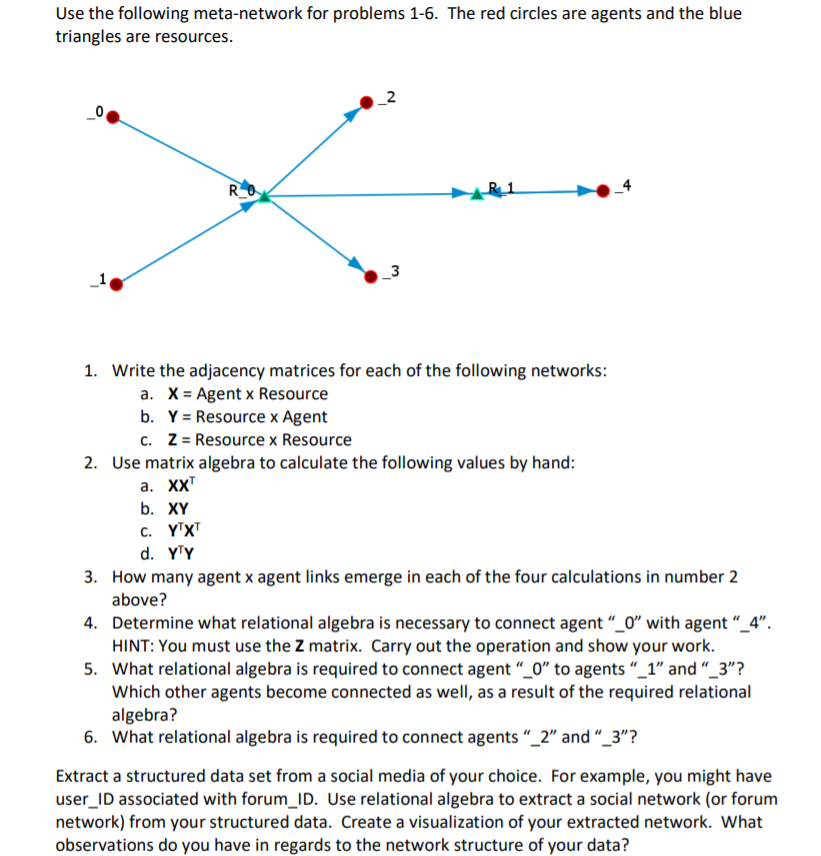
**ASSIGNMENT 5**

**Guan Yue Wang**

****

**1a**

X=

|  |  |  |
| --- | --- | --- |
|  | R\_0 | R\_1 |
| \_0 | 1 | 0 |
| \_1 | 1 | 0 |
| \_2 | 0 | 0 |
| \_3 | 0 | 0 |
| \_4 | 0 | 1 |

**1b**

Y=

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | \_0 | \_1 | \_2 | \_3 | \_4 |
| R\_0 | 0 | 0 | 1 | 1 | 0 |
| R\_1 | 0 | 0 | 0 | 0 | 1 |

**1c**

Z=

|  |  |  |
| --- | --- | --- |
|  | R\_0 | R\_1 |
| R\_0 | 0 | 1 |
| R\_1 | 0 | 0 |

**2a**

X

|  |  |
| --- | --- |
| 1 | 0 |
| 1 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 1 |

XT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 |

XXT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 |

**2b**

X

|  |  |
| --- | --- |
| 1 | 0 |
| 1 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 1 |

Y=

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |

XY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 |

**2c**

YT

|  |  |
| --- | --- |
| 0 | 0 |
| 0 | 0 |
| 1 | 0 |
| 1 | 0 |
| 0 | 1 |

XT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 |

YT XT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 |

**2d**

YT

|  |  |
| --- | --- |
| 0 | 0 |
| 0 | 0 |
| 1 | 0 |
| 1 | 0 |
| 0 | 1 |

Y=

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |

YT Y

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |

**3.**

Five links

**4.**

To connect agent\_0 to agent \_4, we need XZY as below

X

|  |  |
| --- | --- |
| 1 | 0 |
| 1 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 1 |

Z

|  |  |
| --- | --- |
| 0 | 1 |
| 0 | 0 |

Y

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 |

XZY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

**5.**

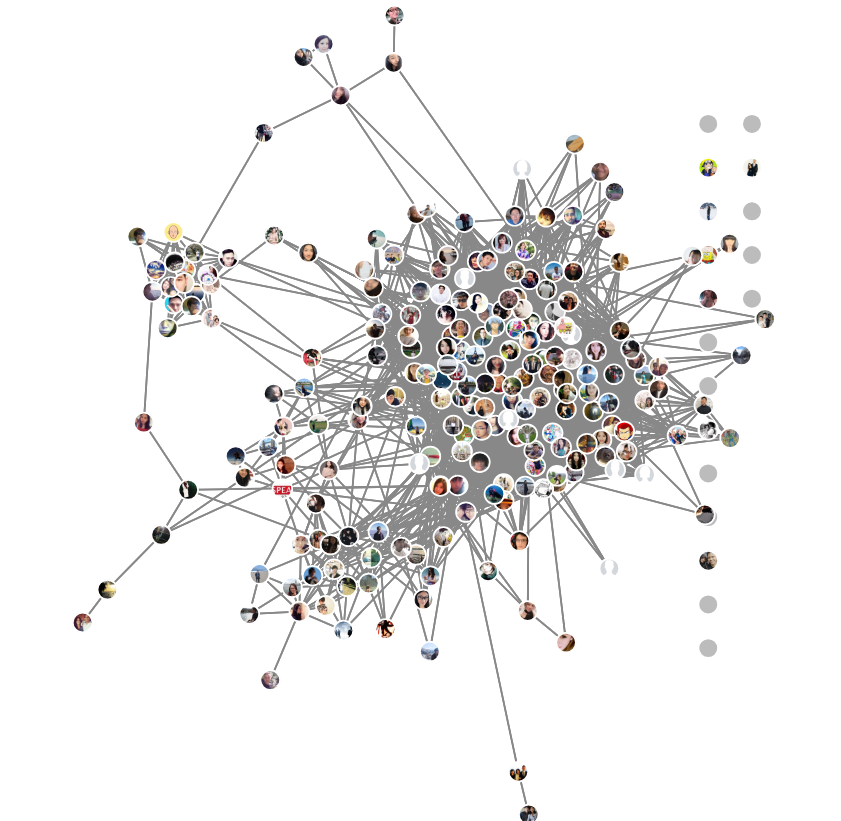
To connect agent\_0 to agent \_1, we need XXT, no other agent becomes connected.

To connect agent\_0 to agent \_3, we need XY, agent 2 also becomes connected as well

**6.**

To connect agent\_2 to agent\_3, we need YT Y

**Visualization of Facebook network**



Observation: Lattice Network with mostly high school and university friends all connected to each other.