

# ***Time Management I***

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**<http://lbgeeks.com/gitc/pmTime.php>**

**June 4, 2008**

- **What is Time Management?**
- **Activities, Resources, and Estimates**
- **Time Mathematics**
- **Summary**

# ***What is Time Management?***

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- **Order work to achieve more throughput: reduce cost; increase output and quality**
- **Predict time needed at micro (activity) and macro (project) levels**
- **Carnot's second law of thermodynamics:**
  - **Entropy of a system not in equilibrium will increase over time**
  - **Maximum entropy at equilibrium**
- **Process theory:**
  - **Entry criteria describes a sequence**
  - **Exit criteria describes a prerequisite**

- **Process vs. activity vs. task:**
  - **Process contains inputs, activities, outputs**
  - **Activity contains multiple tasks**
- **Activities model work being performed**
- **Consume inputs and create outputs**
- **Run serially or in parallel**
- **May have dependencies or sequences**

- **Another name for inputs**
- **Consumable: quantity available to project decreases over time**
- **Bounded: duty cycle limited, not available at all times**
- **Can we have unbounded, non-consumable resources?**
- **Cost may or may not impact project**

# *Estimates – 1 of 2*

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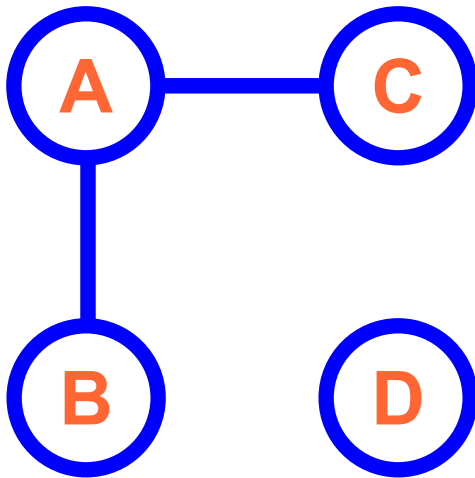
- **Compute expected resource consumption rate**
- **Money: equipment, labor, material costs**
- **Time: start, duration, stop**
- **Opportunity: what work must be ignored or stopped while project in progress**

- **WAG**
  - Expert opinion
  - Subjective guess when not available
- **Mathematical calculation**
  - Perform a simulation
  - Multiple executions with random data
- **Previous experience**
  - Correlate new with previous project
  - Extrapolate actual consumption
- **Combination of above**

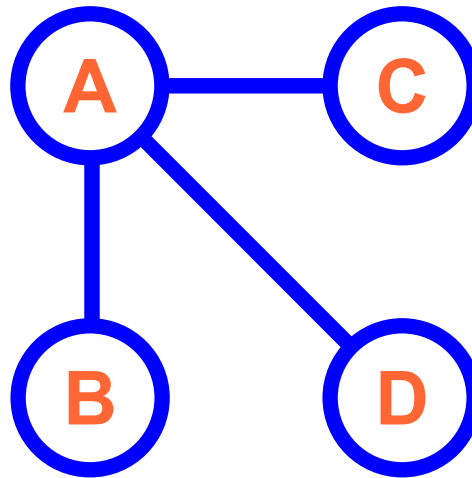
- **Graph Theory**
- **Graph Types:**
  - **Disconnected, Connected, Fully Connected**
  - **Undirected, Directed**
  - **Weighted, Flow**
- **Completion Time Graph**
- **Slack Time Graph**

- **Set of vertices and edges:**  
 $G = \{ V, E \}$
- **Vertices are an abstract concept:**
  - **Cities**
  - **Numbers**
  - **Network nodes**
- **Edges are pairs:**  
 $E = \{ ( v, w ) \mid v, w \in V \}$

