

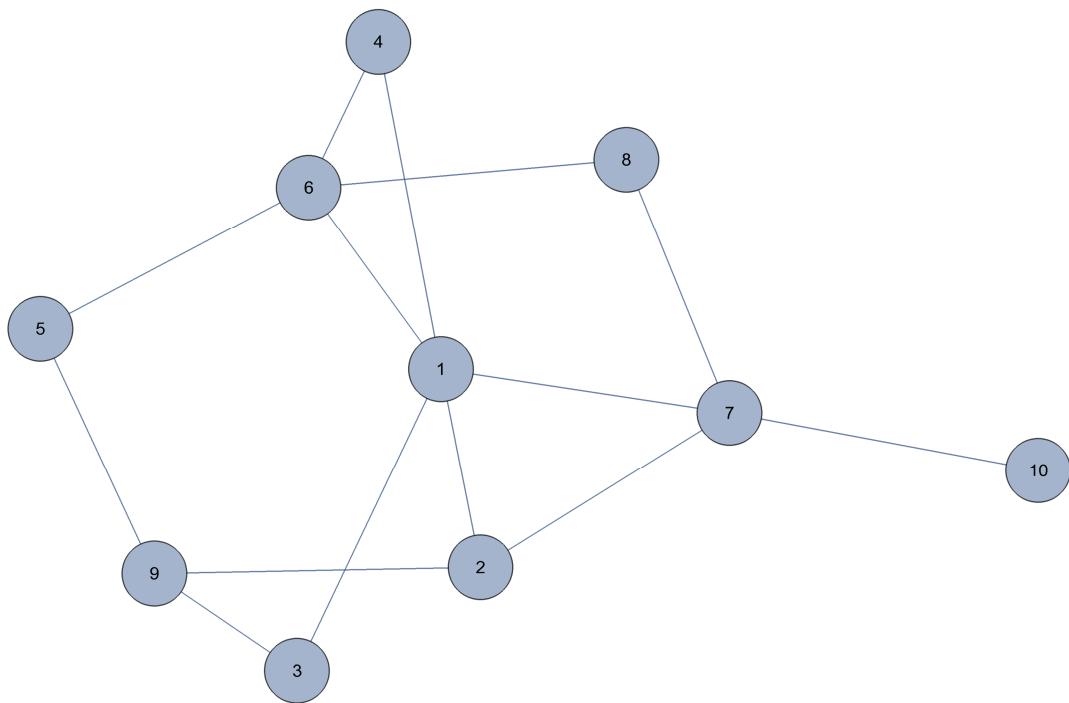
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In[3]:= SetDirectory["C:\\\\Users\\\\tak\\\\Desktop\\\\graph_search"]
```

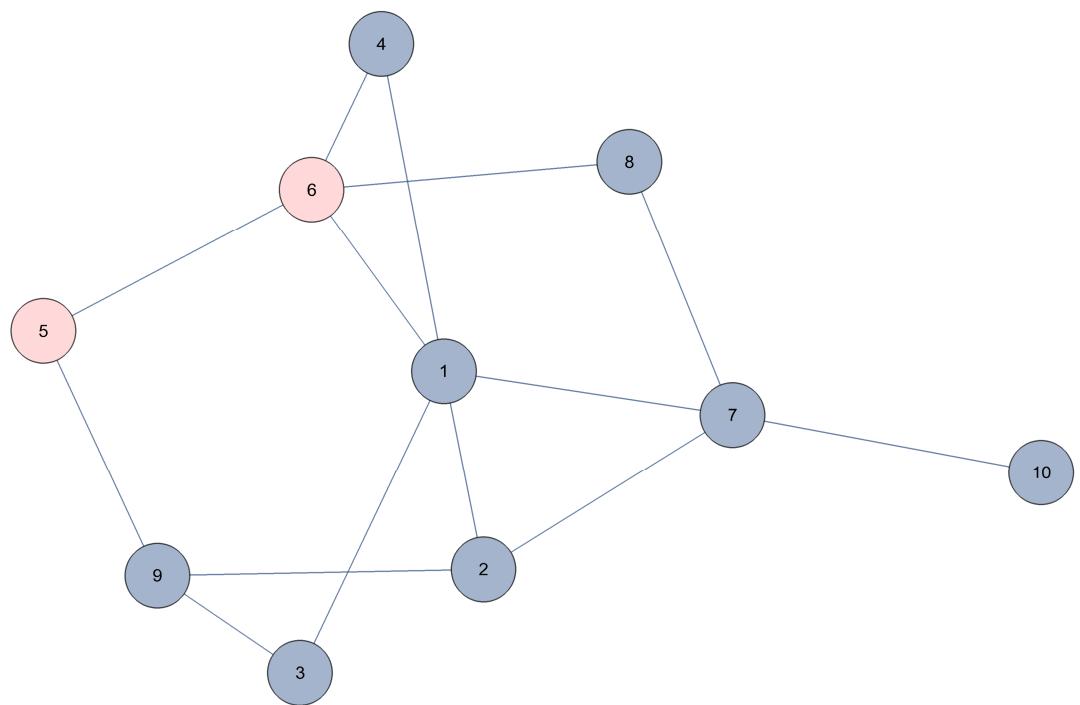
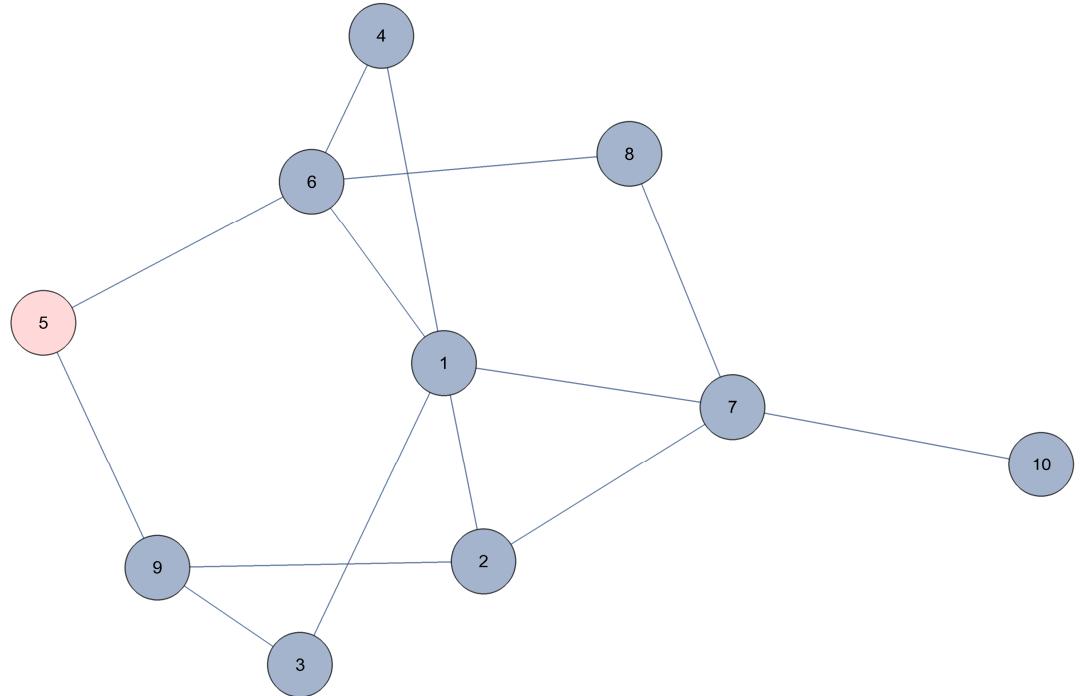
```
Out[3]= C:\\Users\\tak\\Desktop\\graph_search
```

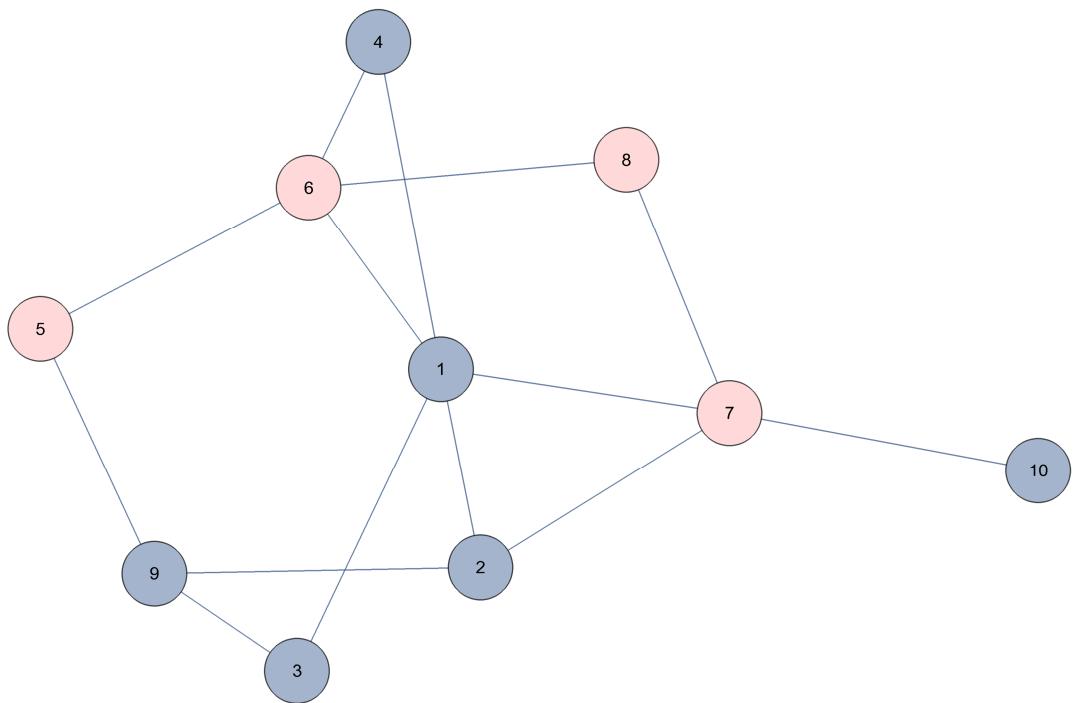
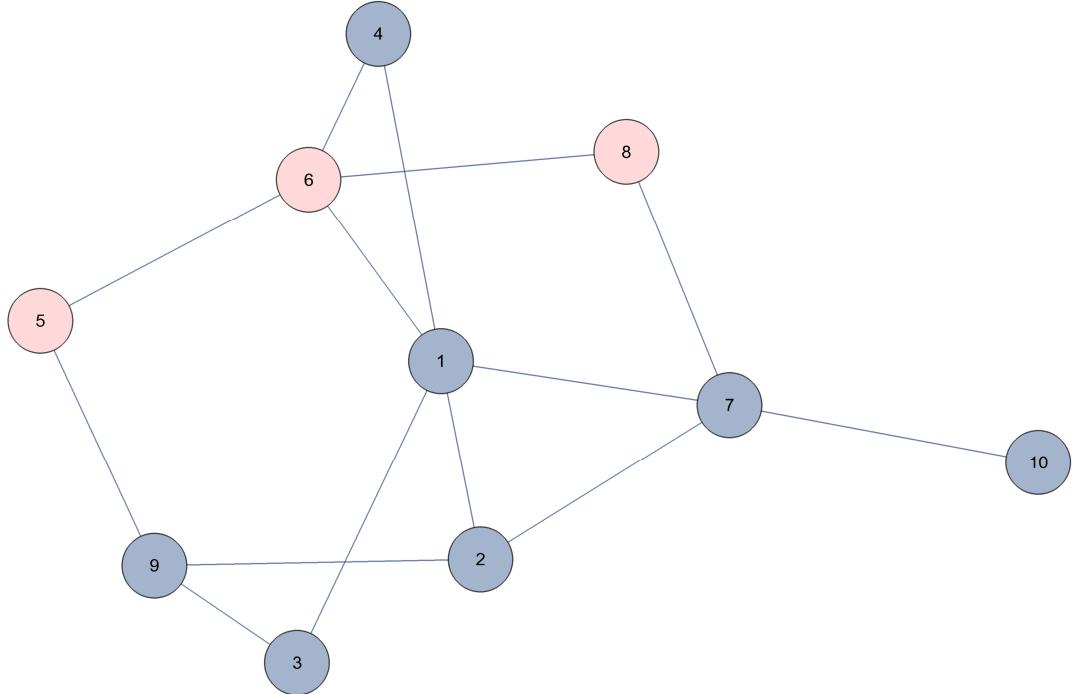
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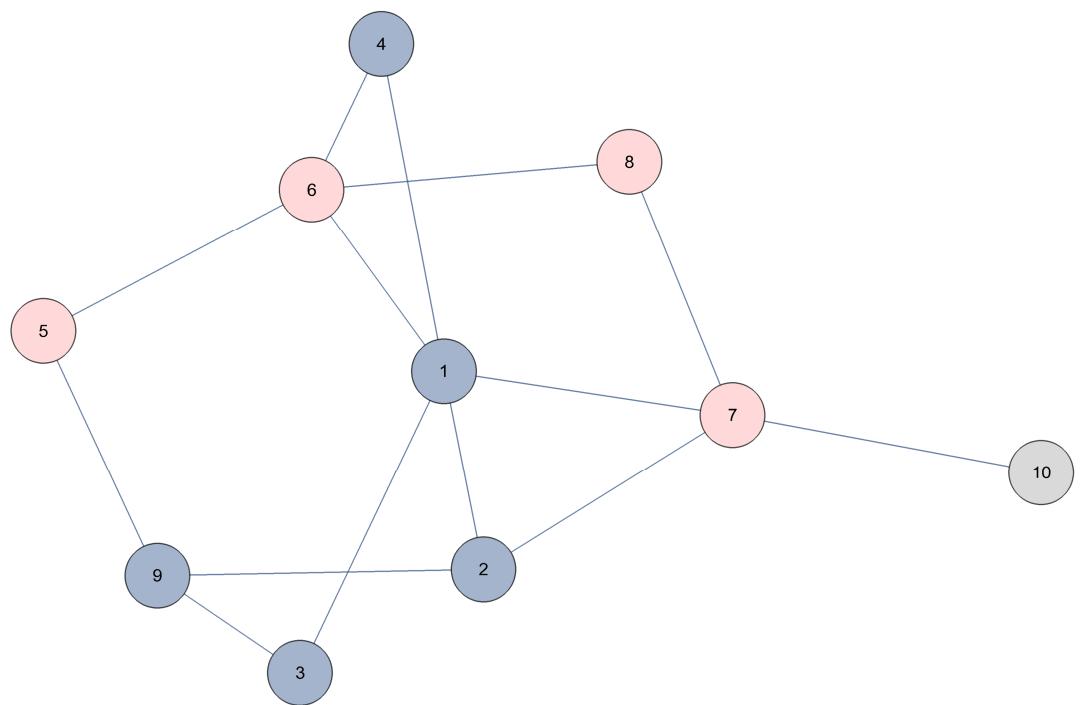
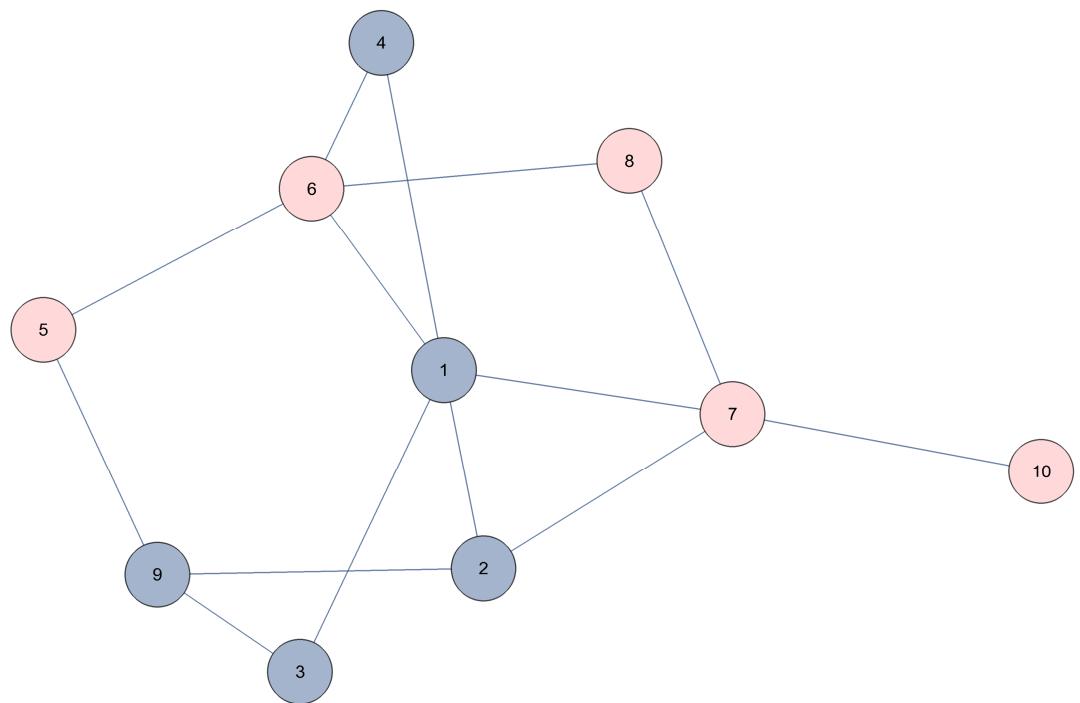
## DFS

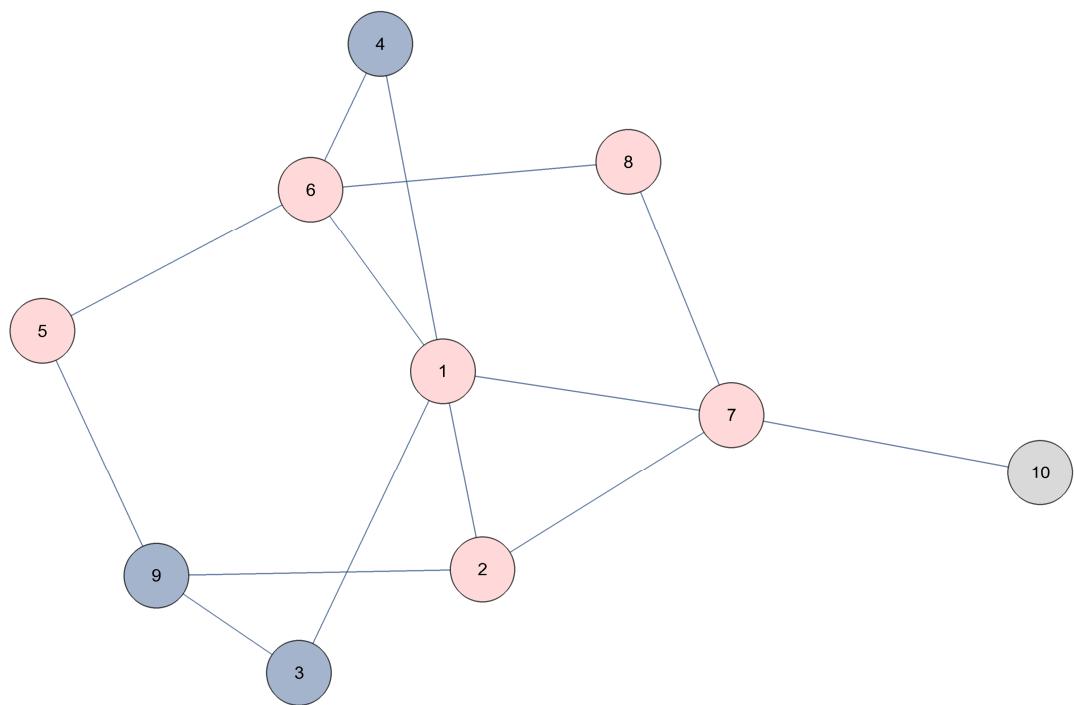
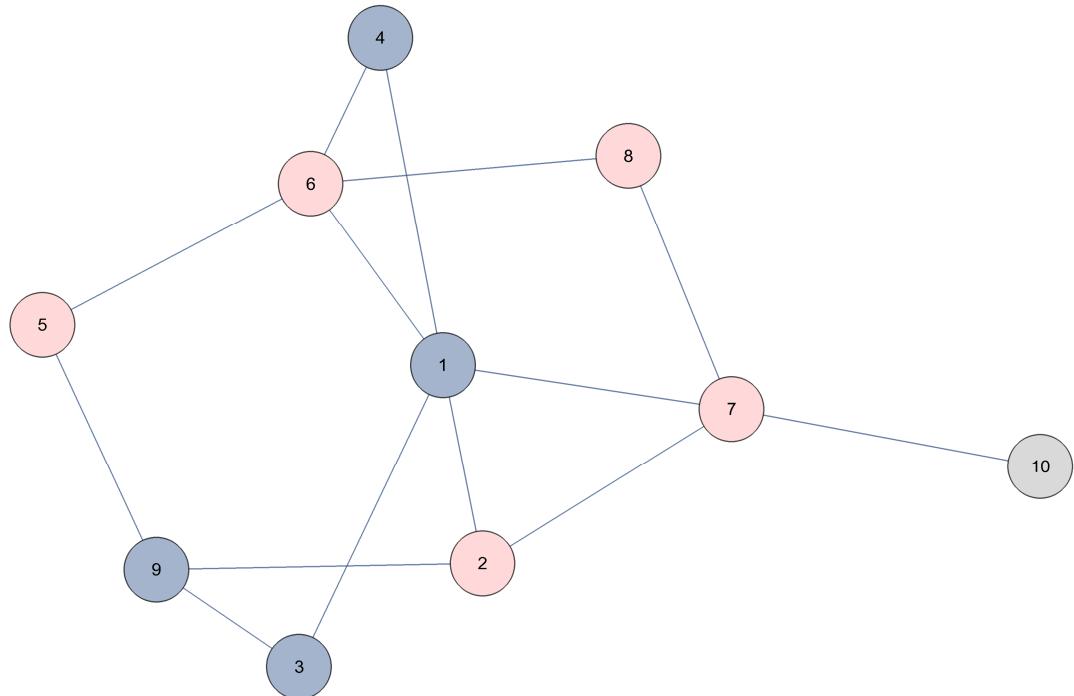
```
Column[Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]},  
GraphPlot[{{1->2},{1->7},{1->8},{2->3},{3->9},{4->5},{4->6},{5->6},{6->1},{6->4},{6->7},{7->10},{8->10}}, VertexStyle -> #, options] & /@  
FoldList[Append, {}, Join[visit /@ {5, 6, 8, 7, 10}, visited /@ {10}, visit /@ {2, 1, 4},  
visited /@ {4}, visit /@ {3, 9}, visited /@ {9, 3, 1, 2, 7, 8, 6, 5}]]]  
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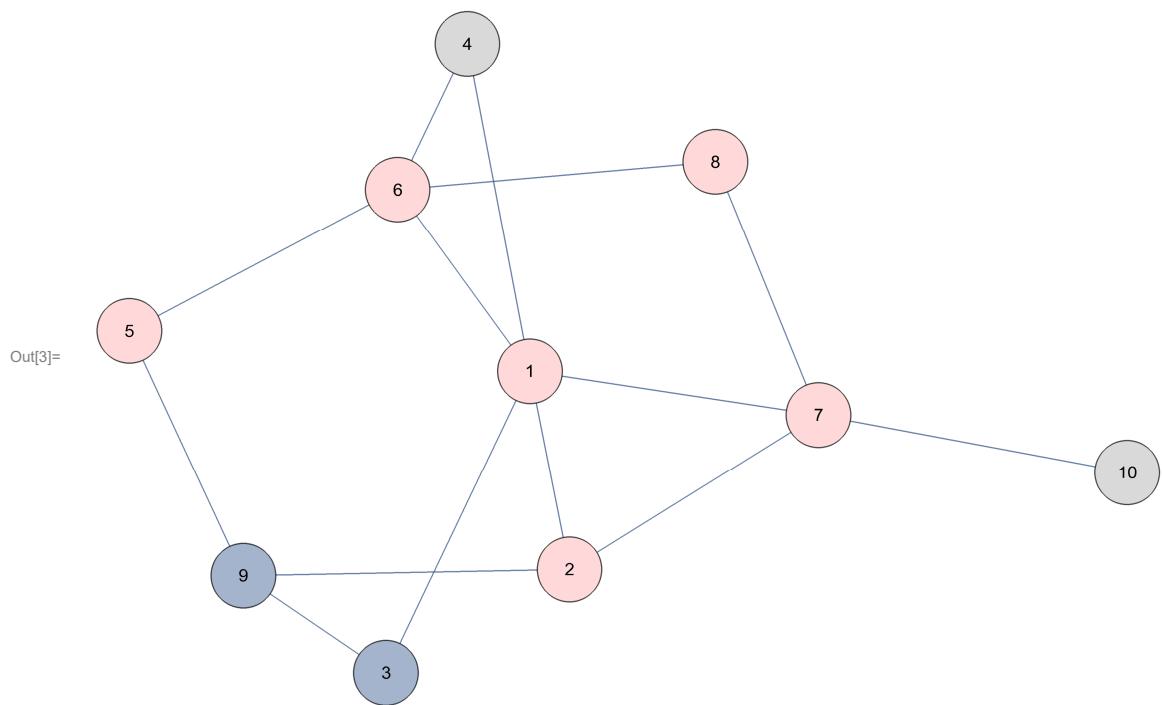
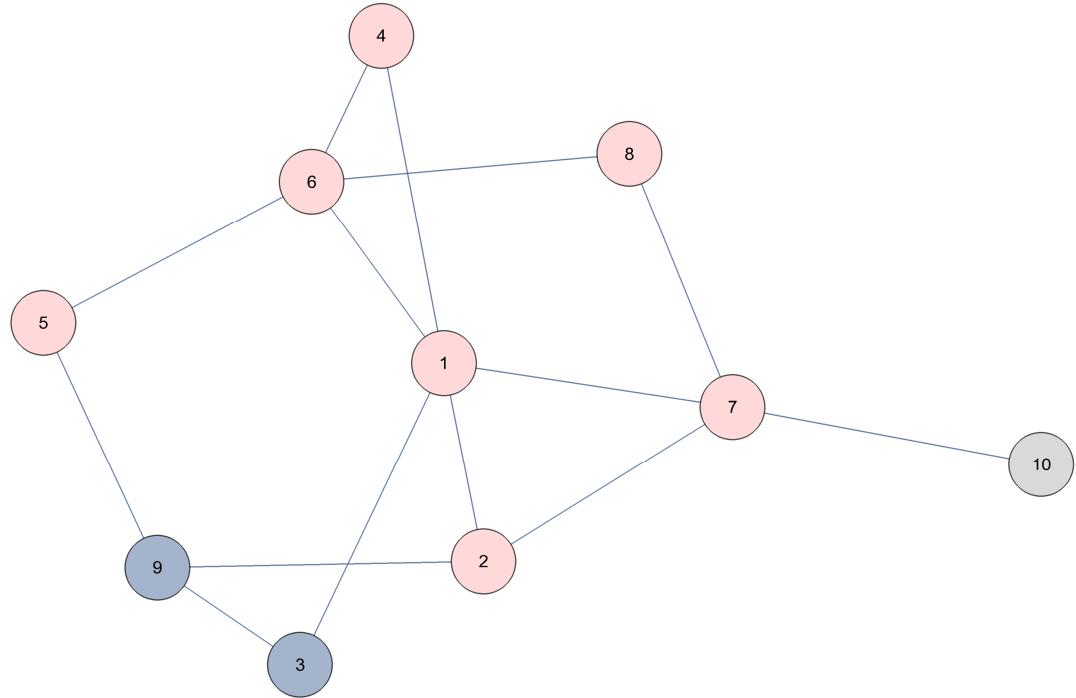


