

Time-Cost Trade-off

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Time-Cost Trade-off

- Project duration can be reduced by assigning more resources to activities
 - Re-planning (no cost increase)
 - Assigning more resources (increase in direct cost)

1/9/2023

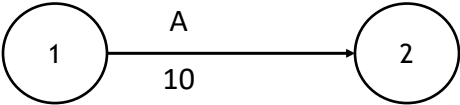
Crashing


2


2

Re-planning

- Digging a canal (1 km)








- 10 Poclain-days + 30 man-days


1/9/2023 Crashing 3

3


Re-planning


- Digging a canal (1 km)

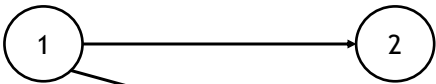
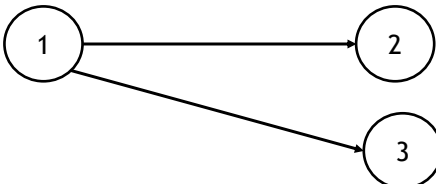




| | | | | |
|--|----|--|----|--|
| | A1 | | A2 | |
| | 5 | | 5 | |





Completed
in 5 days

- 10 Poclain-days + 30 man-days

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Crashing

| Activity | Predecessor | Duration (days) | | Cost (₹) | | Slope |
|----------|-------------|-----------------|-------|----------|-------|-------|
| | | Normal | Crash | Normal | Crash | |
| A | - | 3 | 1 | 8000 | 8400 | 200 |
| B | - | 5 | 3 | 3000 | 4600 | 800 |
| C | - | 4 | 4 | 9000 | 9000 | - |
| D | A,B | 6 | 4 | 7800 | 9000 | 600 |
| E | B,C | 7 | 5 | 10000 | 11000 | 500 |
| | | | | 37800 | | |

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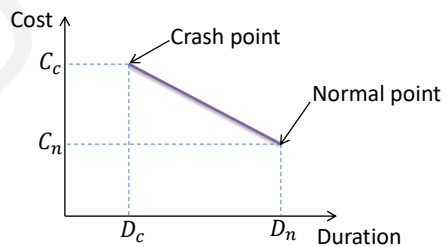
Crashing

5

5

Slope

| Activity | Predecessor | Duration (days) | | Cost (₹) | | Slope |
|----------|-------------|-----------------|-------|----------|-------|-------|
| | | Normal | Crash | Normal | Crash | |
| A | - | 3 | 1 | 8000 | 8400 | 200 |



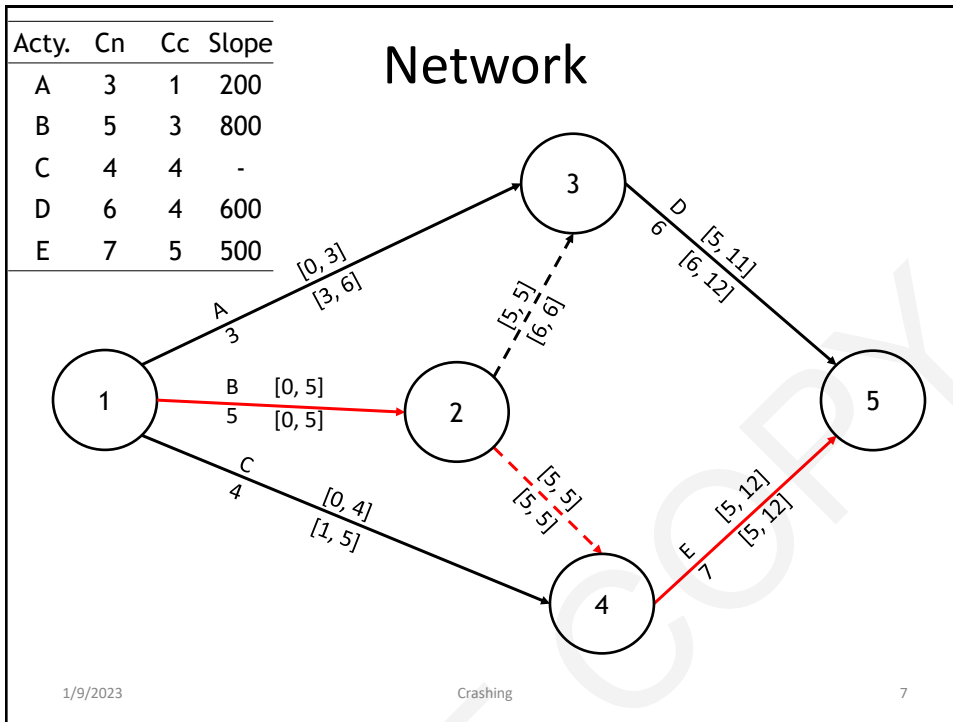
$$\text{Slope} = \frac{C_c - C_n}{D_n - D_c}$$

1/9/2023

Crashing

6

6



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Cost Calculations

| S.NO. | Crashed Activity | Time | DIRECT COST | INDIRECT COST | TOTAL COST |
|-------|------------------|------|-------------|---------------|------------|
| 1 | | 12 | 37800 | 12000 | 49800 |