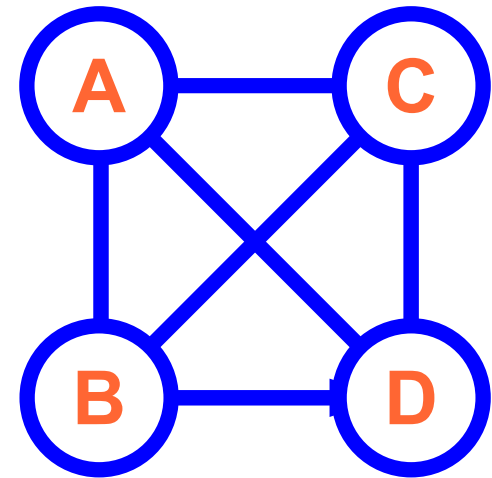
# Disconnected, Connected Graphs



**Disconnected**

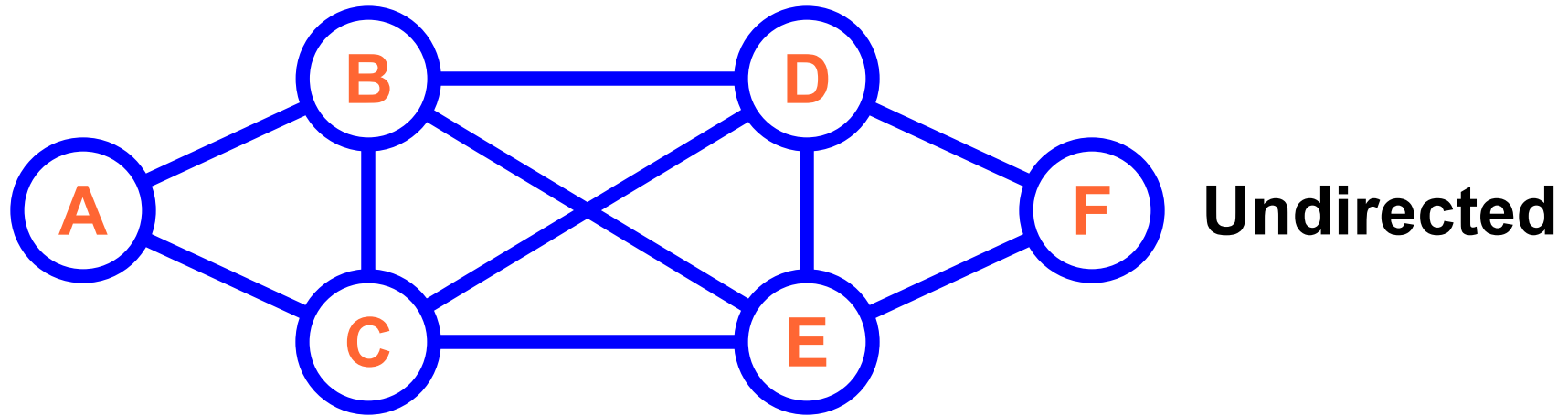