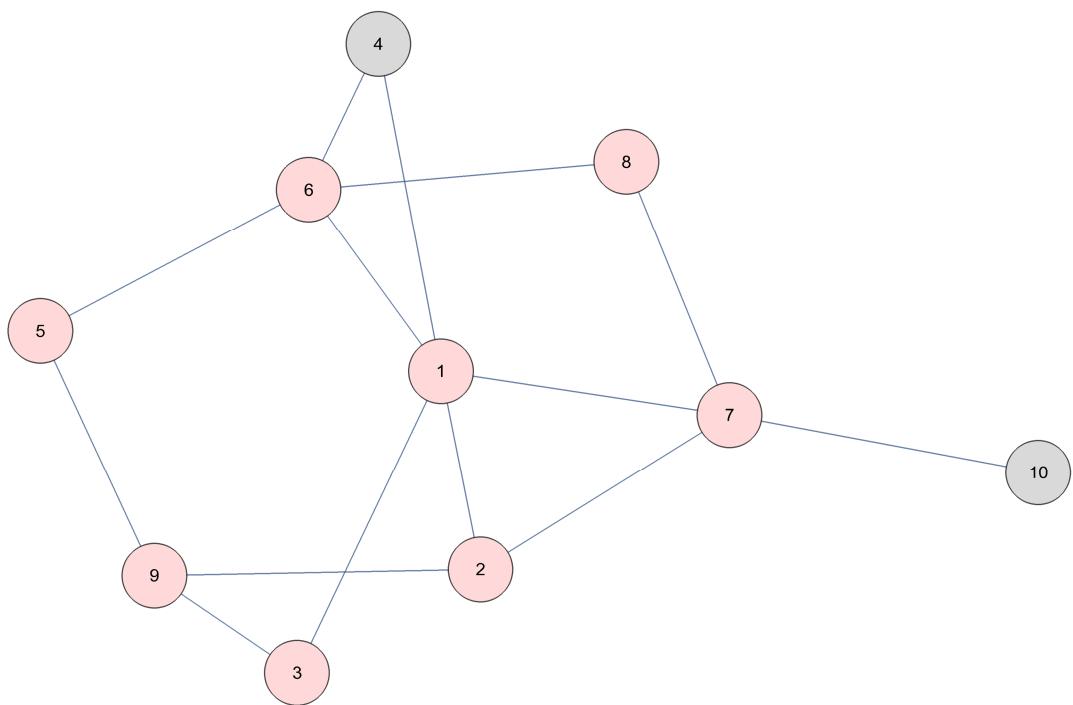
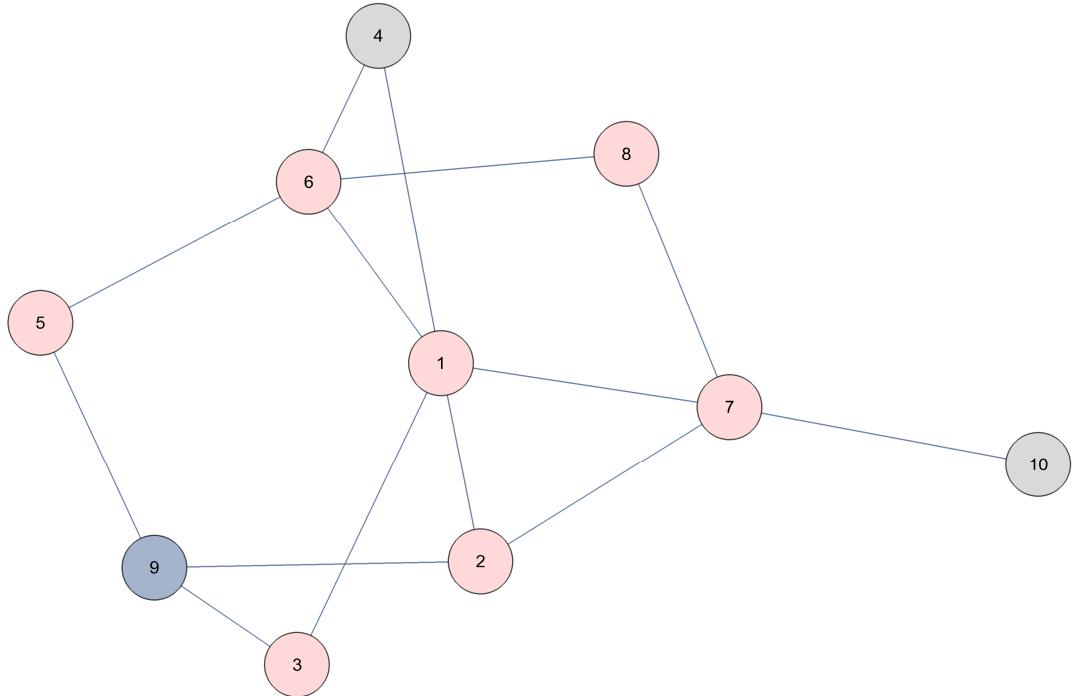


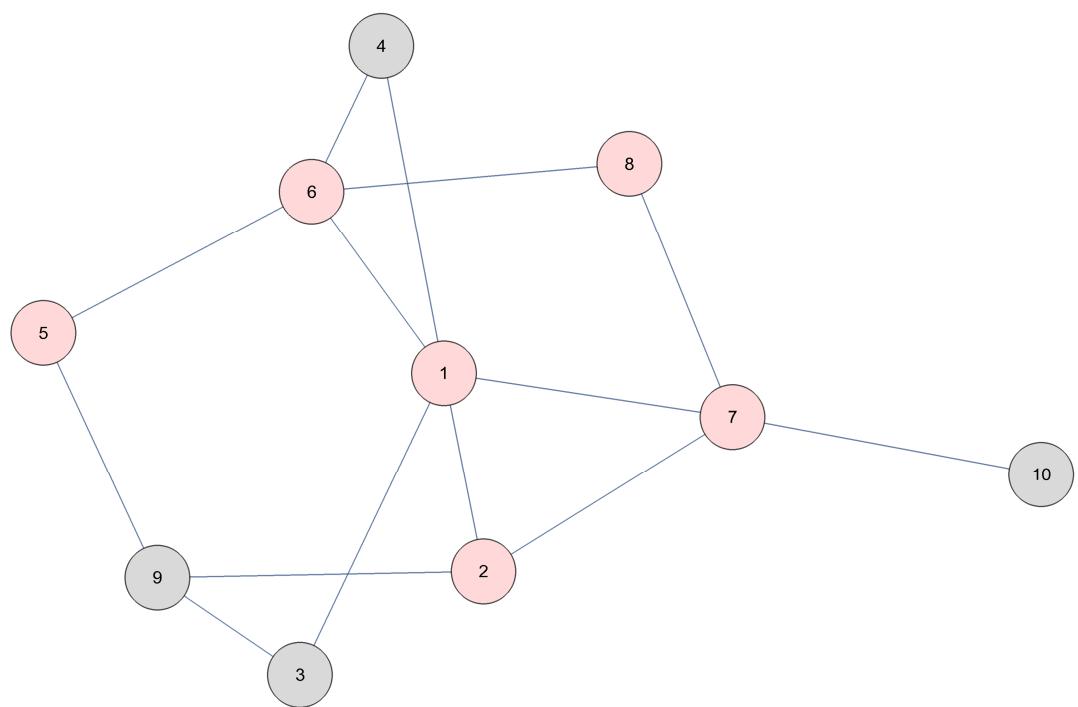
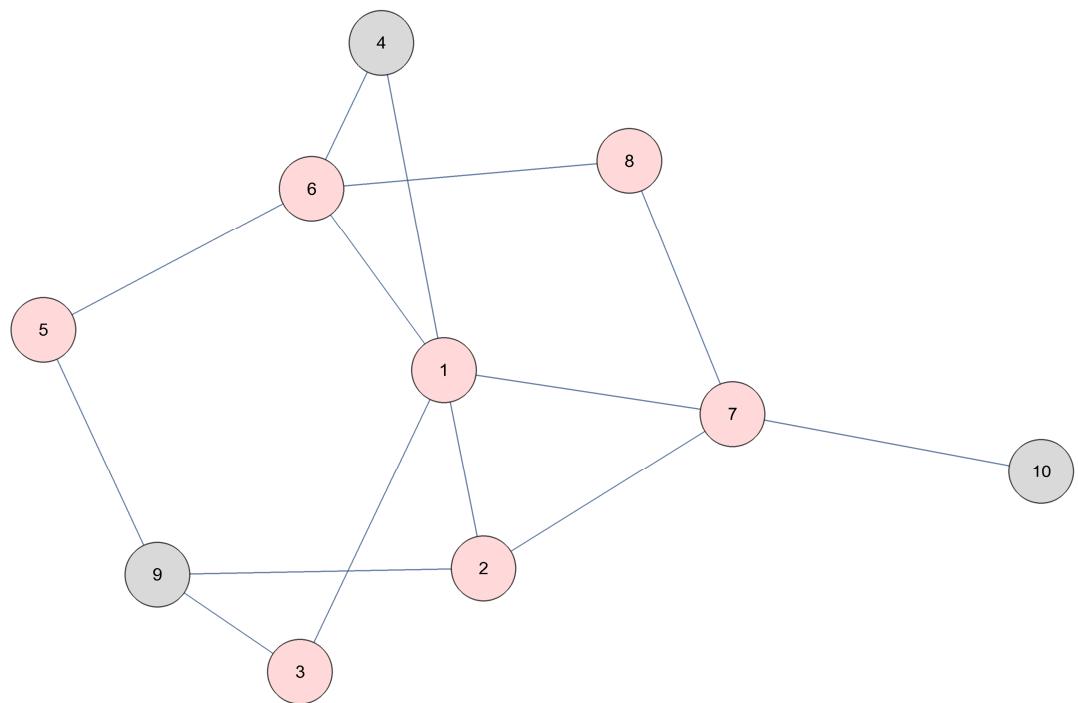


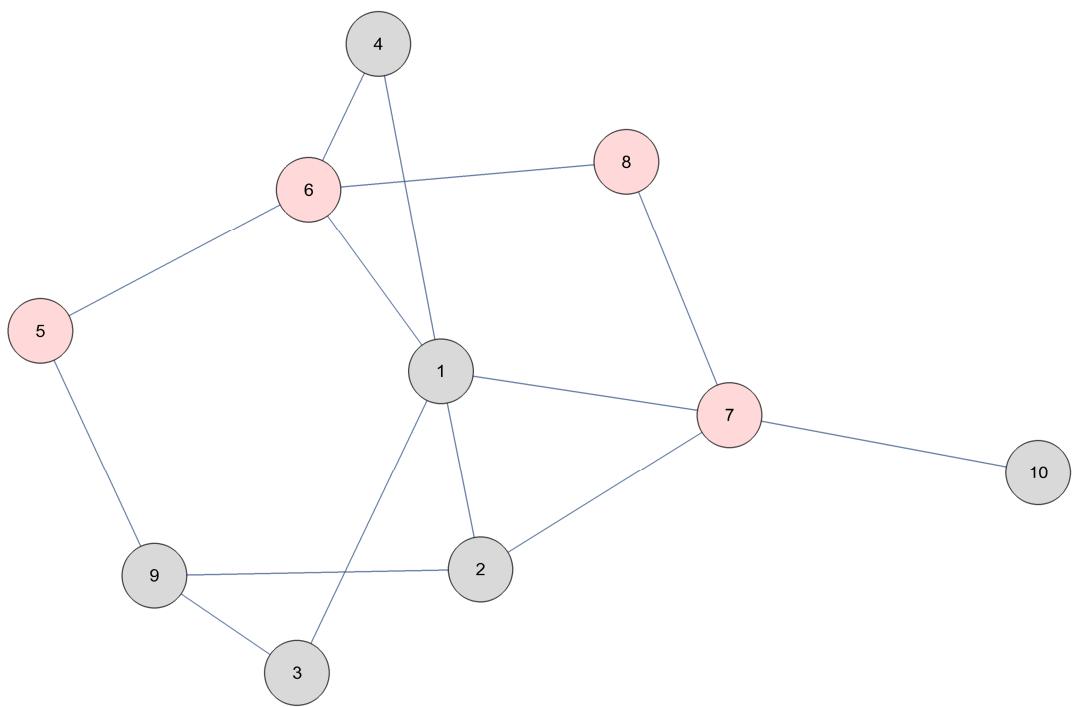
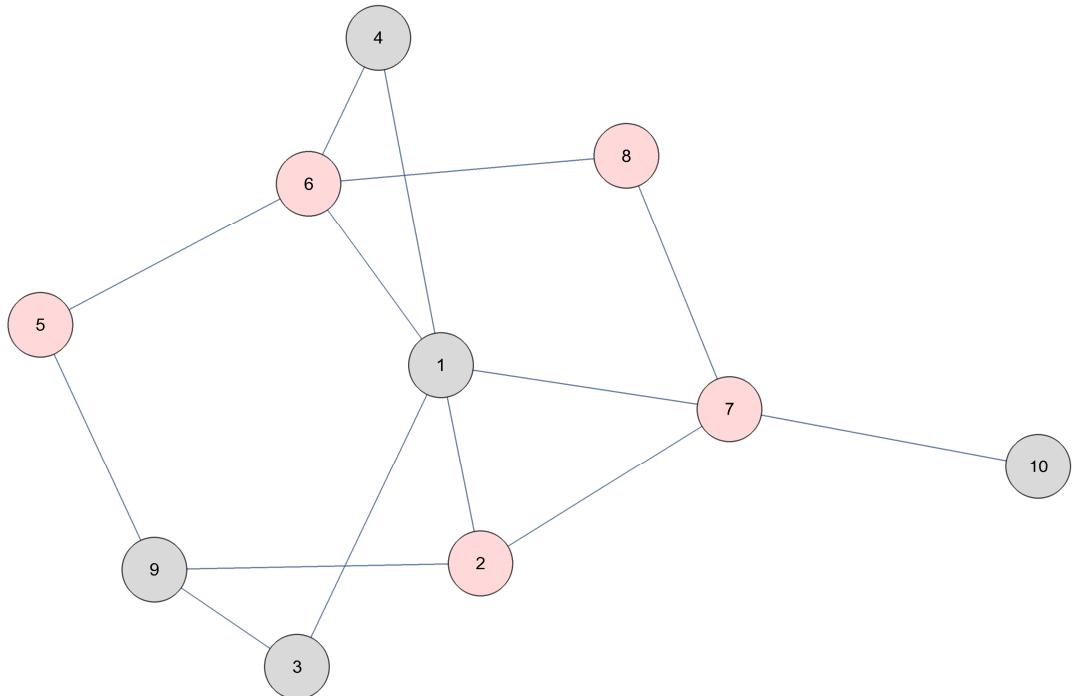


