HW 4 Heterogeneous Graphs

We enumerate the graphs based on the total number of edges. By property of *Complementarity*, we only need to enumerate graphs with edge numbers ranging from 0 to 5.

1. We have 1 graph for 0 edge.
2. We have 1 graph for 1 edge, shown in Figure 1.
3. We have 2 graph for 2 edges, showin in Figure 2.
4. We have 4 graphs for 3 edges, showin in Figure 3.
5. We have 6 graphs for 4 edges, showin in Figure 4.
6. We have 6 graphs for 5 edges, showin in Figure 4, where the second and third graphs are symmetric, and the fourth and fifth graphs are also symmetric. The first and sixth graphs are symmetric with respect to themselves respectively.

Totally, we have $(1 + 1 + 2 + 4 + 6) * 2 + 6 = 34$ heterogeneous graphs.

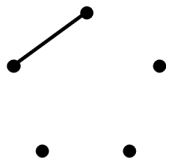

Figure 1: Heterogeneous Graphs with 1 edge

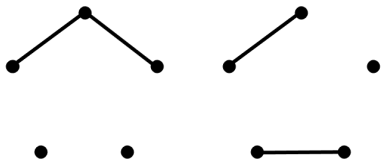

Figure 2: Heterogeneous Graphs with 2 edges

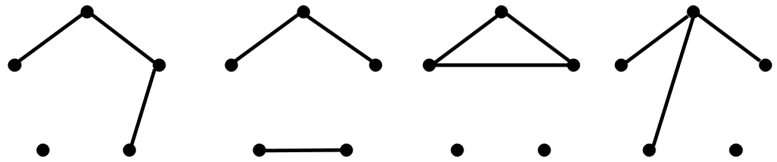

Figure 3: Heterogeneous Graphs with 3 edges

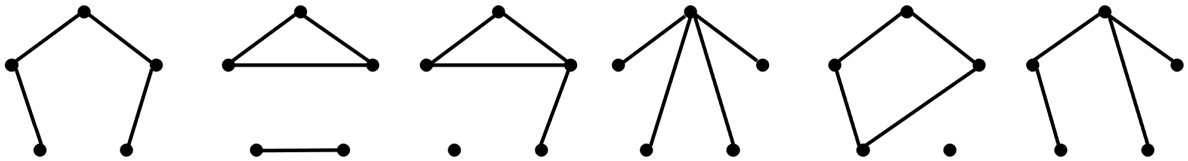

Figure 4: Heterogeneous Graphs with 4 edges

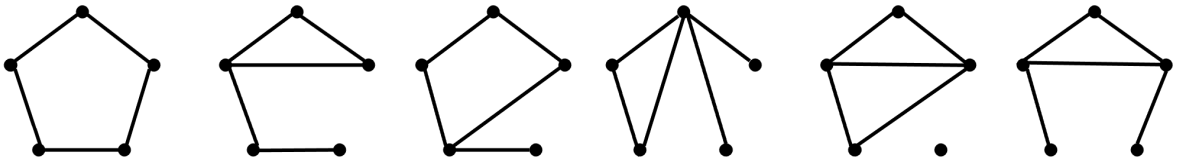

Figure 5: Heterogeneous Graphs with 5 edges