**Connected**



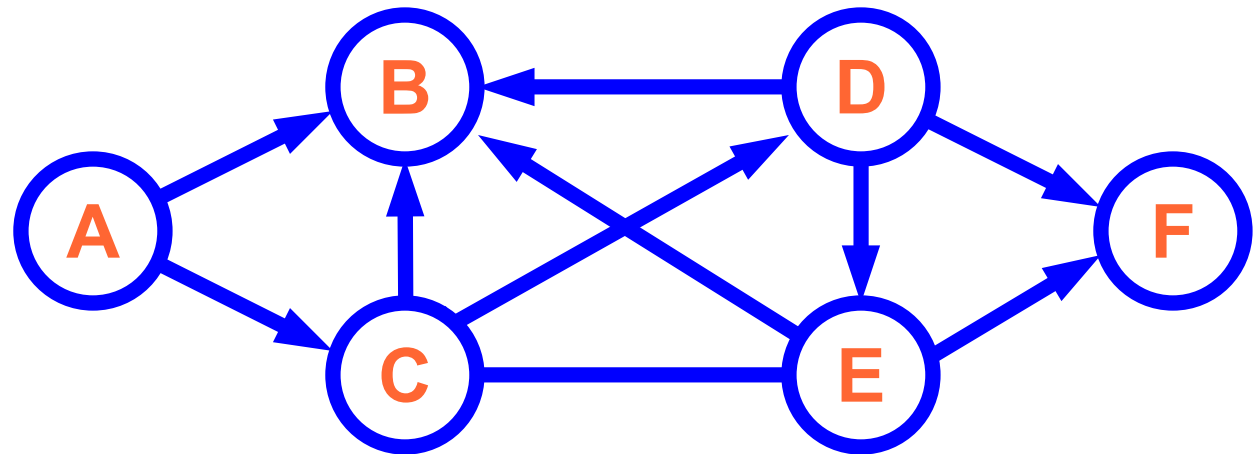
**Fully  
Connected**

# Undirected, Directed Graphs

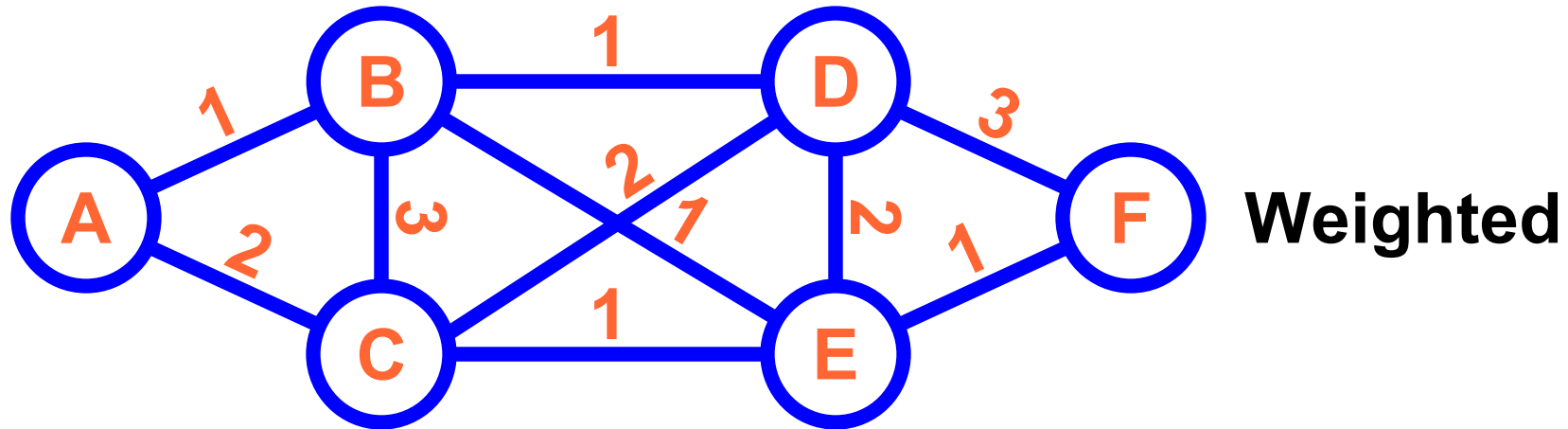


**Directed:**

- Source
- Sink