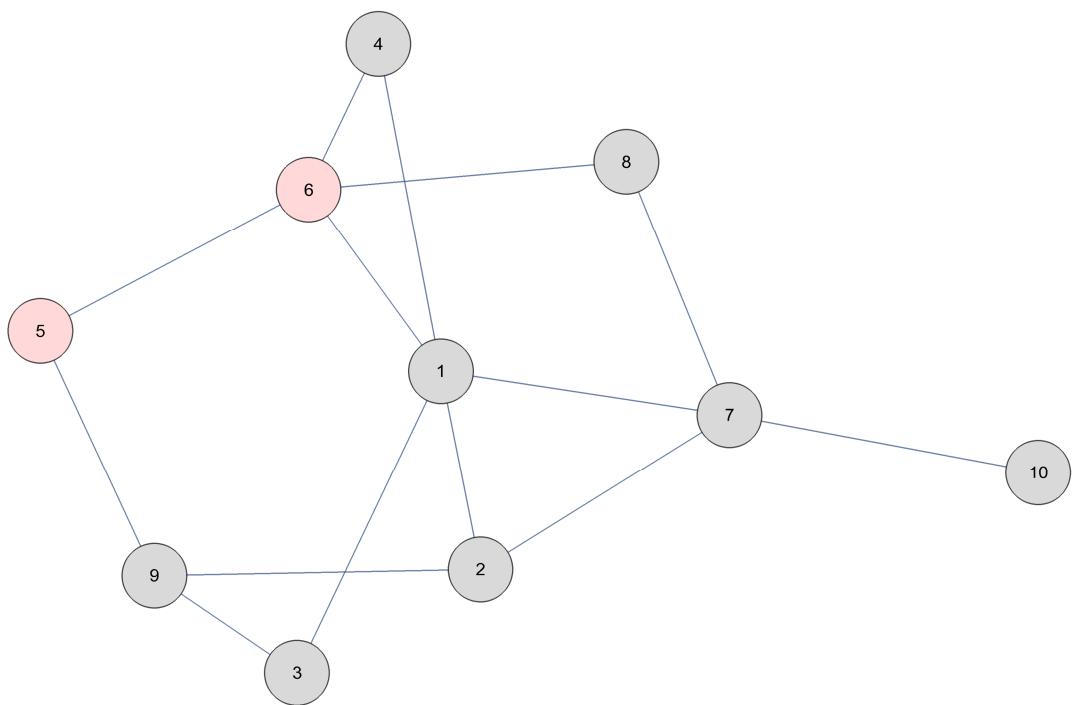
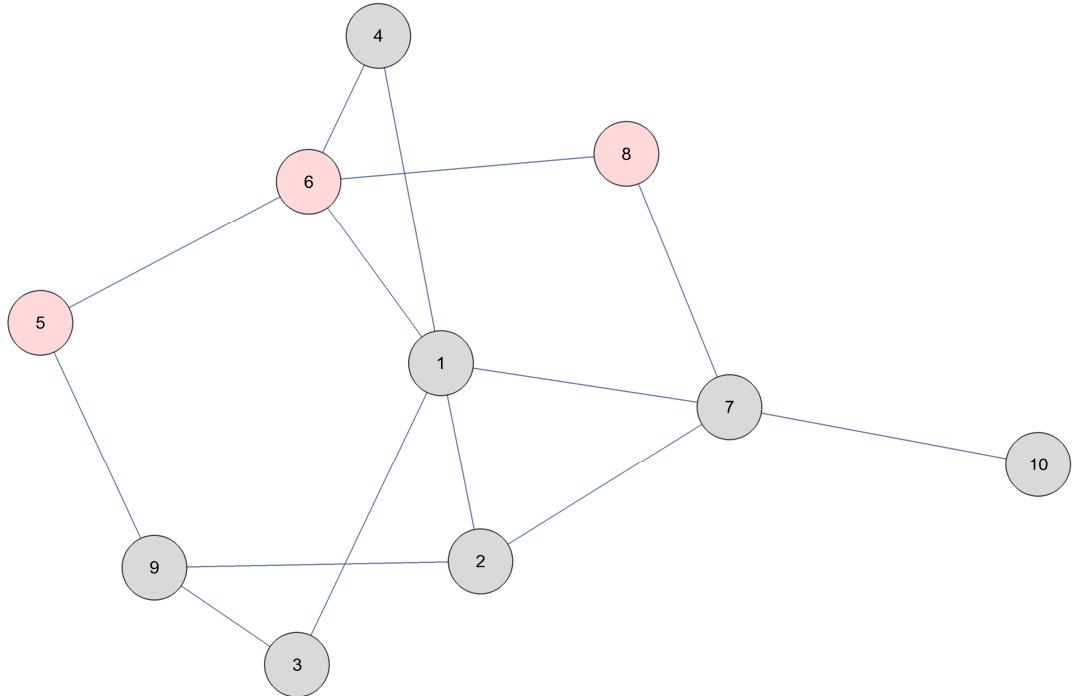


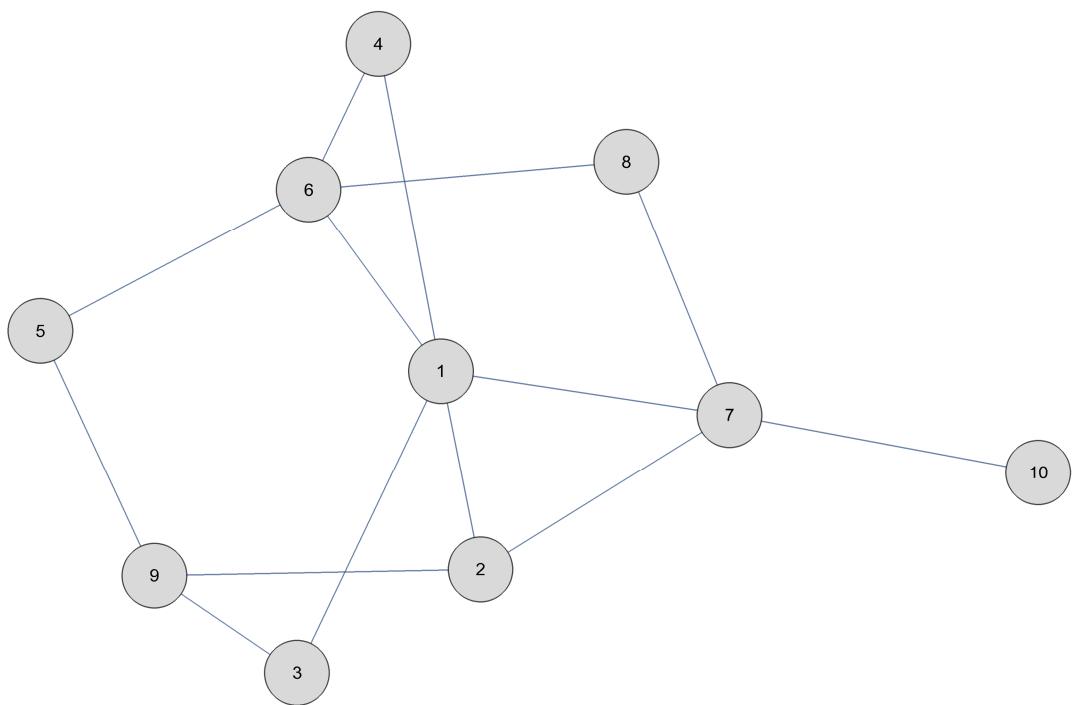
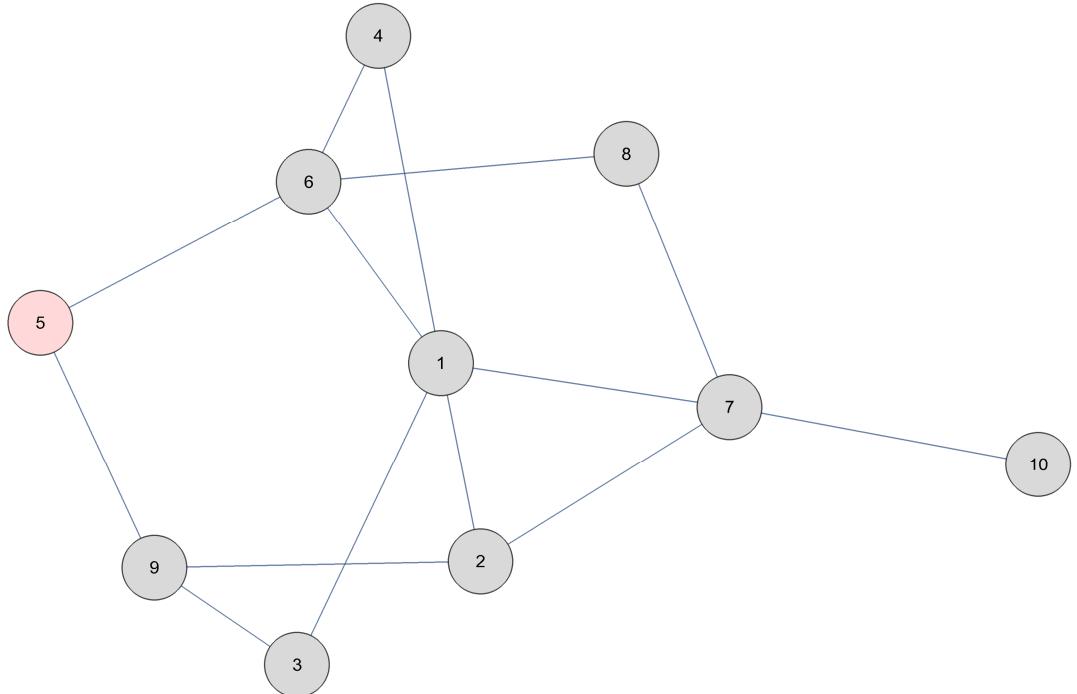








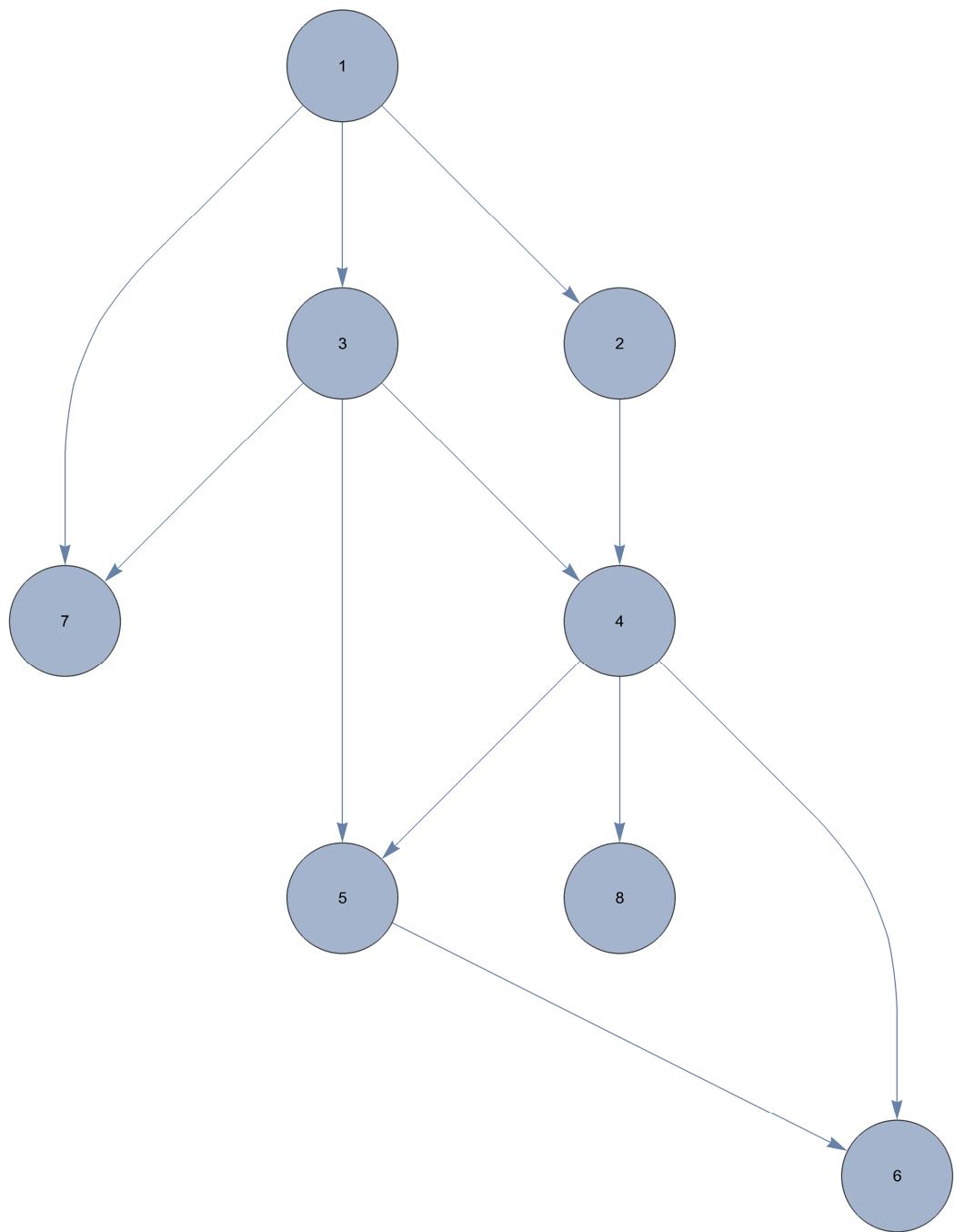


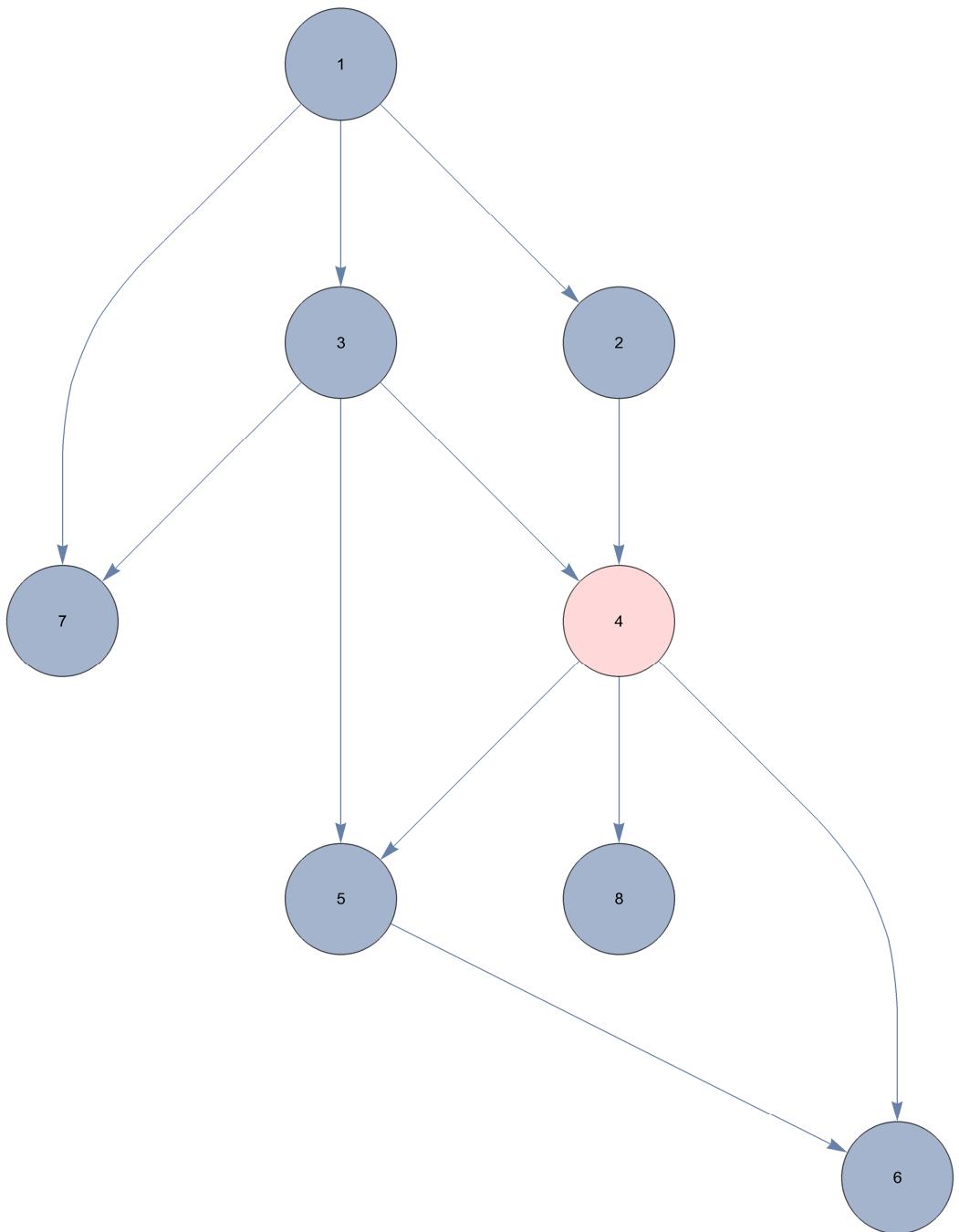


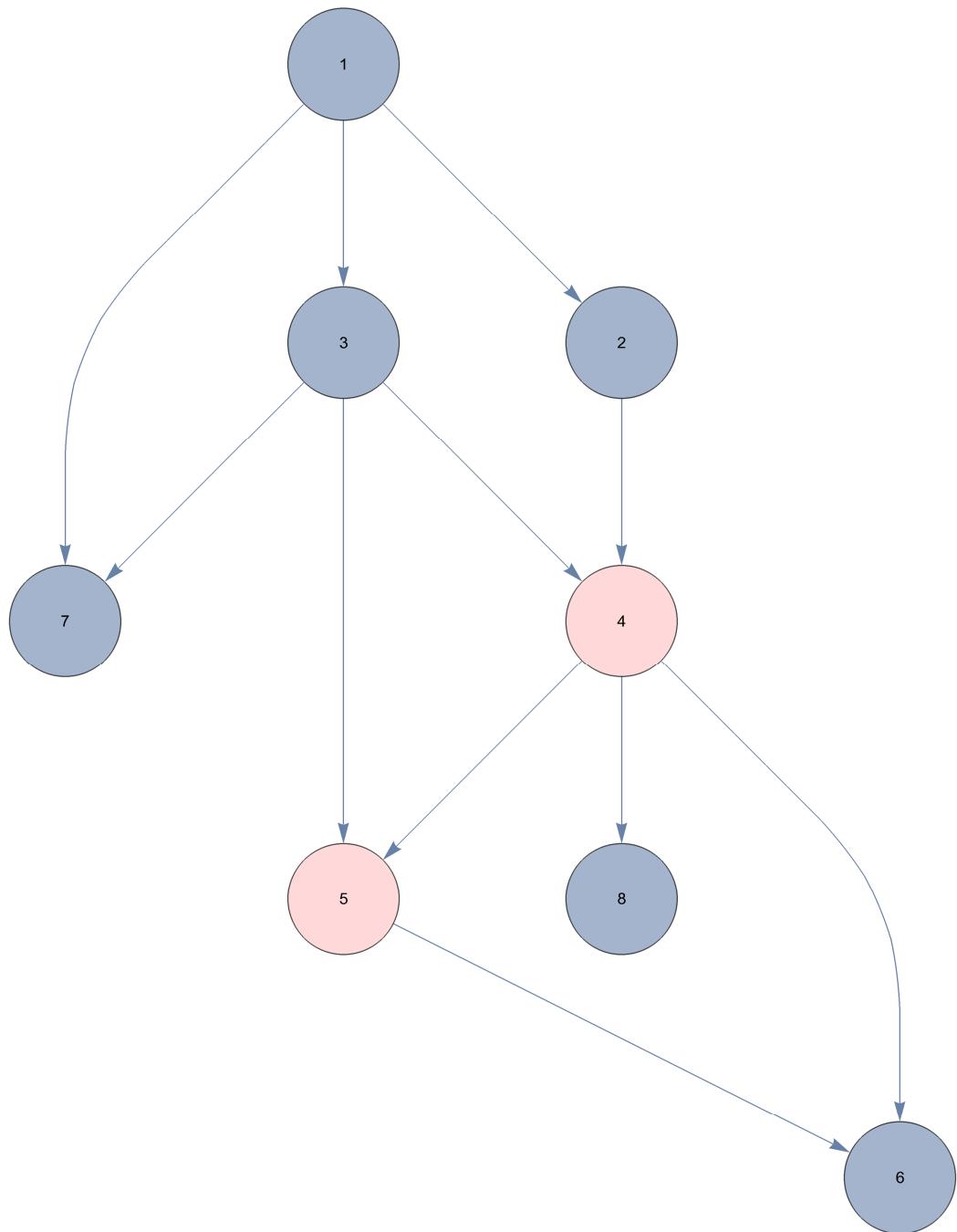
```
In[6]:= Export["dfs.gif", ListAnimate[
Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]}, 
GraphPlot[{{1, 2}, {1, 3}, {2, 4}, {3, 4}, {3, 5}, {4, 5}, {4, 6}, {5, 6}, {5, 7}, {6, 7}, {6, 8}, {7, 8}, {7, 9}, {8, 9}, {8, 10}, {9, 10}}, VertexStyle -> #, options] & /@ FoldList[Append, {}, Join[visit /@ {5, 6, 8, 7, 10}, visited /@ {10}, visit /@ {2, 1, 4}, visited /@ {4}, visit /@ {3, 9}, visited /@ {9, 3, 1, 2, 7, 8, 6, 5}]]], ControlPlacement -> Top
]]
Out[6]= dfs.gif
```

