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| Ahn & Ramakrishna Algorithm Path Traversed | | |
| Source/Destination | **Path Taken** | **Cost(ρ)** |
| Node 1 to 3 | 1-> 2-> 3-> | 61 |
| Node 1 to 5 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> 6-> 5-> | 227 |
| Node 1 to 6 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> 6-> | 187 |
| Node 1 to 9 | 1-> 10-> 9-> | 23 |
| Node 1 to 12 | 1-> 10-> 11-> 12-> | 65 |
| Node 1 to 15 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> | 145 |
| Node 1 to 18 | 1-> 10-> 11-> 12-> 13-> 18-> | 136 |
| Node 1 to 20 | 1-> 10-> 11-> 20-> | 57 |

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| Park & Keum Algorithm Path Traversed | | | | |
| Source/Destination | **Path Taken** | **Cost(φ)** | |
| Node 1 to 3 | 1-> 2-> 3-> | | 61 | |
| Node 1 to 5 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> 6-> 5-> | | 227 | |
| Node 1 to 6 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> 6-> | | 187 | |
| Node 1 to 9 | 1-> 10-> 9-> | | 23 | |
| Node 1 to 12 | 1-> 10-> 11-> 12-> | | 65 | |
| Node 1 to 15 | 1-> 10-> 11-> 12-> 13-> 14-> 15-> | | 145 | |
| Node 1 to 18 | 1-> 10-> 11-> 12-> 13-> 18-> | | 136 | |
| Node 1 to 20 | 1-> 10-> 11-> 20-> | | 57 | |

**Non-Neural Convergent Algorithms**

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| Dijkstra Path Traversed | | |
| Source/Destination | **Path Taken** | **Cost(σ)** |
| Node 1 to 3 | 1-> 2-> 3-> | 61 |
| Node 1 to 5 | 1-> 2-> 8-> 7-> 4-> 5-> | 85 |
| Node 1 to 6 | 1-> 2-> 8-> 7-> 6-> | 82 |
| Node 1 to 9 | 1-> 10-> 9-> | 23 |
| Node 1 to 12 | 1-> 10-> 11-> 12-> | 65 |
| Node 1 to 15 | 1-> 2-> 8-> 7-> 14-> 15-> | 103 |
| Node 1 to 18 | 1-> 10-> 11-> 12-> 19-> 18-> | 111 |
| Node 1 to 20 | 1-> 10-> 11-> 20-> | 57 |

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| Bellman Ford Path Traversed | | |
| Source/Destination | **Path Taken** | **Cost(ω)** |
| Node 1 to 3 |  | 61 |
| Node 1 to 5 |  | 85 |
| Node 1 to 6 |  | 187 |
| Node 1 to 9 |  | 23 |
| Node 1 to 12 |  | 96 |
| Node 1 to 15 |  | 151 |
| Node 1 to 18 |  | 136 |
| Node 1 to 20 |  | 64 |

|  |  |
| --- | --- |
| Floyd Warshall Path Traversed | |
| Source/Destination | **Cost(τ)** |
| Node 1 to 3 | 61 |
| Node 1 to 5 | 85 |
| Node 1 to 6 | 82 |
| Node 1 to 9 | 23 |
| Node 1 to 12 | 65 |
| Node 1 to 15 | 103 |
| Node 1 to 18 | 111 |
| Node 1 to 20 | 57 |

**Total Results for 40 Node Network - Single Source to Single Destination**

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| Source/Destination | Cost(α) | Cost(β) | Cost(ρ) | Cost(φ) | Cost(σ) | Cost(ω) | Cost(τ) |
| Node 1 to 3 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Node 1 to 5 | 85 | 85 | 227 | 227 | 85 | 85 | 85 |
| Node 1 to 6 | 82 | 116 | 187 | 187 | 82 | 187 | 82 |
| Node 1 to 9 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| Node 1 to 12 | 65 | 65 | 65 | 65 | 65 | 96 | 65 |
| Node 1 to 15 | - | 145 | 145 | 145 | 103 | 151 | 103 |
| Node 1 to 18 | 136 | 136 | 136 | 136 | 111 | 136 | 111 |
| Node 1 to 20 | 57 | 57 | 57 | 57 | 57 | 64 | 57 |