Please do your homework using an R script.

* Make sure your code is well-organized by each question and well-commented.
* You should always avoid hardcoding. For instance, you should never manually count the length of a vector but should use the length( ) function instead.
* For some problems, a suggested name for the R object you are asked to create is given. It is only a suggestion and you do not have to use the exact name. When a suggested name is not given, you should choose names that are descriptive and concise.

**NOTE**: Homework is NOT collected in this class. However, on the day it is due, you may be asked to share your screen and run some of your code when we discuss this homework in class. This will count towards your participation grade.

1. Create the following network. Answer the questions without R first, then with R.  
     
   A picture containing table, board, sitting, man

   Description automatically generated
   1. What is its order?
   2. What is its size?
   3. is incident on how many edges?
   4. Create a new network like the old one. Change the labels for and to ‘?’ and ‘!’ respectively, but keep their names the same.
   5. Add vertex and to the graph, and edges between and A, and and . Don’t forget to add their labels.
   6. Set weights for all the edges to 2, except the two new ones which should have weight 1. Use the function get.edge.ids() to find the indices of the new edges.
   7. Label the edges with their weights.
   8. Graph the old network and the new one side-by-side.
2. Create the following digraph, paying attention to the colors (pink for the vertices, purple for the letters).  
     
   A close up of a necklace

   Description automatically generated  
   1. What is its order?
   2. What is its size?
   3. Create a new graph like the old one. Create an edge from W8 toW5, and two edges from W8 to W9.
   4. Simplify this multigraph, then label the edges with their weights.
   5. Plot both old and new graph, with the new one underneath the old one.
   6. Give a summary of the new graph.