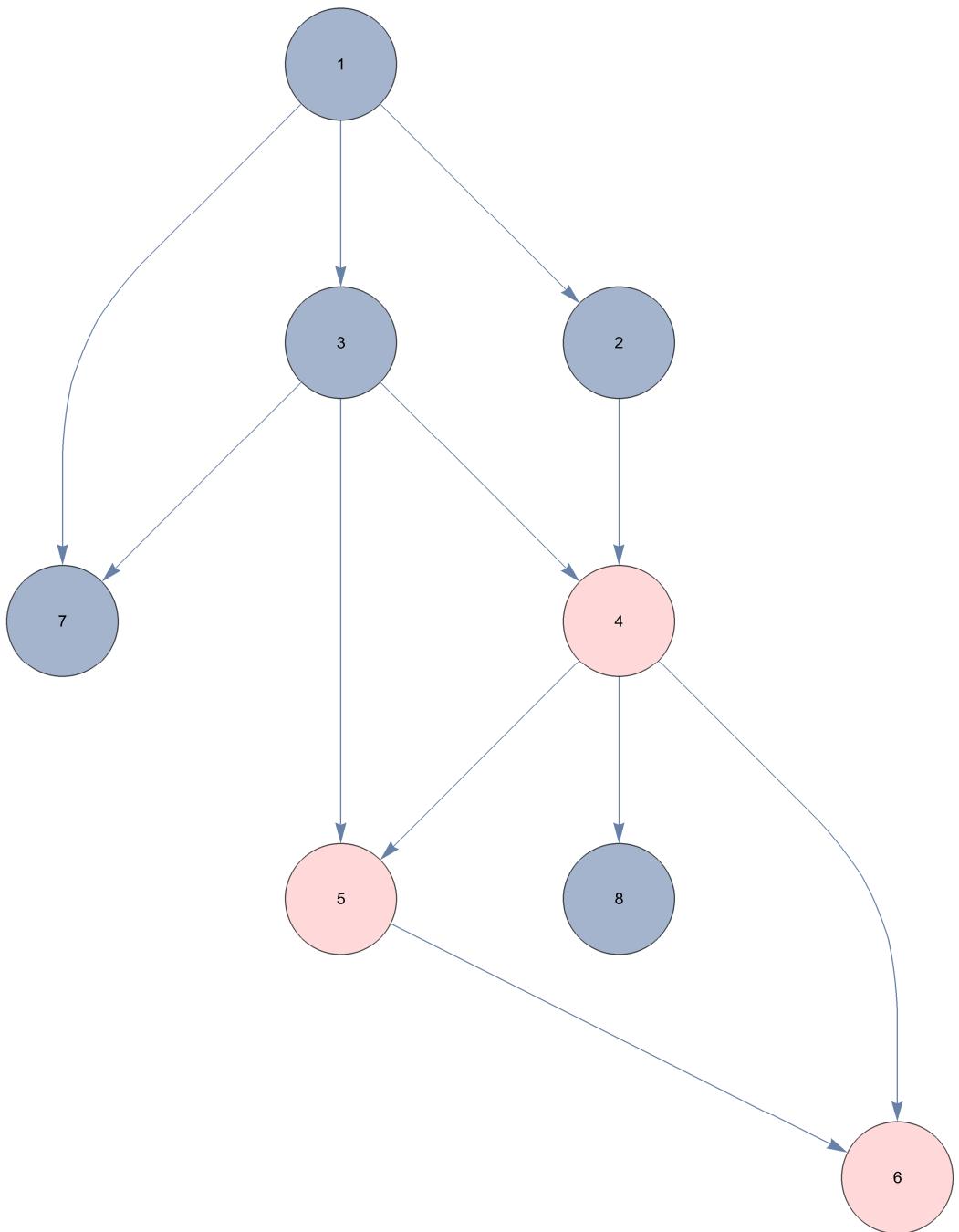
## Topological Sort

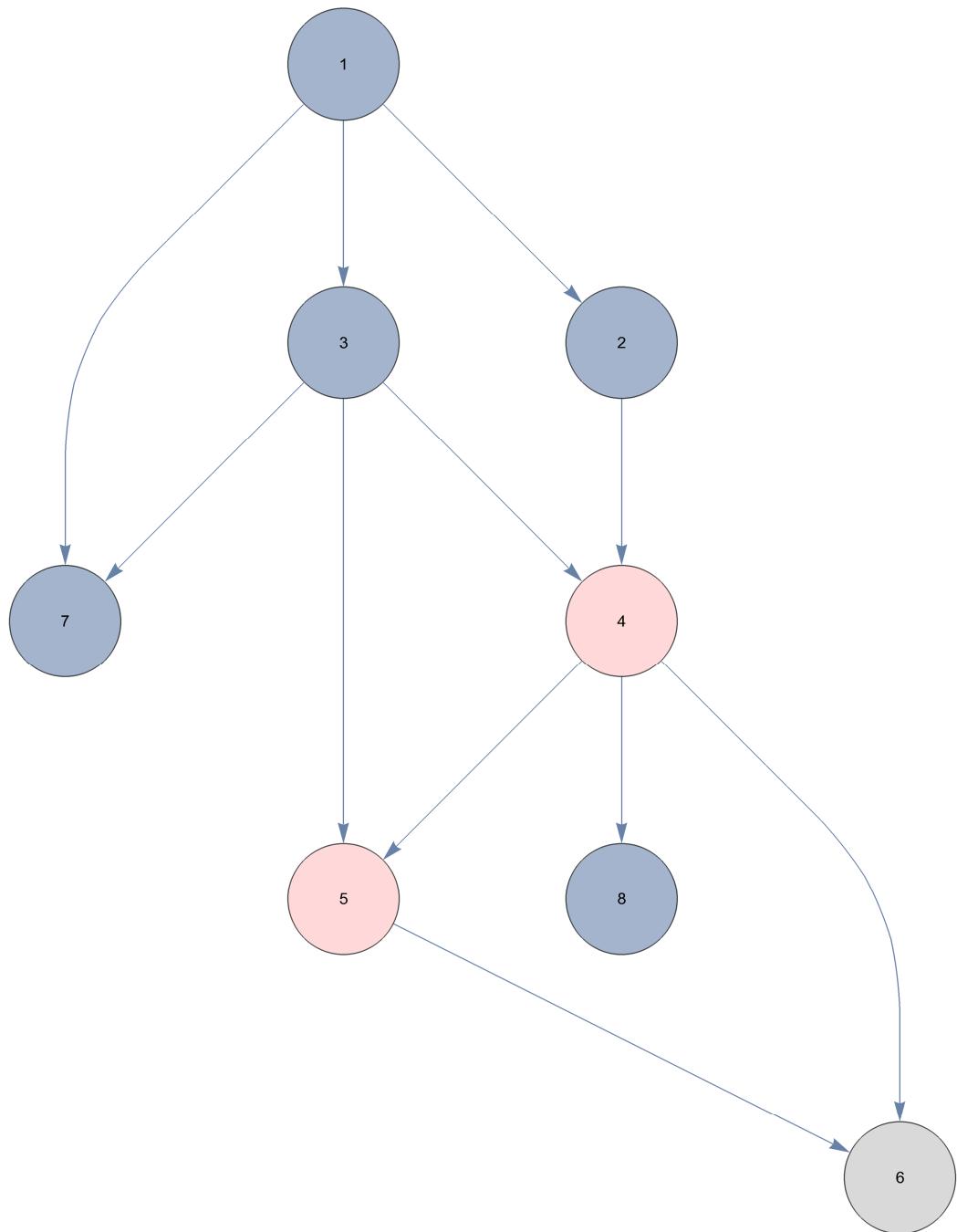
```
In[5]:= Column@
Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]}, 
GraphPlot[{{1, 2}, {1, 3}, {2, 4}, {3, 4}, {3, 5}, {4, 5}, {4, 6}, {5, 6}, {5, 7}, {6, 7}, {6, 8}, {7, 8}, {7, 9}, {8, 9}, {8, 10}, {9, 10}}, VertexStyle -> #, options] & /@ FoldList[Append, {}, 
Join[visit /@ {4, 5, 6}, visited /@ {6, 5}, visit /@ {8}, visited /@ {8, 4}, visit /@ {3, 7}, visited /@ {7, 3}, visit /@ {1, 2}, visited /@ {2, 1}]], 
]
```

