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## Exploring networks using networkx package

### Importing

```
In [4]: import networkx as nx
```

```
In [5]: G = nx.Graph()
```

```
In [6]: print(G.nodes()) # returns a list  
print(G.edges())
```

```
[]  
[]
```

```
In [8]: G.add_node("A")
```

```
In [9]: G.add_nodes_from(["B", "C", "D", "E"])
```

```
In [10]: G.add_edge(*("A", "B"))
```

```
In [11]: G.add_edges_from [("A", "C"), ("B", "D"), ("B", "E"), ("C", "E")]
```

### Accessing vertex and edge sets

```
In [12]: print("Vertex set: ", G.nodes())
```

```
Vertex set:  ['A', 'B', 'C', 'D', 'E']
```

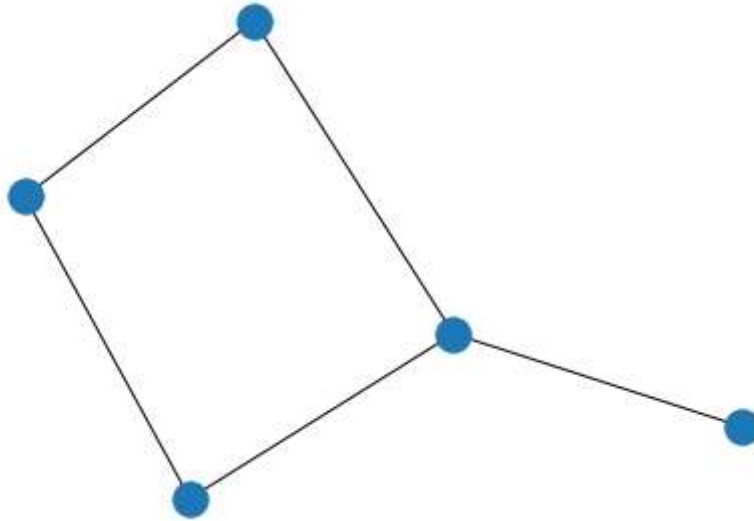
```
In [13]: print("Edge set: ", G.edges())
```

```
Edge set:  [('A', 'B'), ('A', 'C'), ('B', 'D'), ('B', 'E'), ('C', 'E')]
```

### Drawing graph

```
In [14]: import matplotlib.pyplot as plt
```

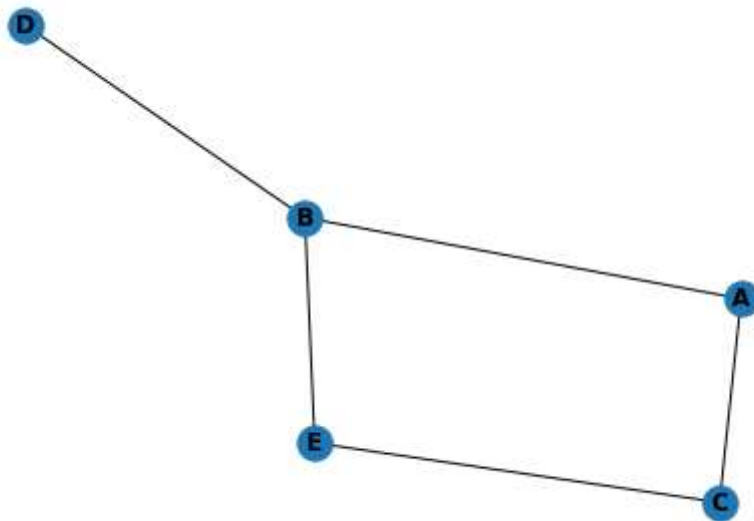
```
In [15]: nx.draw(G)  
plt.show()
```



```
In [18]: plt.savefig("graph.png")
```

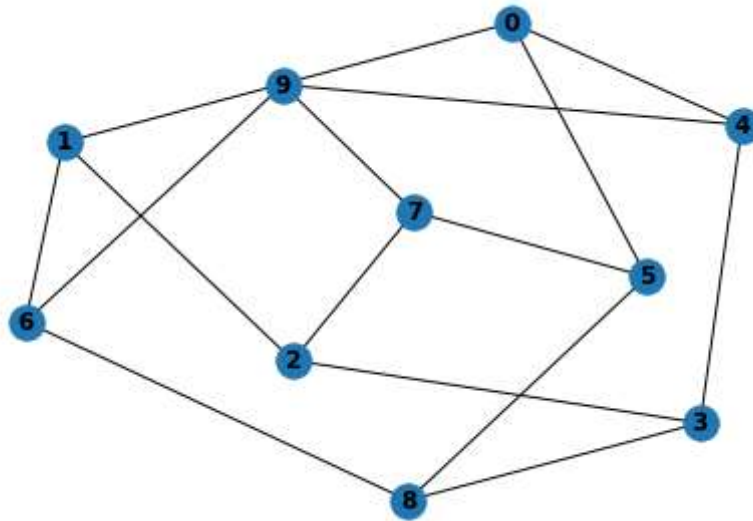
<Figure size 432x288 with 0 Axes>

```
In [20]: nx.draw(G, with_labels=True, font_weight='bold')  
plt.show()
```



```
In [21]: GP = nx.petersen_graph()
```

```
In [23]: nx.draw(GP, with_labels=True, font_weight='bold')
plt.show()
```



### Adjacency view

```
In [24]: print(G.adj)
```

```
{'A': {'B': {}, 'C': {}}, 'B': {'A': {}, 'D': {}, 'E': {}}, 'C': {'A': {},
'E': {}}, 'D': {'B': {}}, 'E': {'B': {}, 'C': {}}}
```

### Degree of a vertex

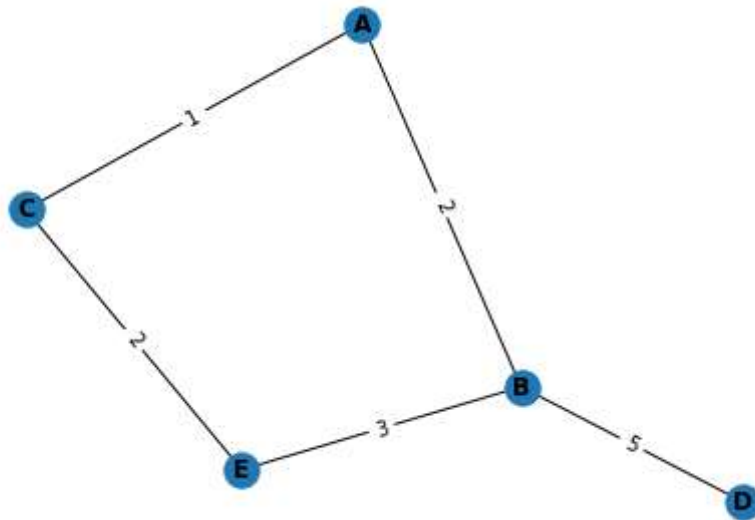
```
In [25]: G.degree("A")
```

```
Out[25]: 2
```

### Creating weighted graph

```
In [27]: G = nx.Graph()
E = [('A', 'B', 2), ('A', 'C', 1), ('B', 'D', 5), ('B', 'E', 3), ('C', 'E', 2)]
G.add_weighted_edges_from(E)
```

```
In [29]: pos=nx.spring_layout(G)
nx.draw(G, pos, with_labels=True, font_weight='bold')
edge_weight = nx.get_edge_attributes(G, 'weight')
nx.draw_networkx_edge_labels(G, pos, edge_labels = edge_weight)
plt.show()
```



In [ ]: