Haorui Zhang

11-13-2021

CS 455

HW5

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Step | N’ | D(t), p(t) | D(u), p(u) | D(w),p(w) | D(x), p(x) | D(y), p(y) | D(z), p(z) |
| 1 | v | 4,v | 3,v | 4,v | 3, v | 8, v |  |
| 2 | vx | 4,v | 3,v | 4,v | 3,v | 8,v | 11,x |
| 3 | vxu | 4,v | 3,v | 4,v | 3,v | 8,v | 11,x |
| 4 | vxut | 4,v | 3,v | 4,v | 3,v | 8,v | 11,x |
| 5 | vxutw | 4,v | 3,v | 4,v | 3,v | 8,v | 11,x |
| 6 | vxutwy | 4,v | 3,v | 4,v | 3,v | 8,v | 11,x |
| 7 | vxutwyz | 4,v | 3,v | 4,v | 4,v | 8,v | 11,x |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Step | N’ | D(t), p(t) | D(u), p(u) | D(w),p(w) | D(x),p(x) | D(y),p(y) | D(v),p(v) |
| 1 | z |  |  |  | 8,z | 12,z |  |
| 2 | zx |  |  | 14,x | 8,z | 12,z | 11,x |
| 3 | zxy | 19, y |  | 14,x | 8,z | 12,z | 11,x |
| 4 | zxyv | 15, v | 14, v | 14, x | 8,z | 12,z | 11,x |
| 5 | zxyvu | 15, v | 14, v | 14, x | 8,z | 12,z | 11,x |
| 6 | zxyvuw | 15, v | 14, v | 14,x | 8, z | 12, z | 11, x |
| 7 | zxyvuwt | 15, v | 14, v | 14, x | 8, z | 12, z | 11, x |

1. In the algorithm, the shortest distance to each node would be updated to all of its neighbor nodes in each iteration. For node A and B, which is A’s neighbor node, B’s neighbor would know the shortest path to A after one iteration. Assume the longest simple path between two nodes is d in the network. It means the longest path would be updated by the d-1th iteration, and all others path info would be updated by the max of d-1 th iteration. Therefore, the network would converge by the max of d-1 iterations.
   1. Node X

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X | 0 | 3 | 4 |
| Y |  |  |  |
| Z |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X | 0 | 3 | 4 |
| Y |  | 0 | 6 |
| Z |  |  |  |

* 1. Node Y

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X |  |  |  |
| Y | 3 | 0 | 6 |
| Z |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X |  |  |  |
| Y | 3 | 0 | 6 |
| Z |  |  |  |

* 1. Node Z

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X |  |  |  |
| Y |  |  |  |
| Z | 4 | 6 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X | 0 | 3 | 4 |
| Y |  |  |  |
| Z |  |  |  |

Final:

|  |  |  |  |
| --- | --- | --- | --- |
| From/Cost | X | Y | Z |
| X | 0 | 3 | 4 |
| Y |  |  |  |
| Z |  |  |  |

* 1. eBGP
  2. iBGP
  3. eBGP
  4. iBGP
  5. I1 since the shortest path from 1c to 1d is through I1.
  6. I2 since AS1 has same AS-path length to AS2 and AS3 but I2 has the closest hop distance.
  7. I1 since I1 has the path that has shortest AS-path length.