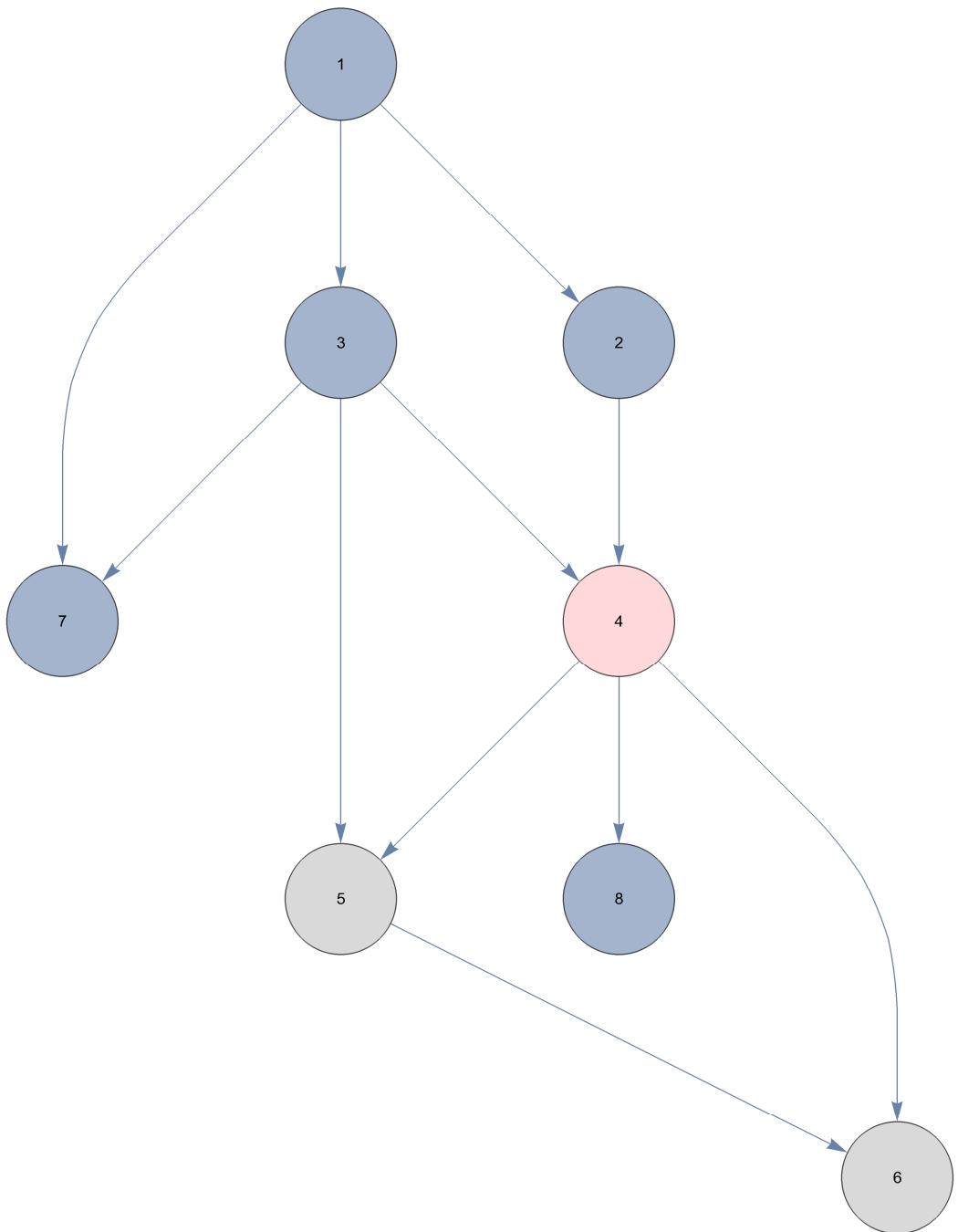


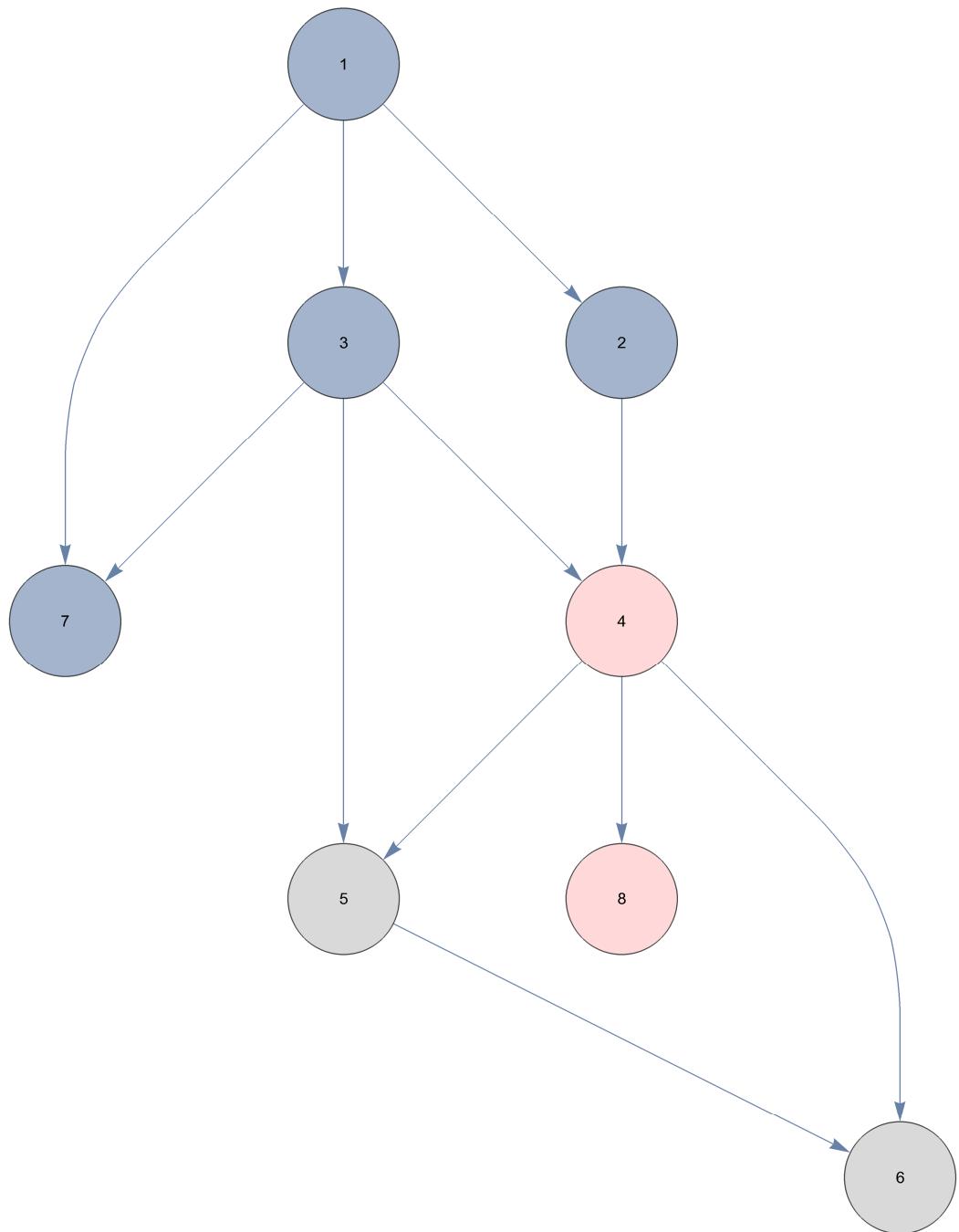


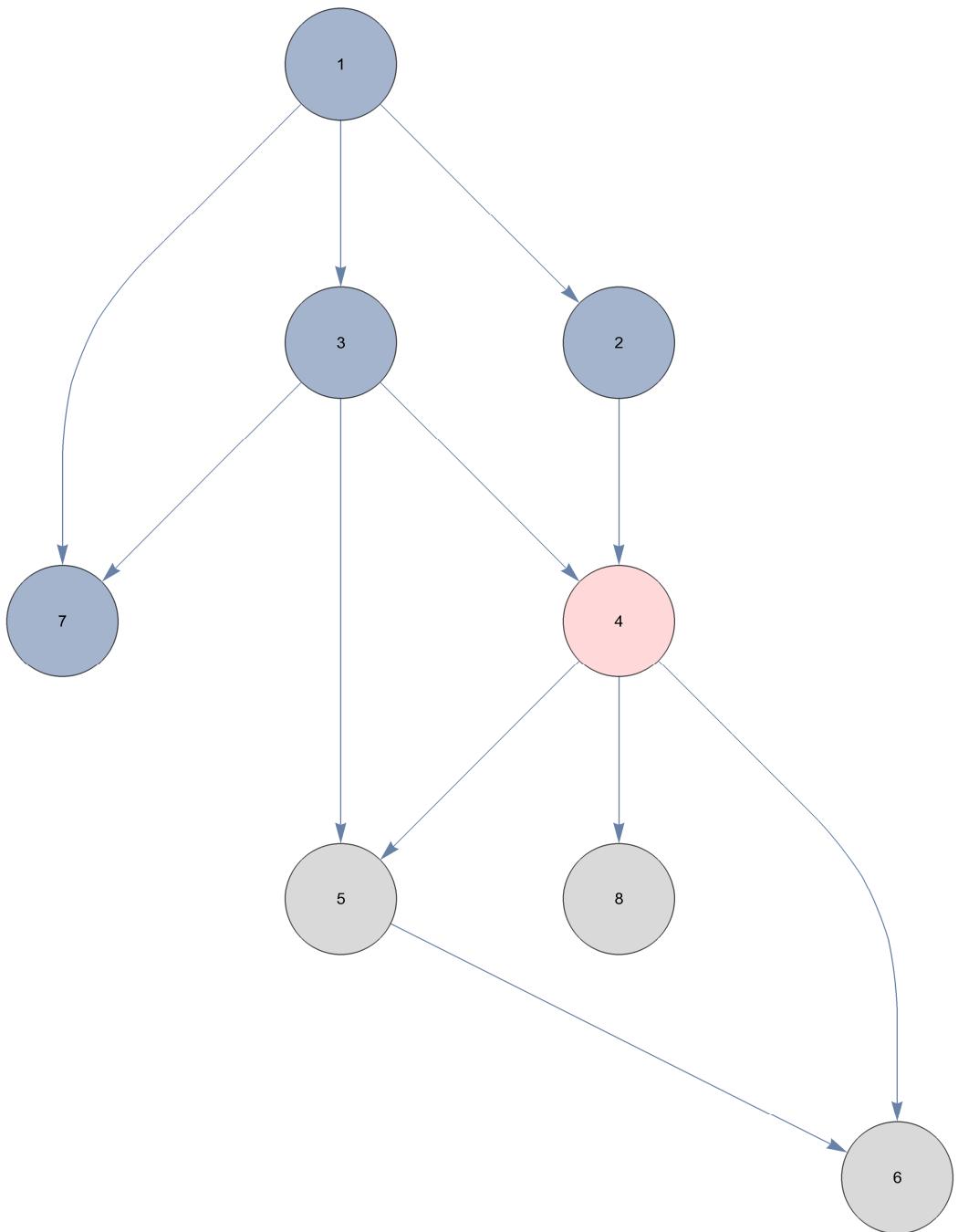


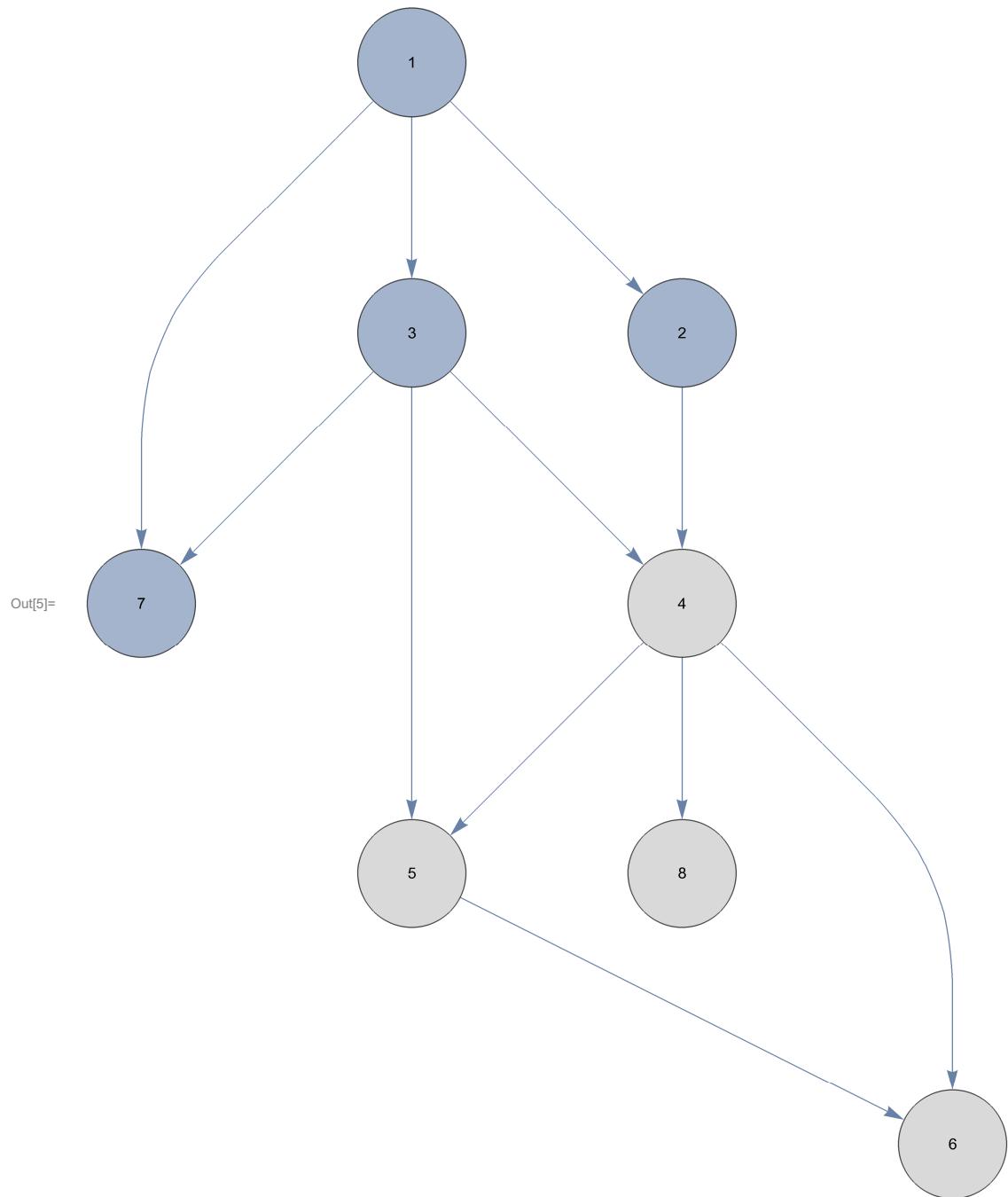


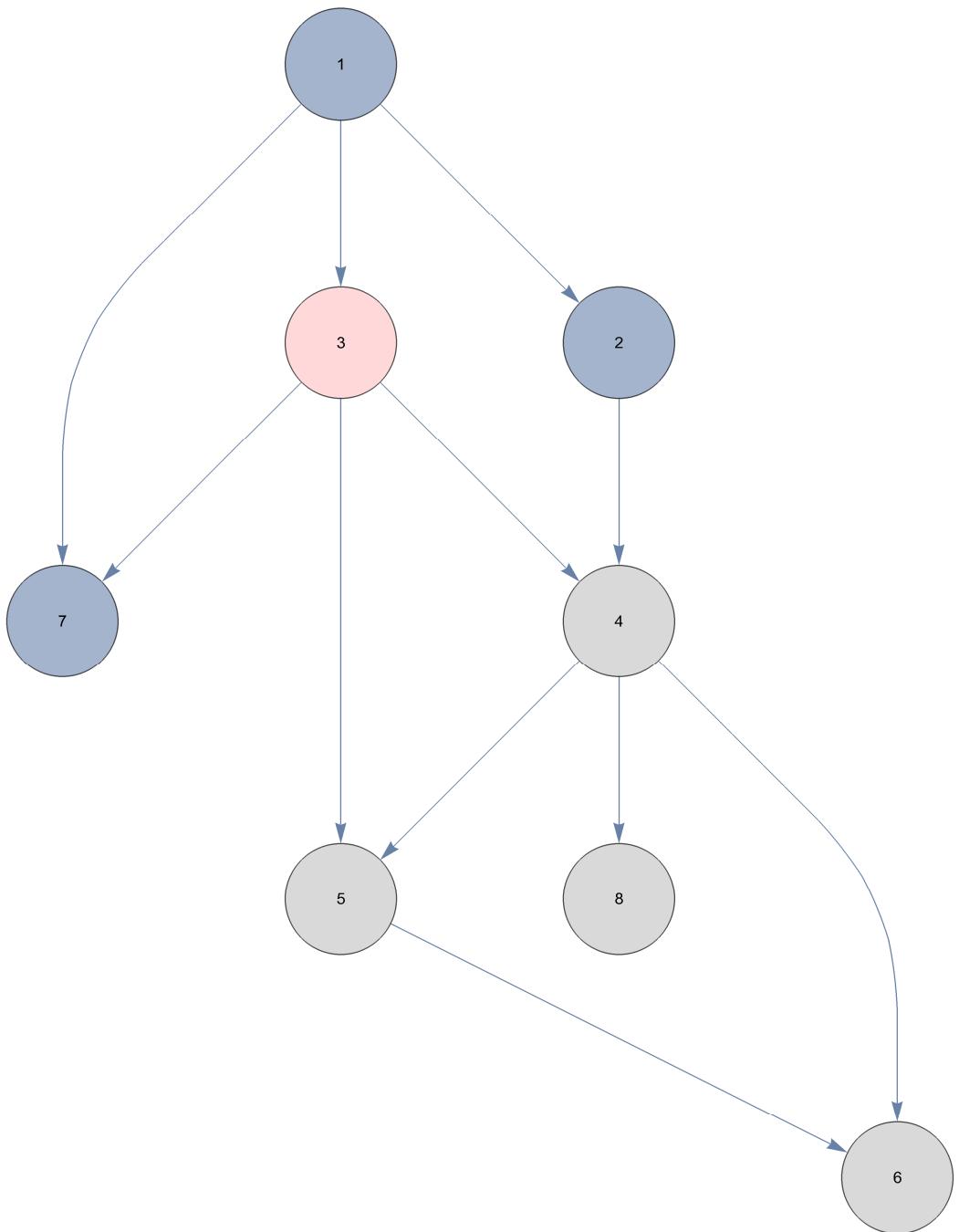


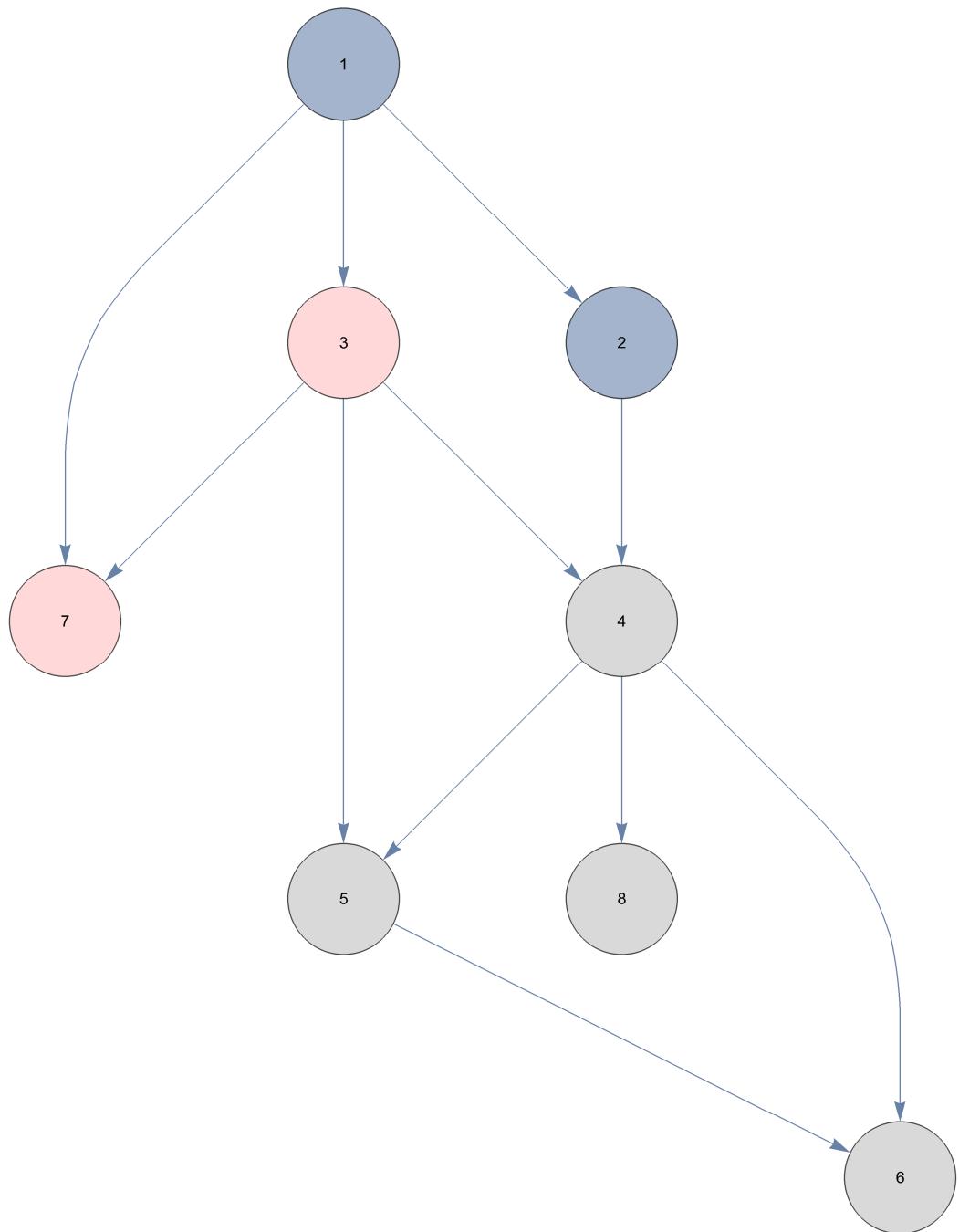


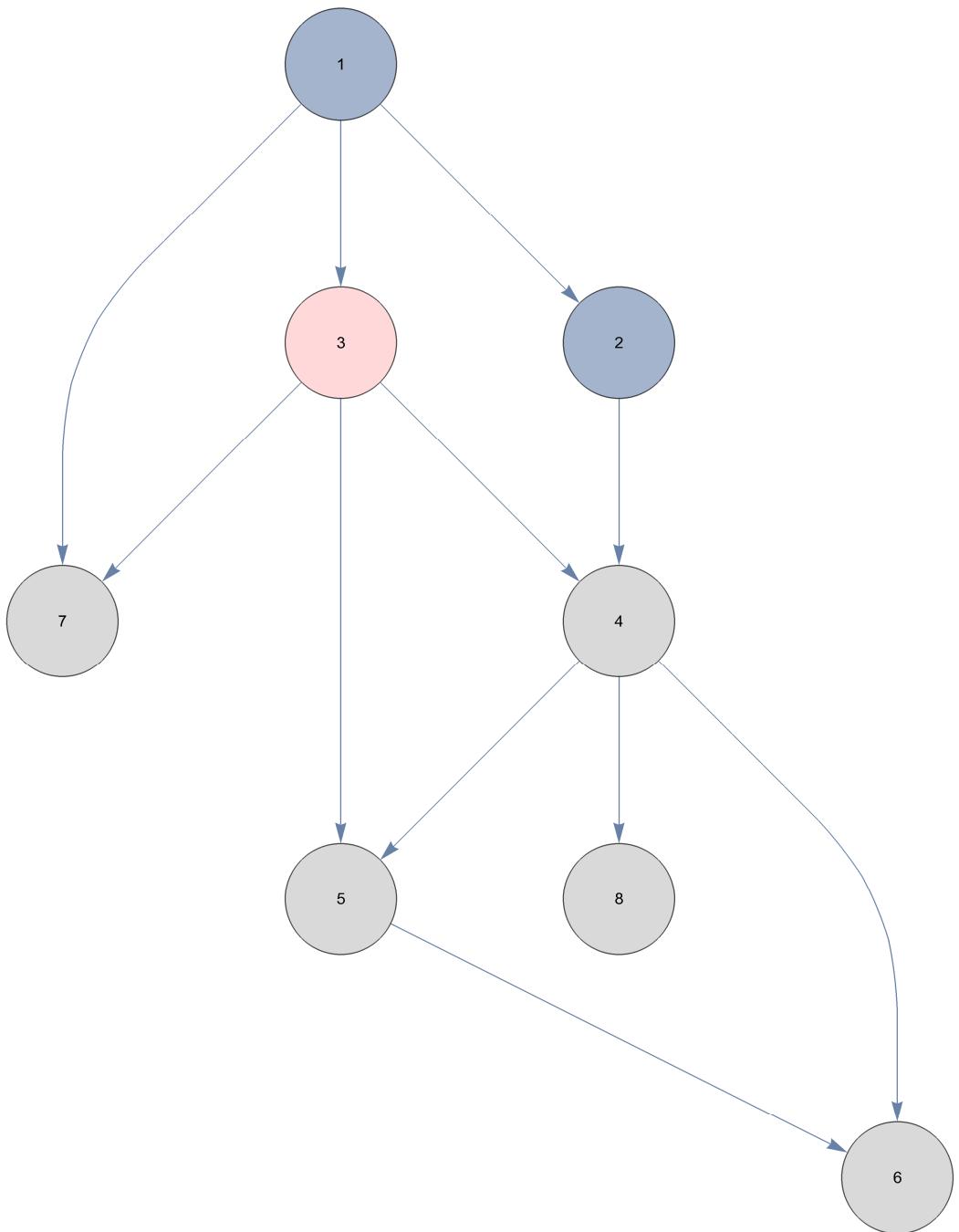


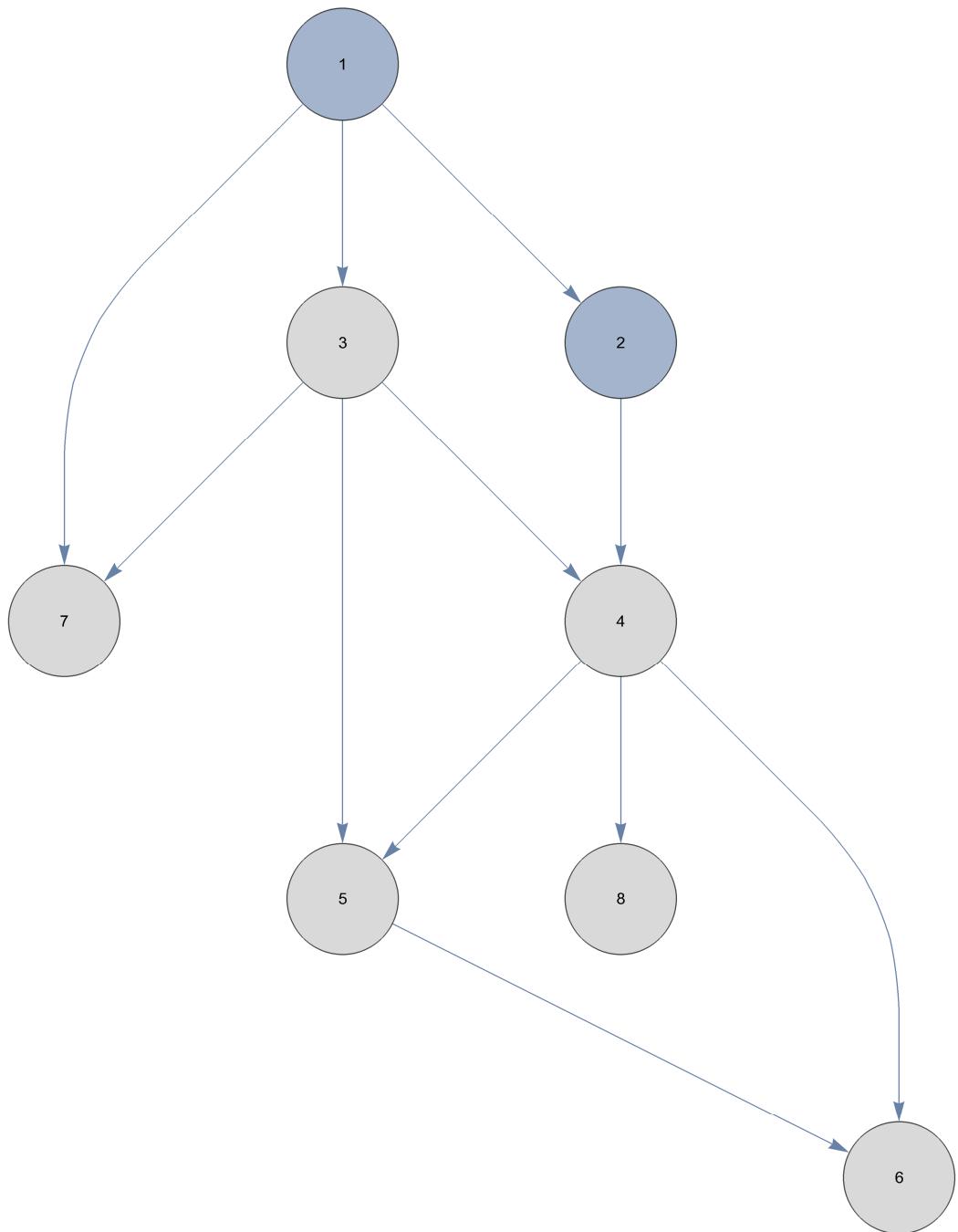


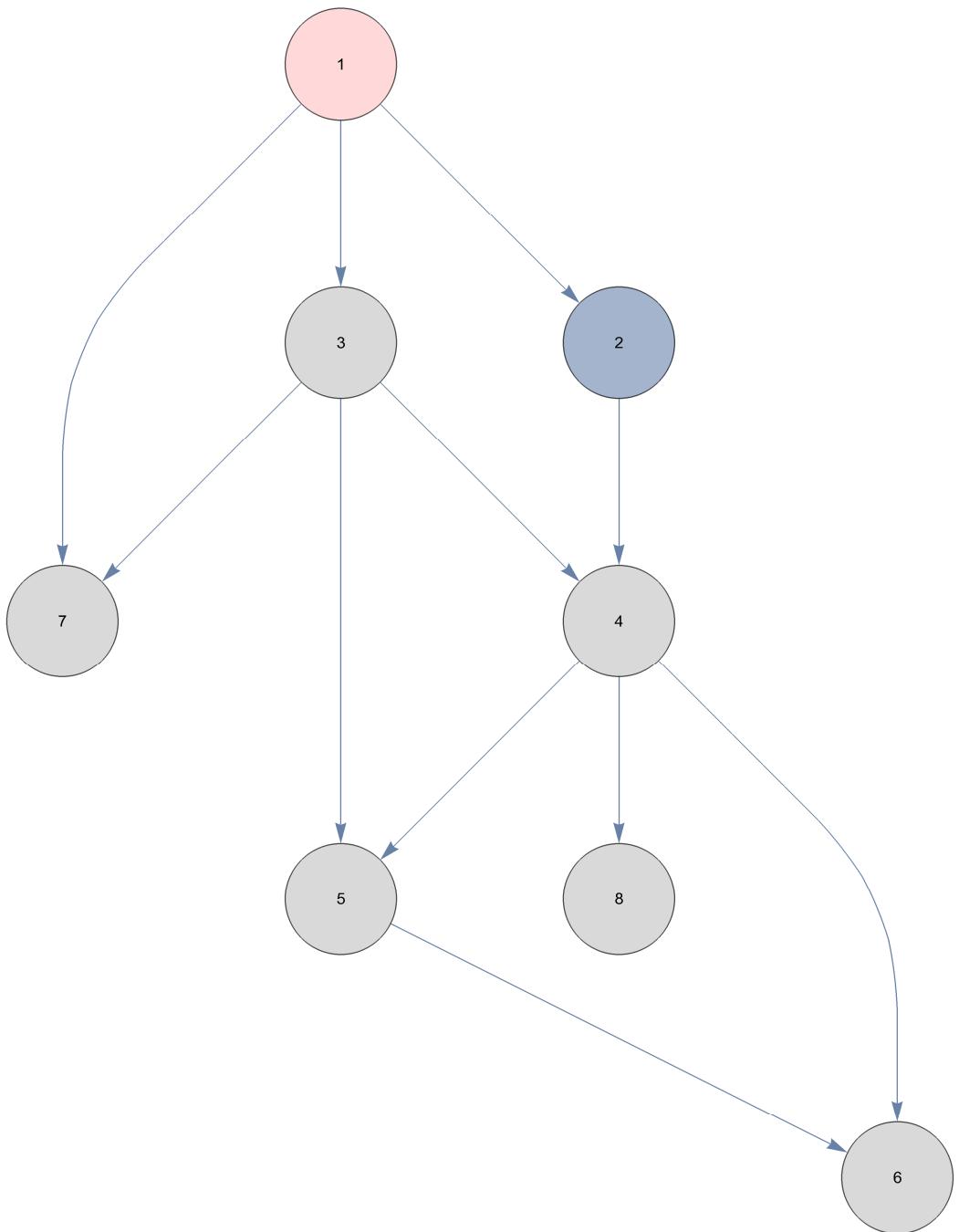


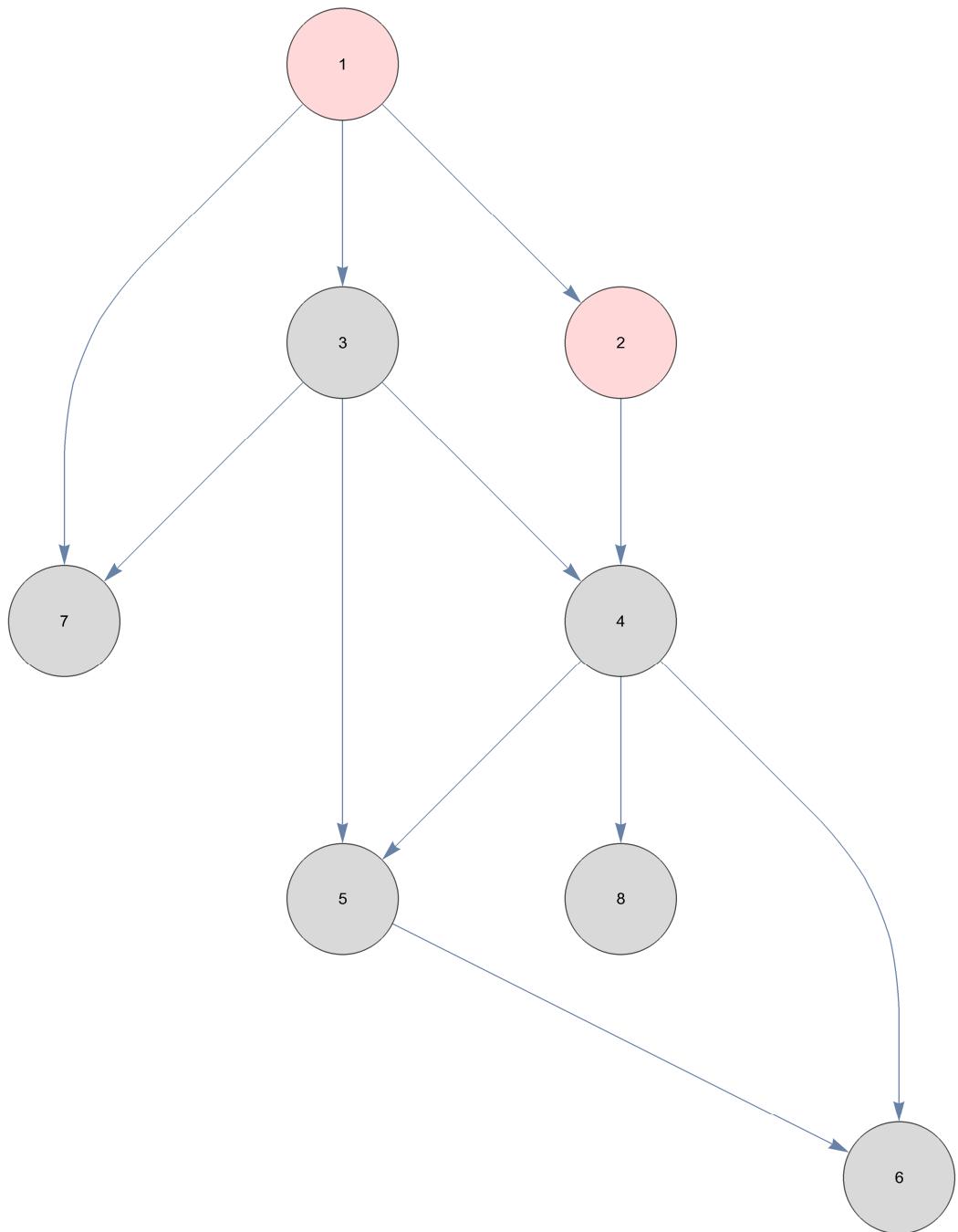


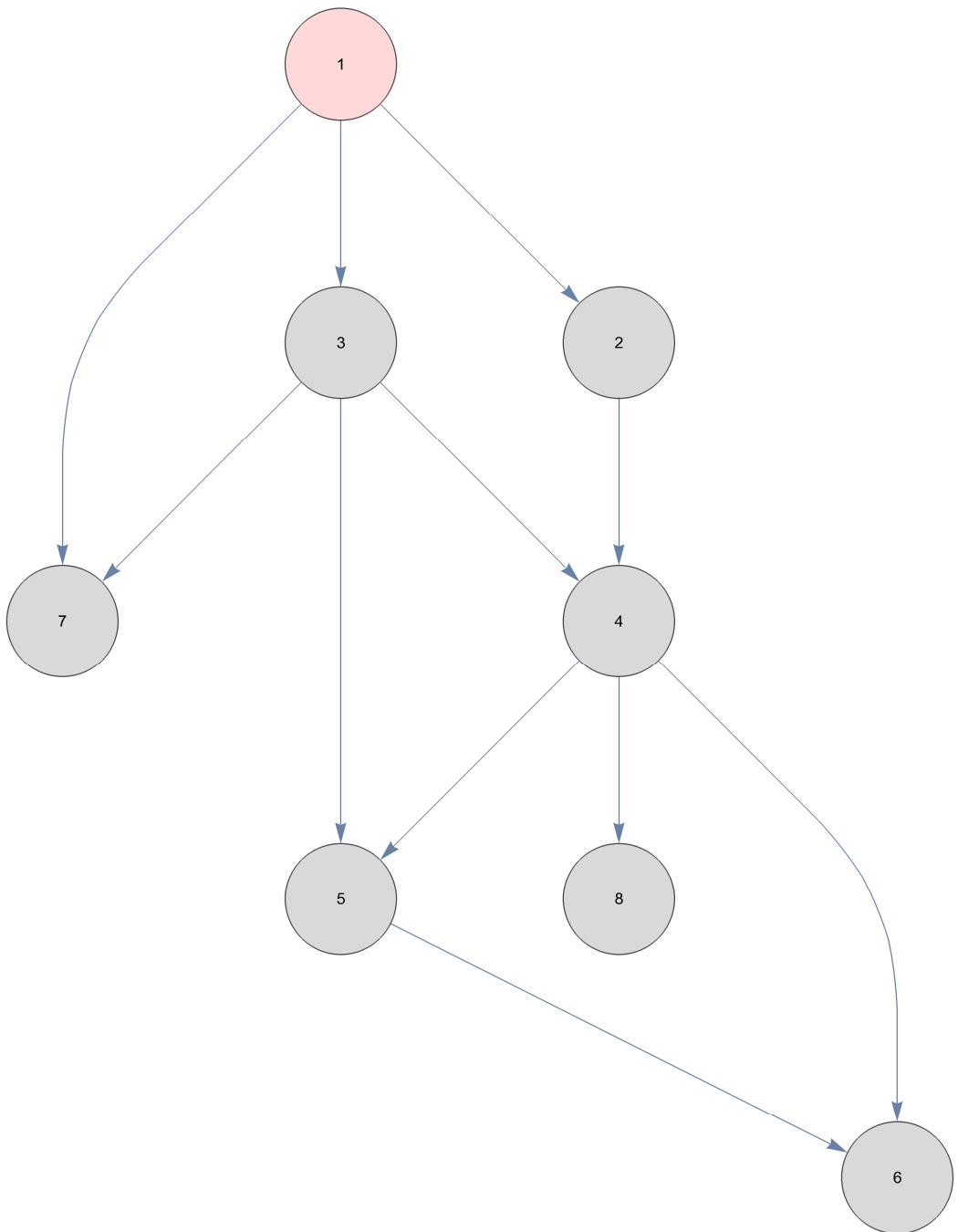


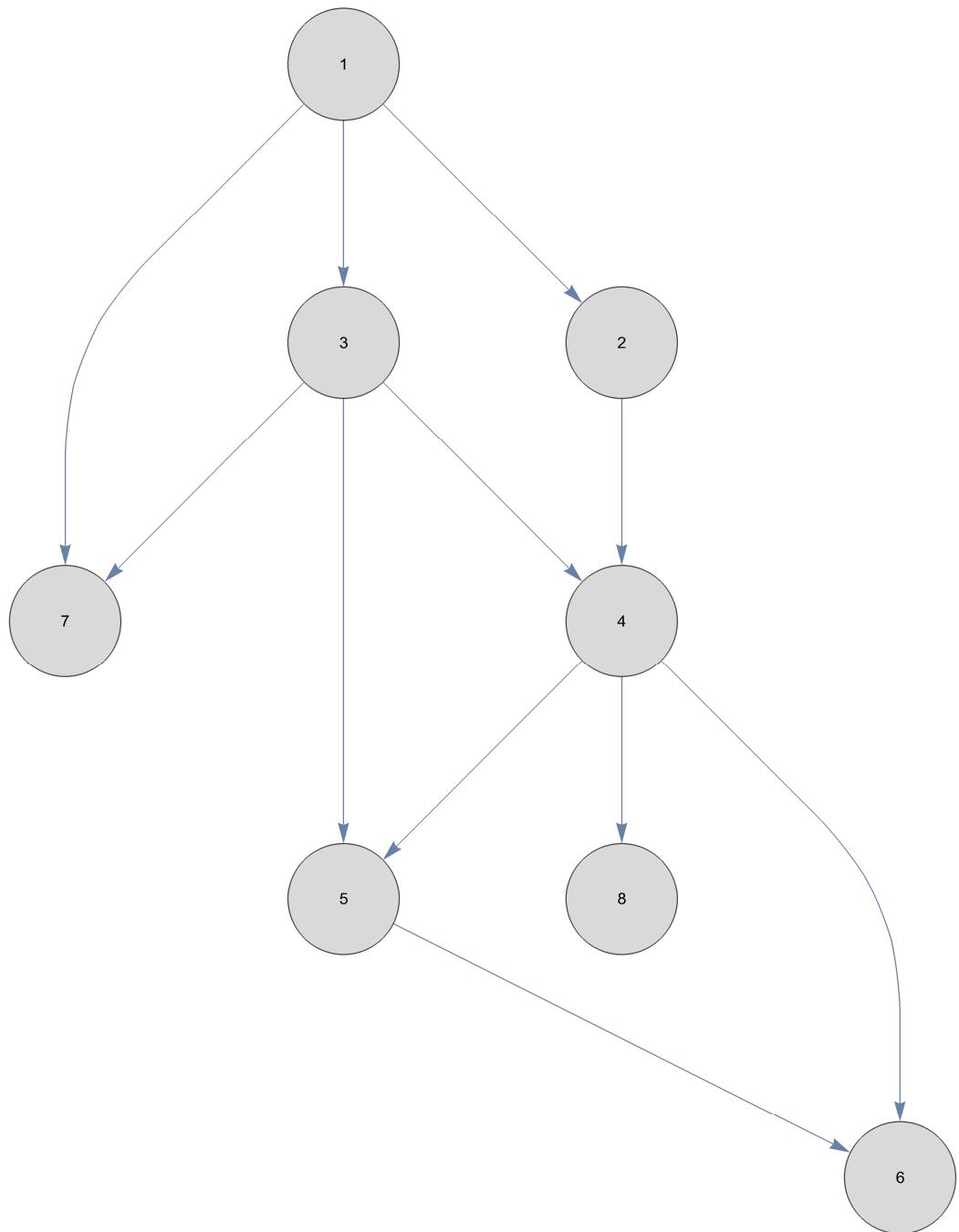








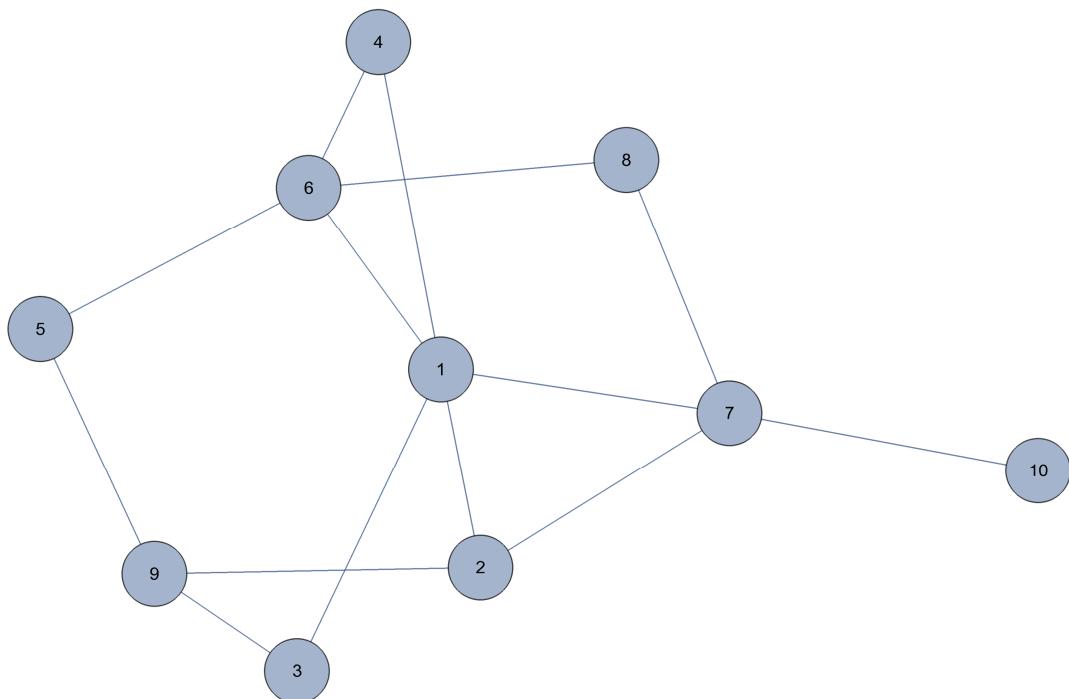


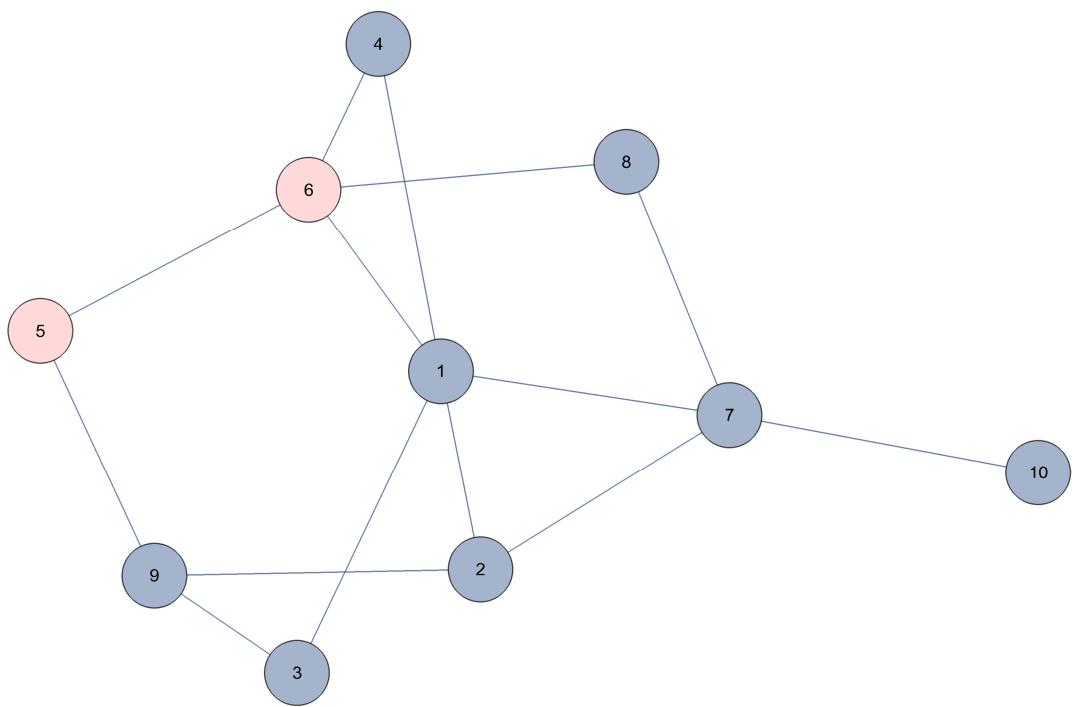