- Cycle

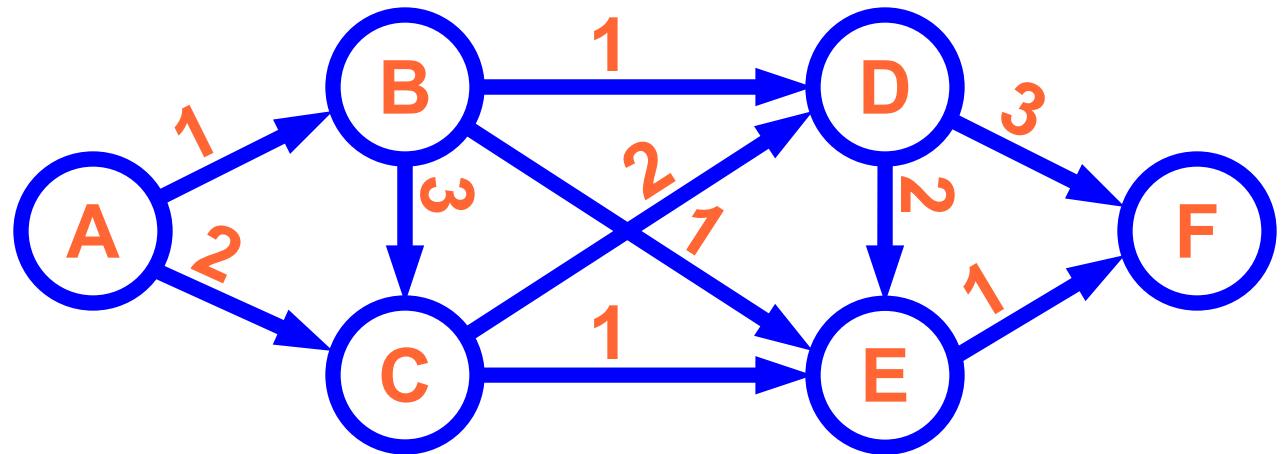


# Weighted, Flow Graphs

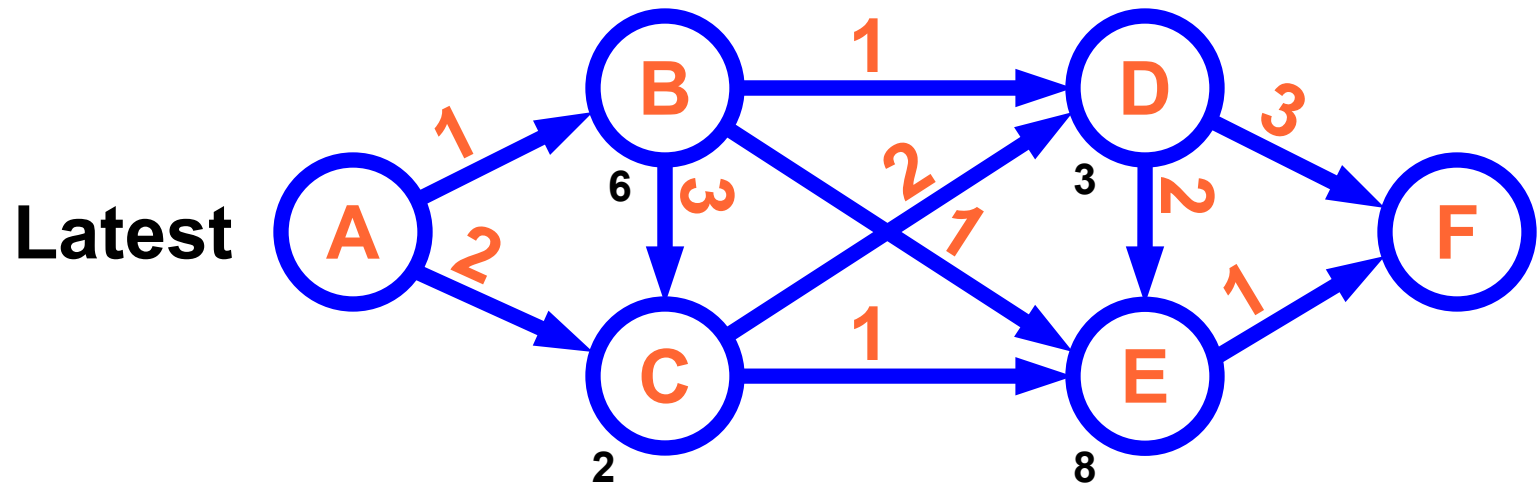
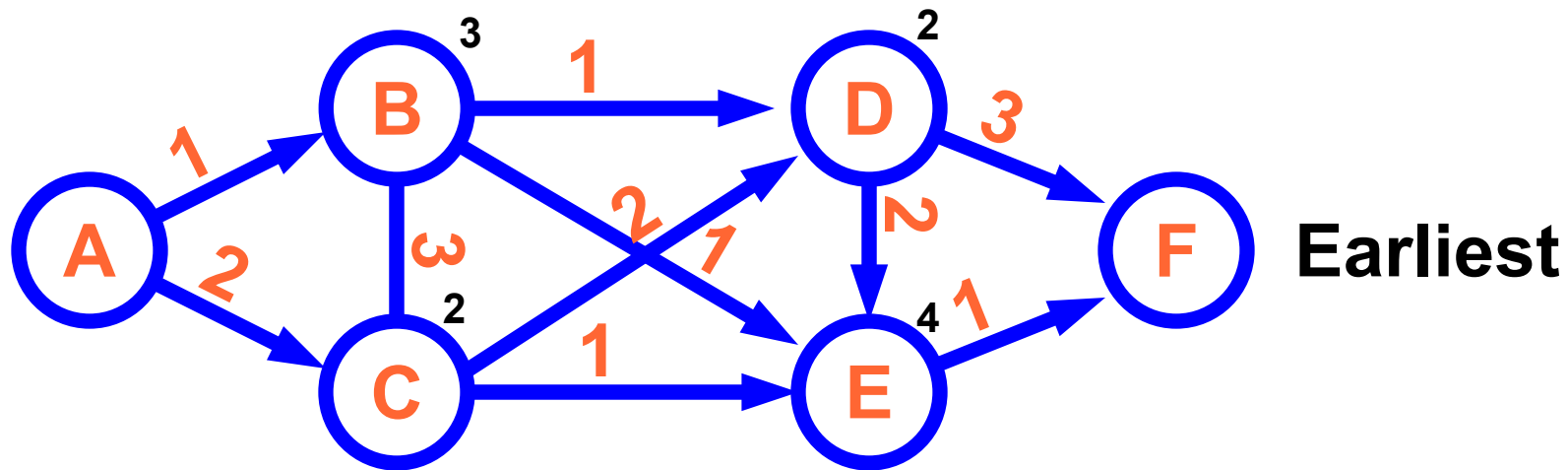


