Graph Pattern	Hop Type	Relational Algebra Expression
`(a)-[FriendOf]->(b),` `(b)-[Knows]->(c)`	One Hop And Branch	$\widetilde{\pi}_m\left(\rho^m_{f_{id}}(F) \bowtie \rho^m_{p_{id}}(K)\right)$
`(a)-[FriendOf]->(b)-[FriendOf]->(c),` `(b)-[Knows]->(d)`	Two Hops And Branch	$\widetilde{\pi}_m\left(\left(\rho^m_{f_{id}}(F) \bowtie \rho^m_{p_{id}}(F)\right) \bowtie \rho^m_{p_{id}}(K)\right)$
`(a)-[FriendOf]->(b)-[FriendOf]->(c),` `(c)-[FriendOf]->(d), (c)-[Knows]->(d)`	Three Hops And Branch	$\widetilde{\pi}_m\left(\rho^m_{f_{id}}\left(\widetilde{\pi}_m(\rho^m_{f_{id}}(F) \bowtie \rho^m_{p_{id}}(F)\right) \bowtie \rho^m_{p_{id}}(F) \bowtie \rho^m_{p_{id}}(K)\right)$
`(a)-[FriendOf]->(b)-[FriendOf]->(c),` `(c)-[FriendOf]->(d), (b)-[Knows]->(d)`	Three Hops And Branch	$\widetilde{\pi}_{m,n}\left(\rho^n_{f_{id}}\left(\rho^m_{f_{id}}(F) \bowtie \rho^m_{p_{id}}(F)\right) \bowtie \rho^n_{f_{id}}(F) \bowtie \rho^m_{p_{id}}(K)\right)$
`(a)-[FriendOf]->(b)-[FriendOf]->(c),` `(c)-[FriendOf]->(d), (b)-[Knows]->(d)`	Three Hops And Branch	$\widetilde{\pi}_{m,n}\left(\left(\rho^m_{f_{id}}(F) \bowtie \rho^{m,n}_{p_{id},f_{id}}(F)\right) \bowtie \rho^n_{p_{id}}(F) \bowtie \rho^m_{p_{id}}(K)\right)$