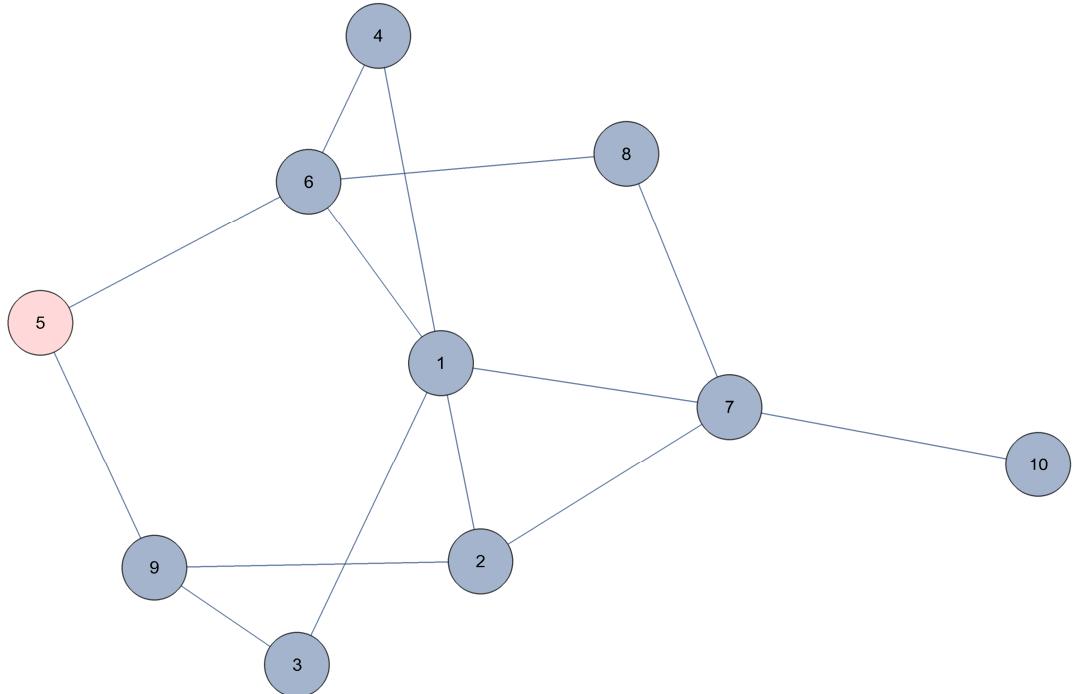


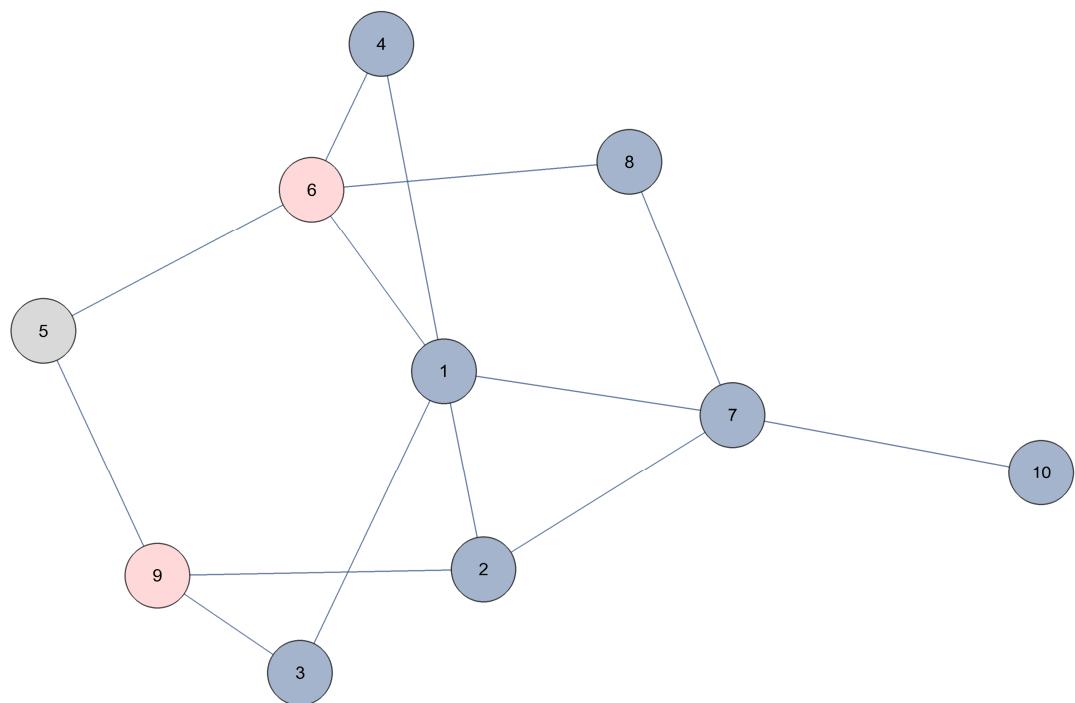
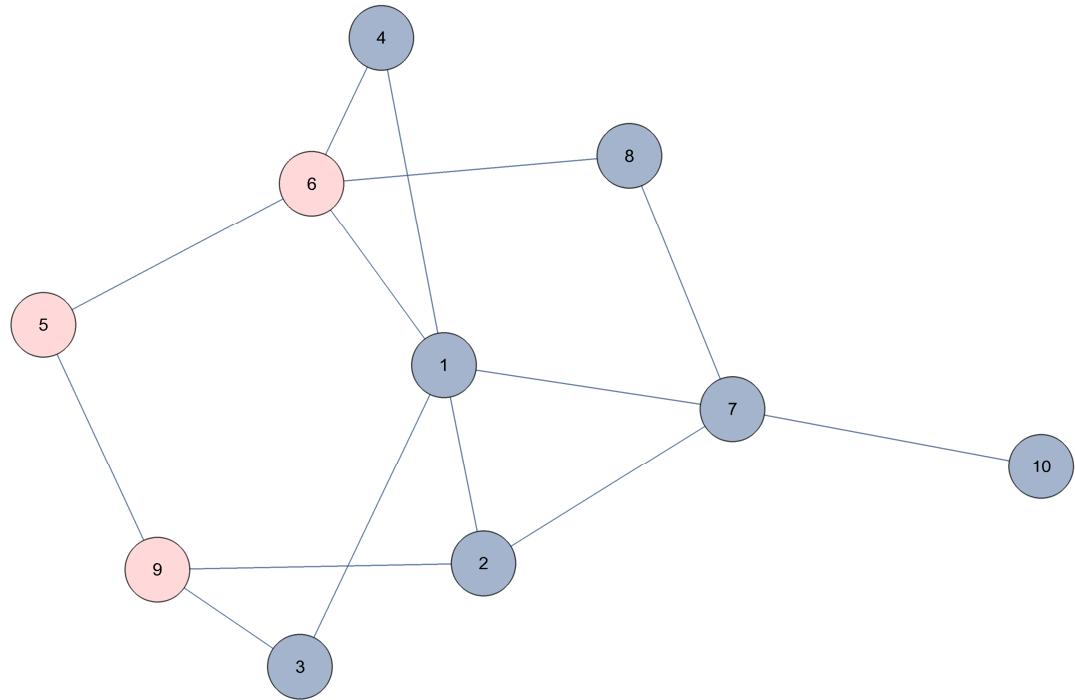
```
In[6]:= Export["toposort.gif", ListAnimate[
Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]}, 
GraphPlot[{{1, 2, 3, 4, 5, 6, 7, 8}, {1 -> 2, 1 -> 3, 1 -> 4, 2 -> 3, 2 -> 5, 3 -> 4, 3 -> 5, 3 -> 6, 4 -> 5, 4 -> 6, 5 -> 6, 6 -> 7, 7 -> 8}, VertexStyle -> #, options] & /@ FoldList[Append, {}, 
Join[visit /@ {4, 5, 6}, visited /@ {6, 5}, visit /@ {8}, visited /@ {8, 4}, 
visit /@ {3, 7}, visited /@ {7, 3}, visit /@ {1, 2}, visited /@ {2, 1}]] 
], ControlPlacement -> Top
]]
Out[6]= toposort.gif
```