**Flow:**

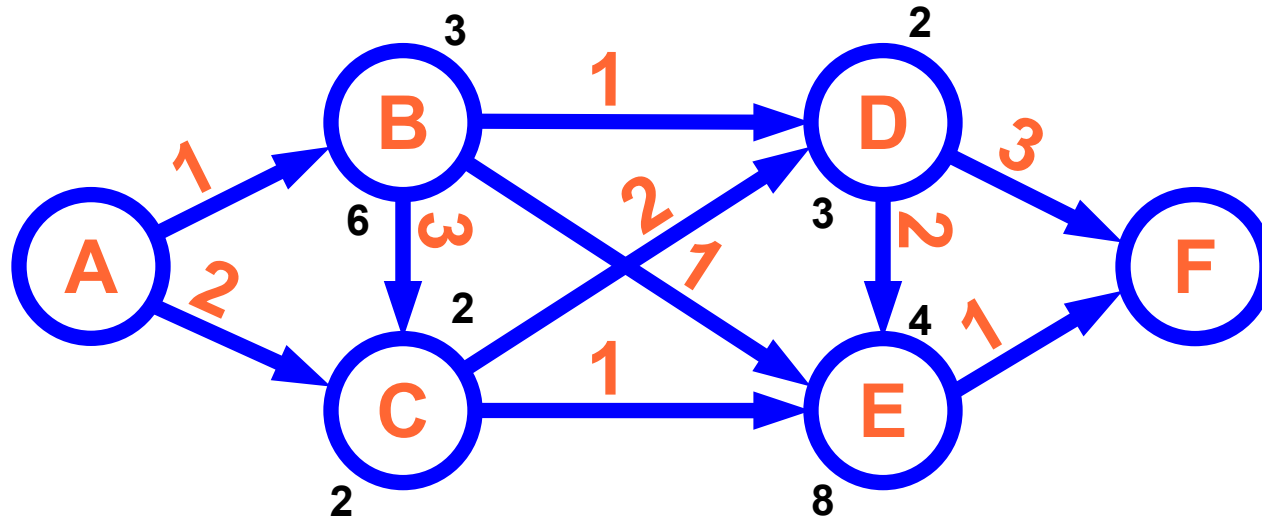
- Source
- Sink
- No Cycle!



# Completion Time Graphs



# Slack Time Graph



From A to F:

- Least expensive path?
- Fastest path?
- Cost difference?
- Most forgiving path?
- Optimum path?

- **Projects conduct activities using resources**
- **Estimates attempt to predict resource consumption during project**
- **Graphs can help us measure cost, time of multiple alternatives**
- **Project time management requires basic understanding of graph theory**