```
(*Problem 1.*)
ClearAll["Global`*"]
```

In[25]:=
```
(*1*)
edgeList = {1 ↔ 2, 2 ↔ 3, 2 ↔ 4, 3 ↔ 1, 3 ↔ 2, 4 ↔ 1, 6 ↔ 1, 6 ↔ 3};
```

In[26]:=
```
(*2*)
A = {{0, 1, 0, 0, 0, 0}, {0, 0, 1, 1, 0, 0}, {1, 1, 0, 0, 0, 0}, {1, 0, 0, 0, 0, 0}, {0, 0, 0, 0, 0, 0}, {1, 0, 1, 0, 0, 0}};
```

In[37]:=
```
(*3*)
SparseArray[A] // InputForm
```

Out[37]//InputForm=
```
SparseArray[Automatic, {6, 6}, 0, {1, {{0, 1, 3, 5, 6, 6, 8}, {{2}, {3}, {4}, {1}, {2}, {1}, {3}}}, {1, 1, 1, 1, 1, 1, 1, 1}}]
```

In[38]:=
```
(*4*)
edgeList = edgeList /. (DirectedEdge → UndirectedEdge)
A + A^T // MatrixForm
```

Out[38]= $\{1 \leftrightarrow 2, 2 \leftrightarrow 3, 2 \leftrightarrow 4, 3 \leftrightarrow 1, 3 \leftrightarrow 2, 4 \leftrightarrow 1, 6 \leftrightarrow 1, 6 \leftrightarrow 3\}$

Out[39]//MatrixForm=

$$\begin{pmatrix} 0 & 1 & 1 & 1 & 0 & 1 \\ 1 & 0 & 2 & 1 & 0 & 0 \\ 1 & 2 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \end{pmatrix}$$

In[40]:=
```
LocalClusteringCoefficient[AdjacencyGraph[A + A^T]]
MeanClusteringCoefficient[AdjacencyGraph[A + A^T]]
```

Out[40]= $\left\{\frac{1}{2}, \frac{2}{3}, \frac{2}{3}, 1, 0, 1\right\}$

Out[41]= $\frac{23}{36}$

In[35]:=
```
(*5*)
edgeList /. {5 :> 6, 6 :> 5}
```

$$\begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix} \cdot \left(A + A^{\mathsf{T}}\right) \cdot \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix} // \text{MatrixForm}$$

Out[35]= $\{1 \rightarrowtail 2, 2 \rightarrowtail 3, 2 \rightarrowtail 4, 3 \rightarrowtail 1, 3 \rightarrowtail 2, 4 \rightarrowtail 1, 5 \rightarrowtail 1, 5 \rightarrowtail 3\}$

Out[36]//MatrixForm=

$$\begin{pmatrix} 0 & 1 & 1 & 1 & 1 & 0 \\ 1 & 0 & 2 & 1 & 0 & 0 \\ 1 & 2 & 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

It cannot be inferred from the edge list how many vertices are isolated.