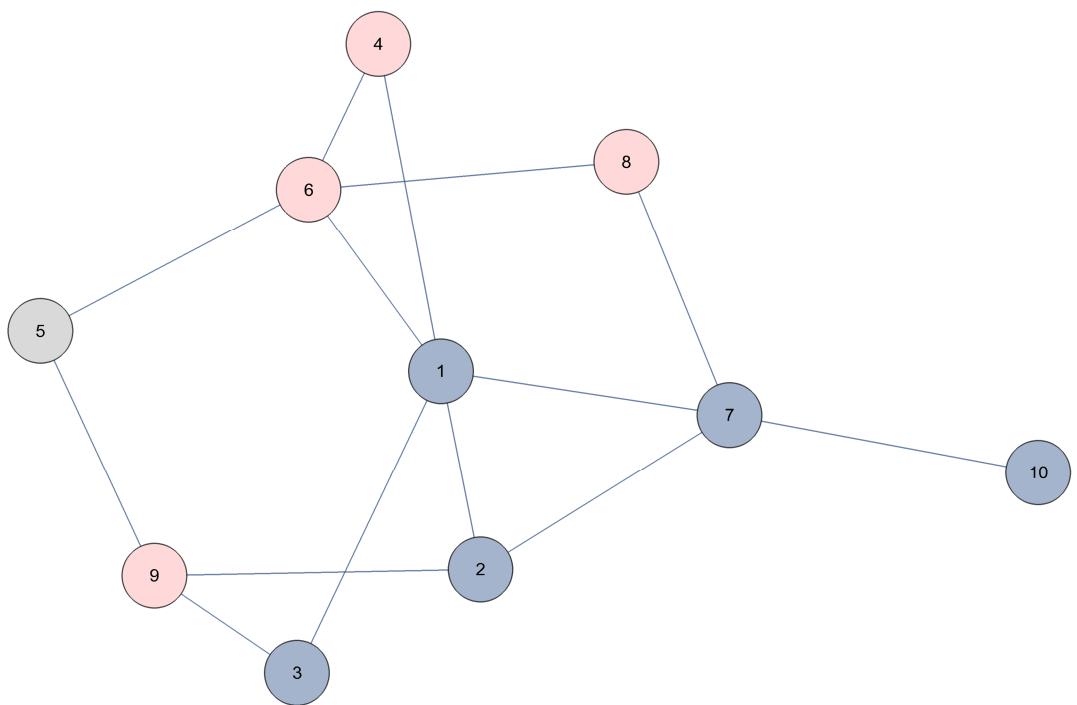
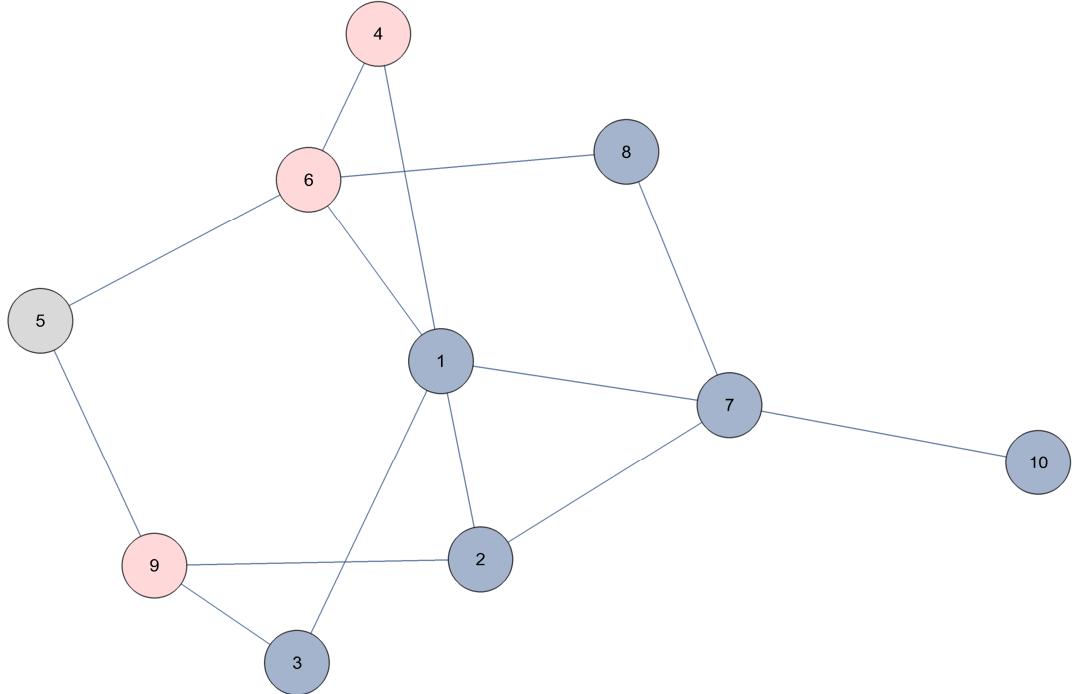
## BFS

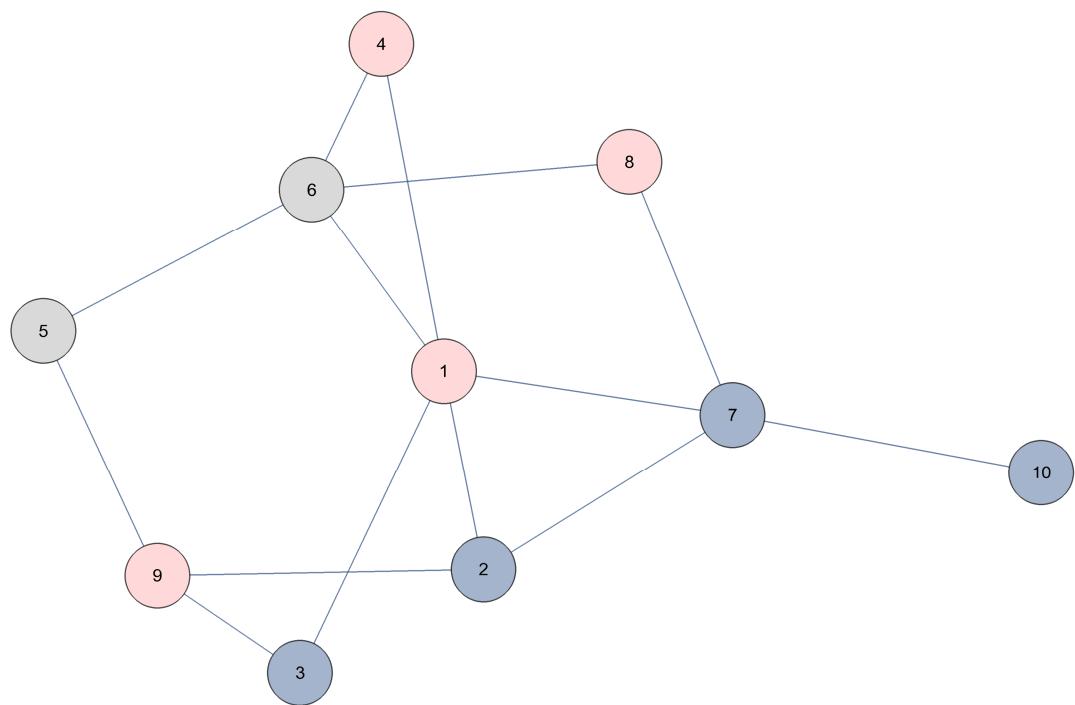
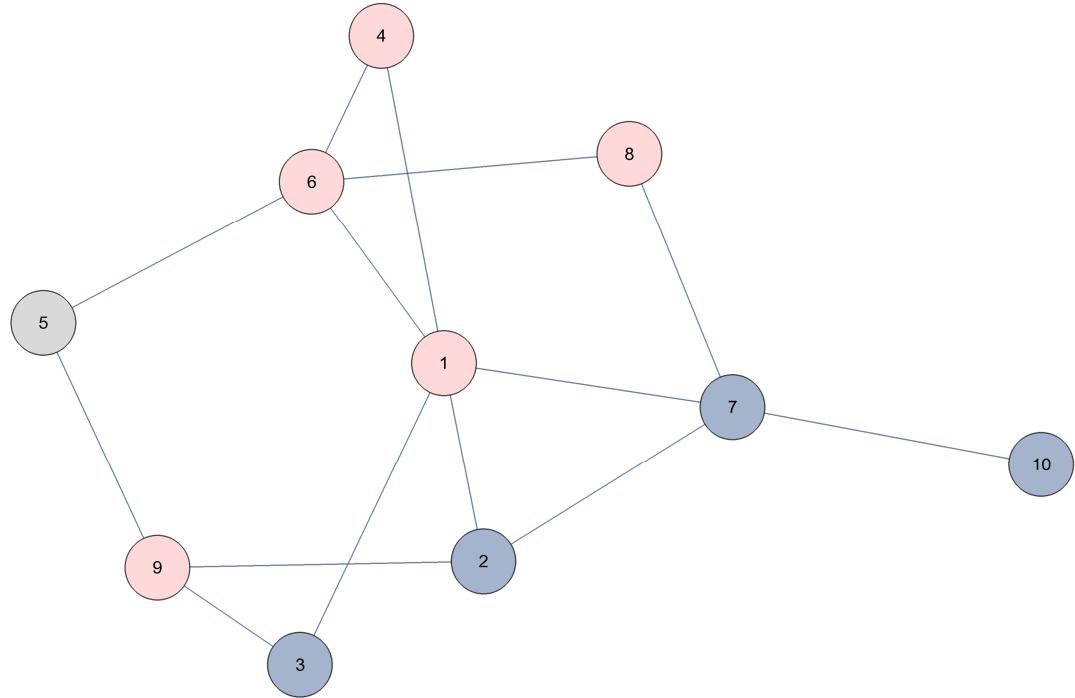
```
In[6]:= Column@Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]}, 
GraphPlot[{{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1 -> 2, 1 -> 3, 1 -> 6, 2 -> 3, 2 -> 5, 3 -> 6, 3 -> 7, 4 -> 6, 4 -> 8, 5 -> 6, 5 -> 9, 6 -> 7, 6 -> 8, 7 -> 10}, VertexStyle -> #, options] & /@ 
FoldList[Append, {}, Join[visit /@ {5, 6, 9}, visited /@ {5}, 
visit /@ {4, 8, 1}, visited /@ {6}, visit /@ {2, 3}, visited /@ {9, 4}, 
visit /@ {7}, visited /@ {8, 1, 2, 3}, visit /@ {10}, visited /@ {7, 10}]] 
]
```

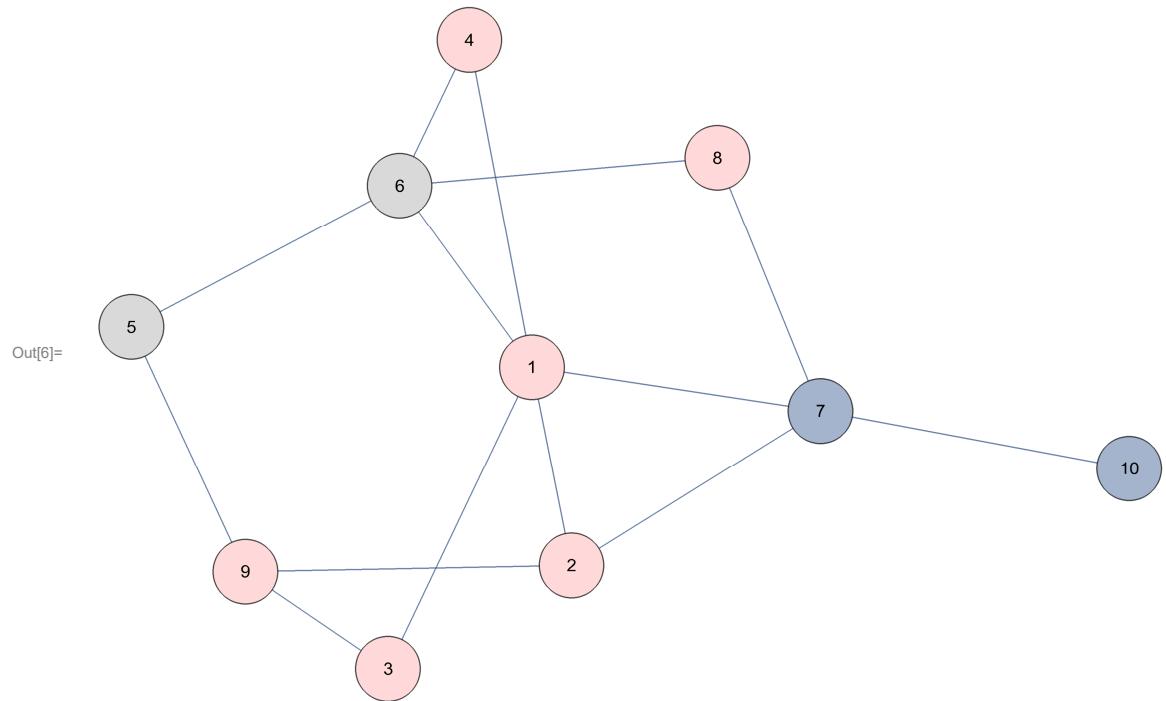
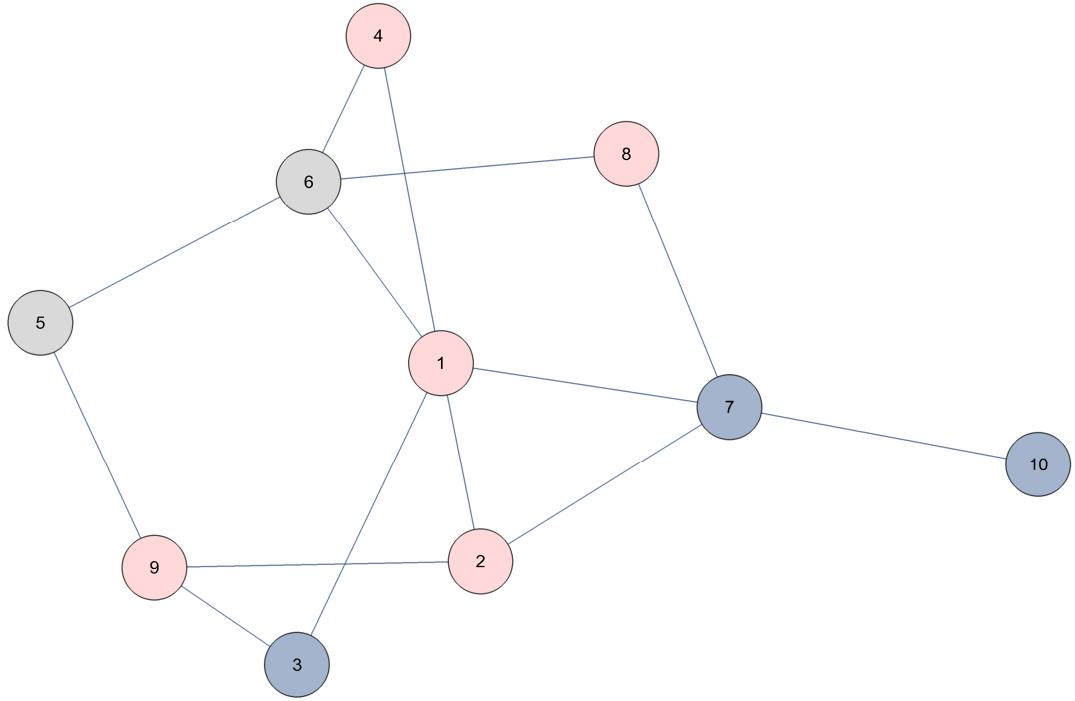


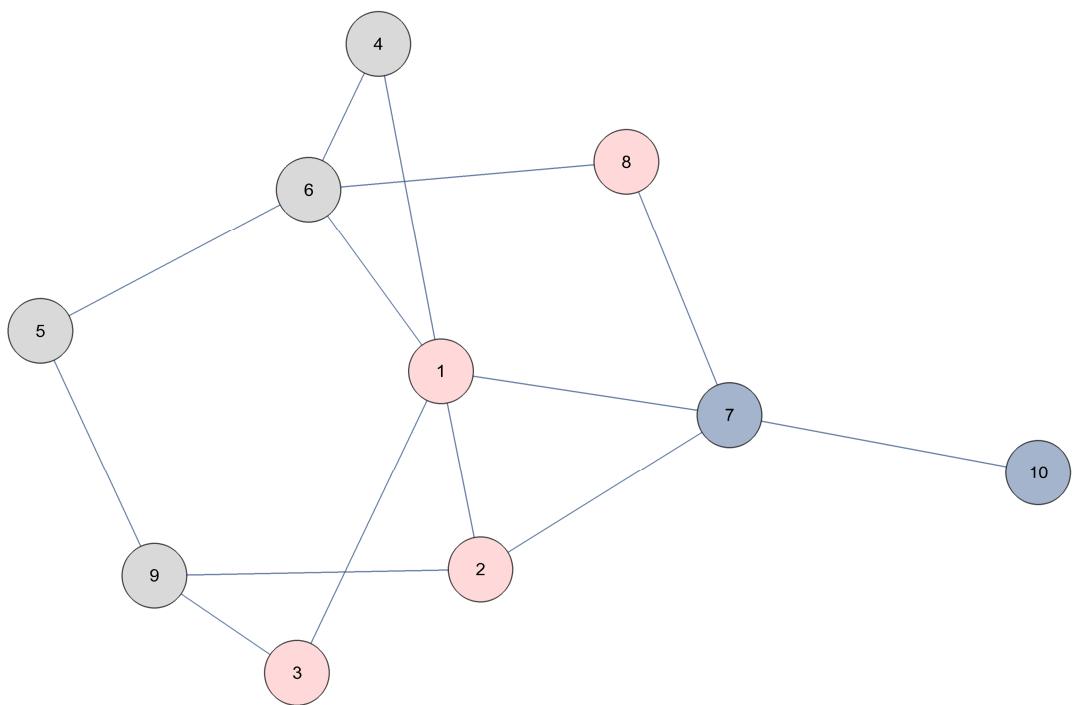
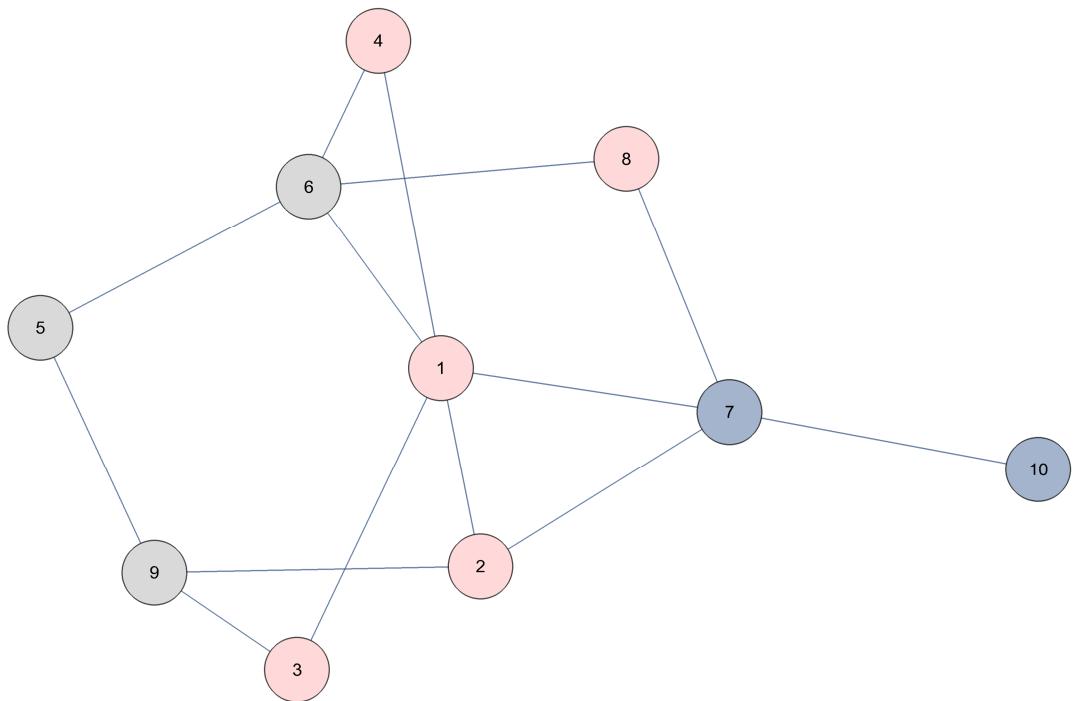


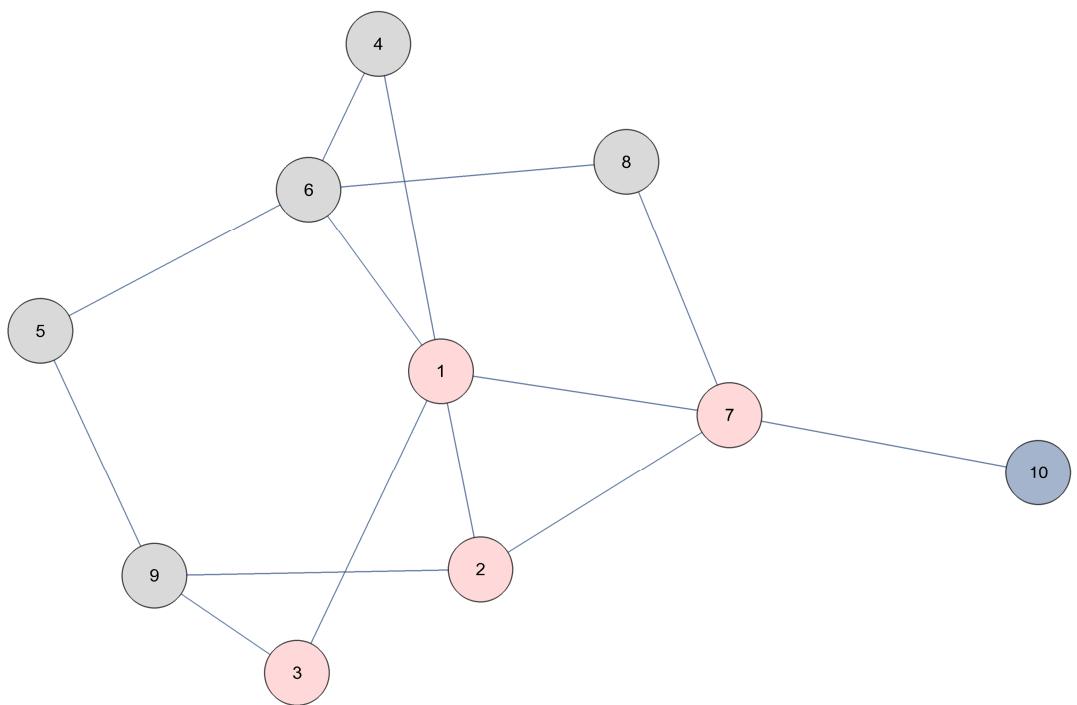
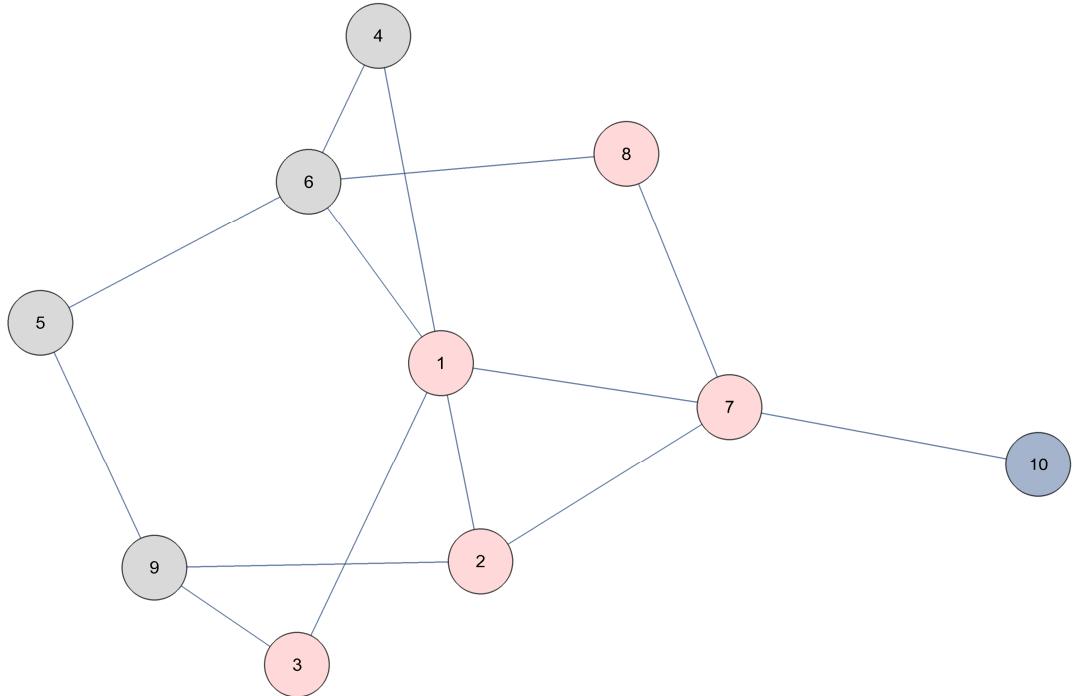


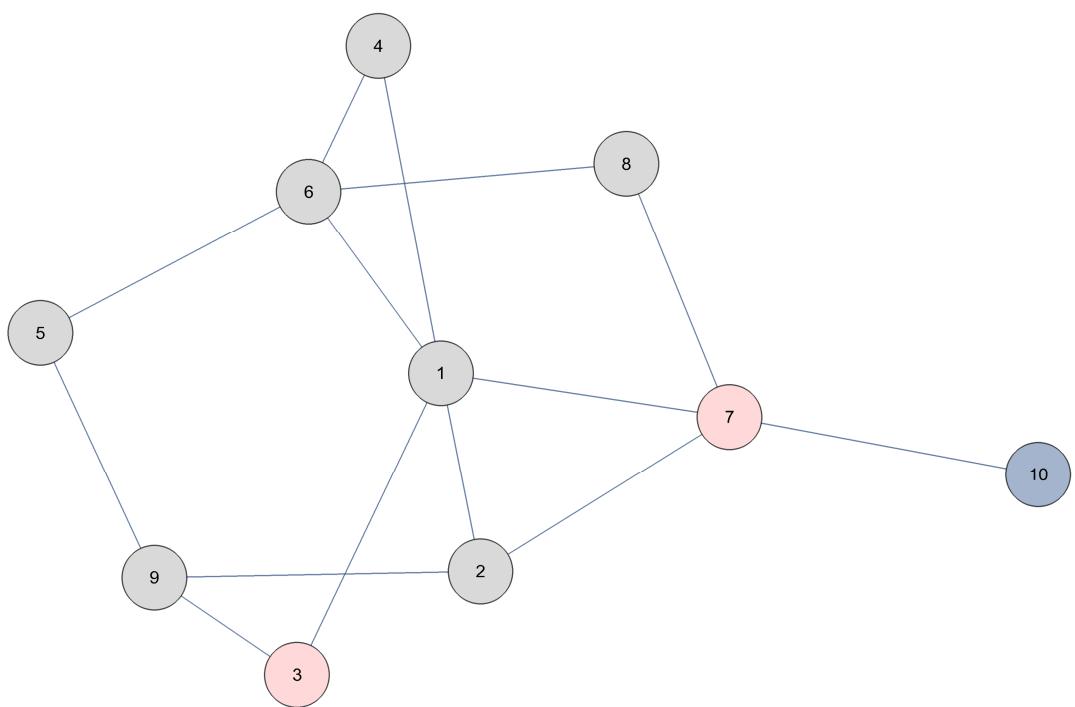
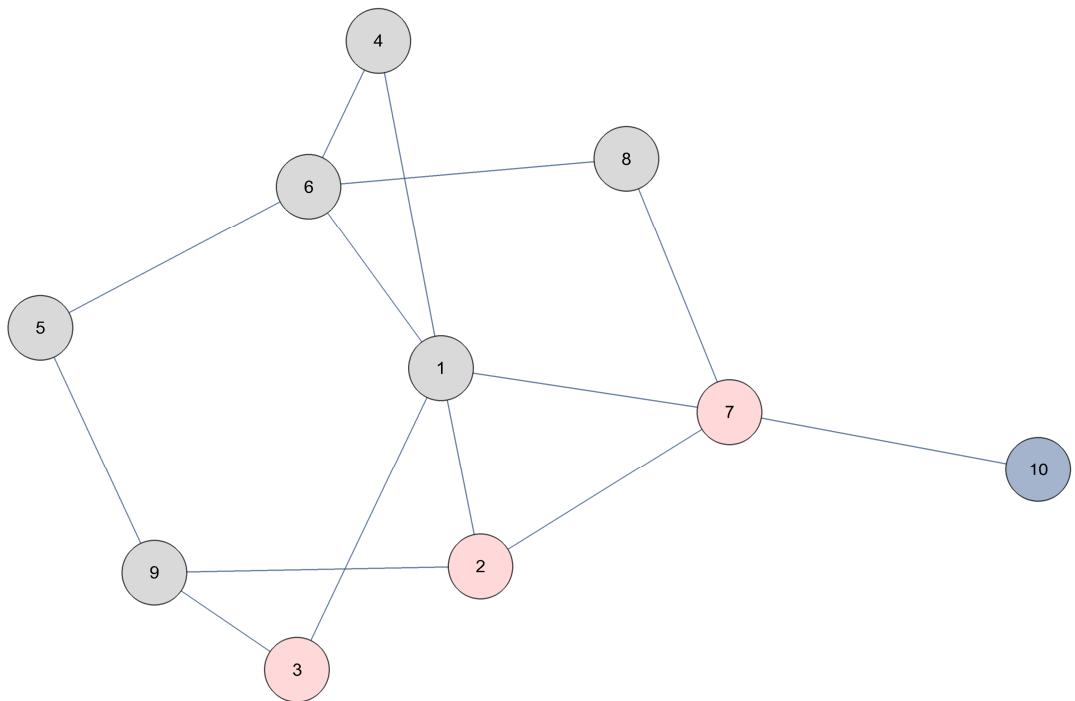


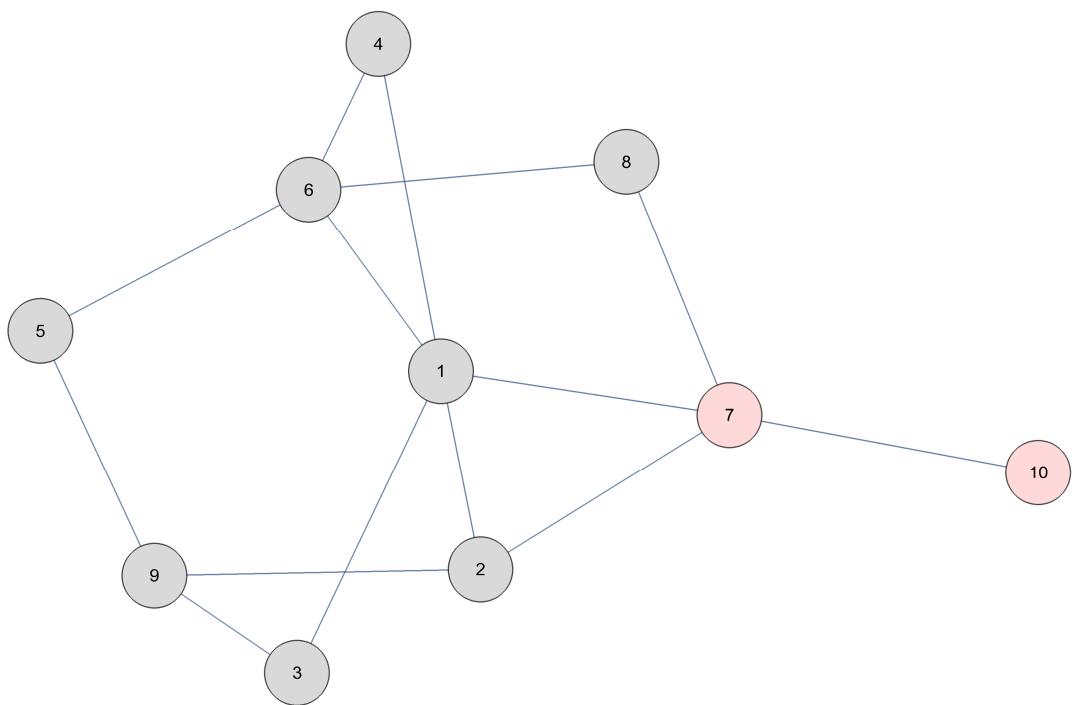
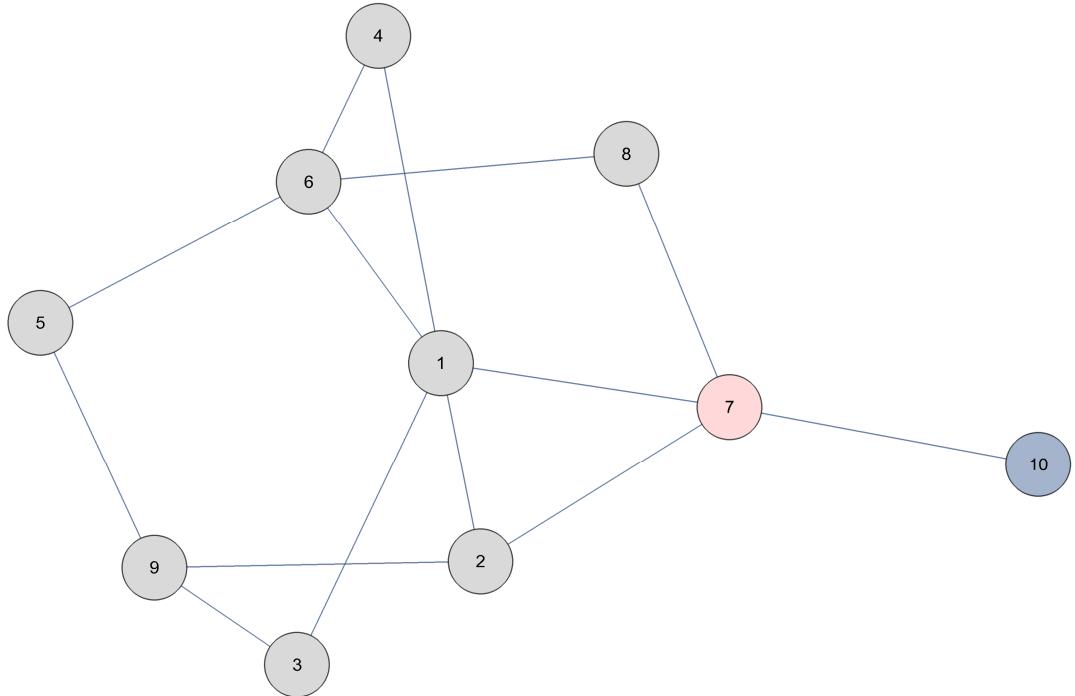


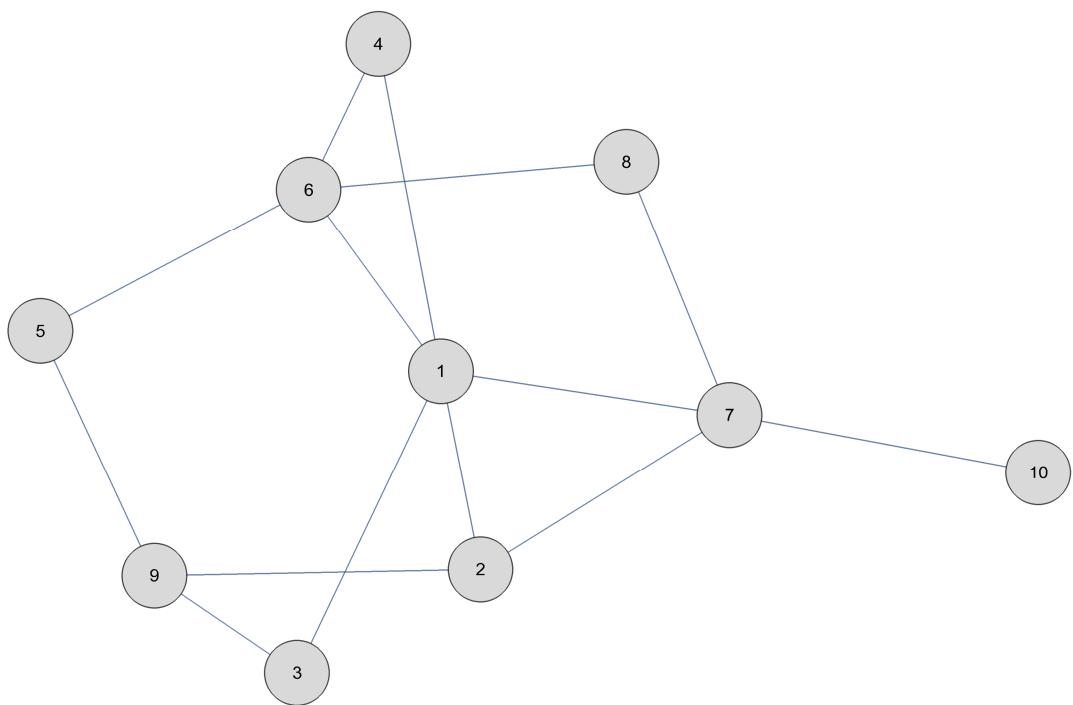
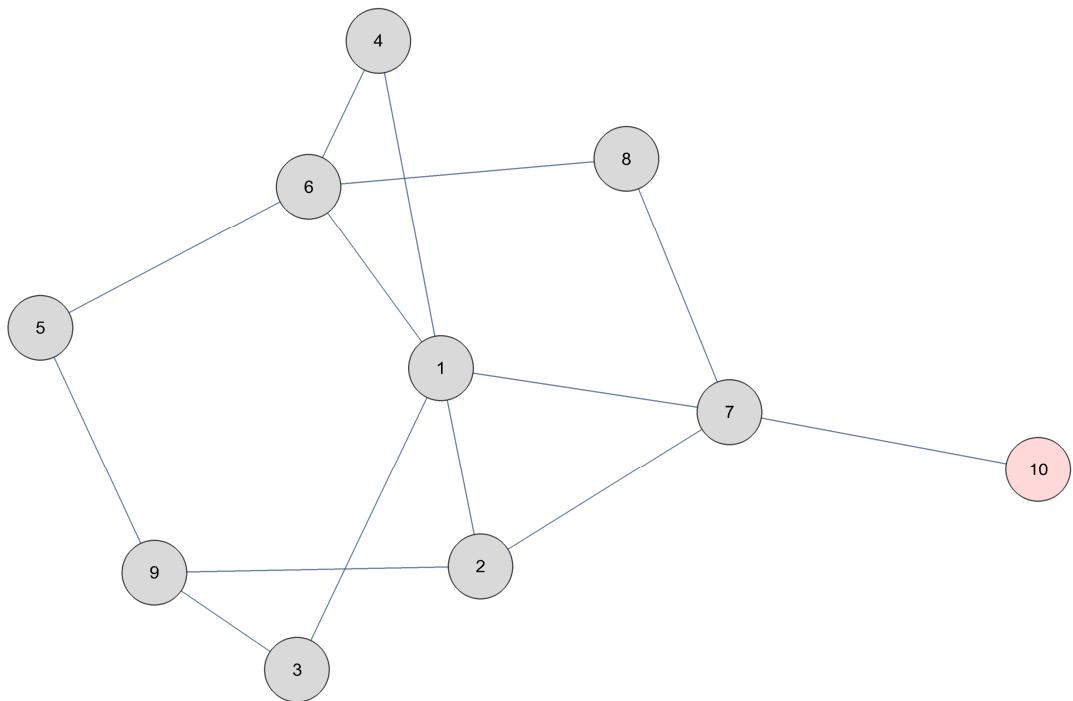












```
In[®]:= Export["bfs.gif", ListAnimate[  
  Module[{visit = Function[# -> LightRed], visited = Function[# -> LightGray]},  
   GraphPlot[{{5, 6}, {6, 8}, {5, 9}, {9, 3}, {3, 2}, {2, 7}, {7, 10}}, VertexStyle -> #, options] & /@  
   FoldList[Append, {}, Join[visit /@ {5, 6, 9}, visited /@ {5},  
    visit /@ {4, 8, 1}, visited /@ {6}, visit /@ {2, 3}, visited /@ {9, 4},  
    visit /@ {7}, visited /@ {8, 1, 2, 3}, visit /@ {10}, visited /@ {7, 10}]]  
, ControlPlacement -> Top  
]]]  
  
Out[®]= bfs.gif
```