E is chosen
Crash Limit = 2

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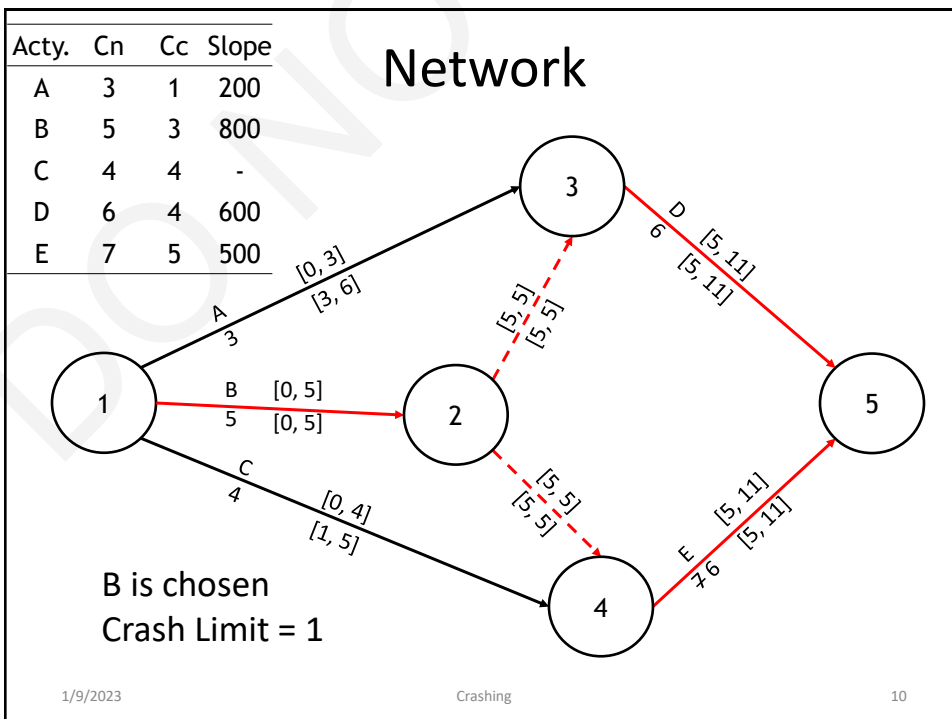
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Cost Calculations

| S.NO. | Crashed Activity | Time | DIRECT COST | INDIRECT COST | TOTAL COST |
|-------|------------------|------|-------------|---------------|------------|
| 1 | | 12 | 37800 | 12000 | 49800 |
| 2 | E | 11 | 38300 | 11000 | 49300 |

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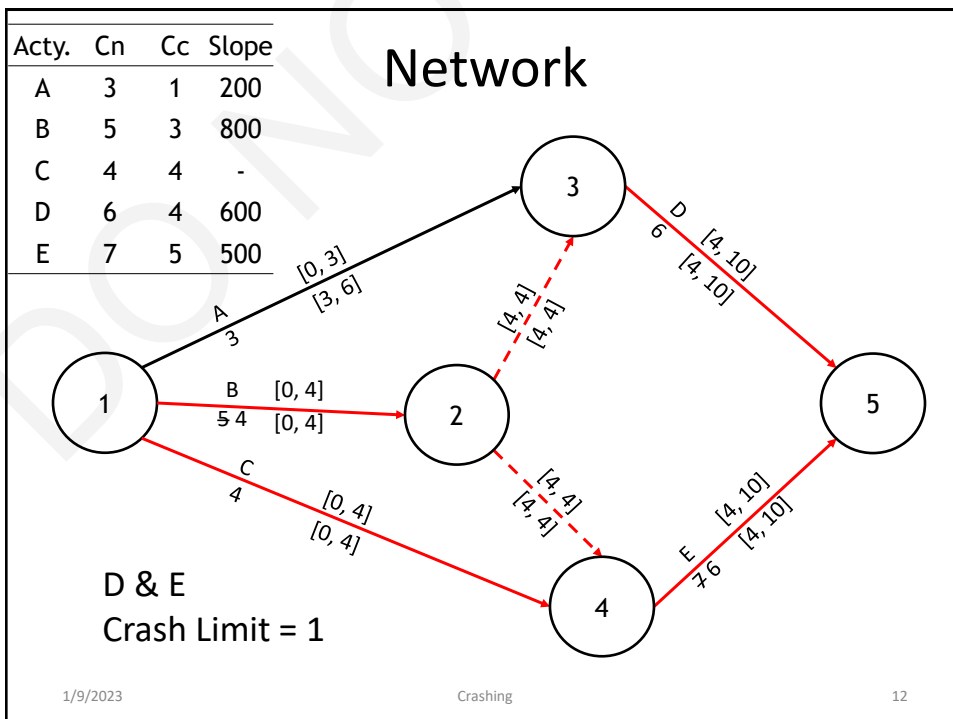
10

Cost Calculations

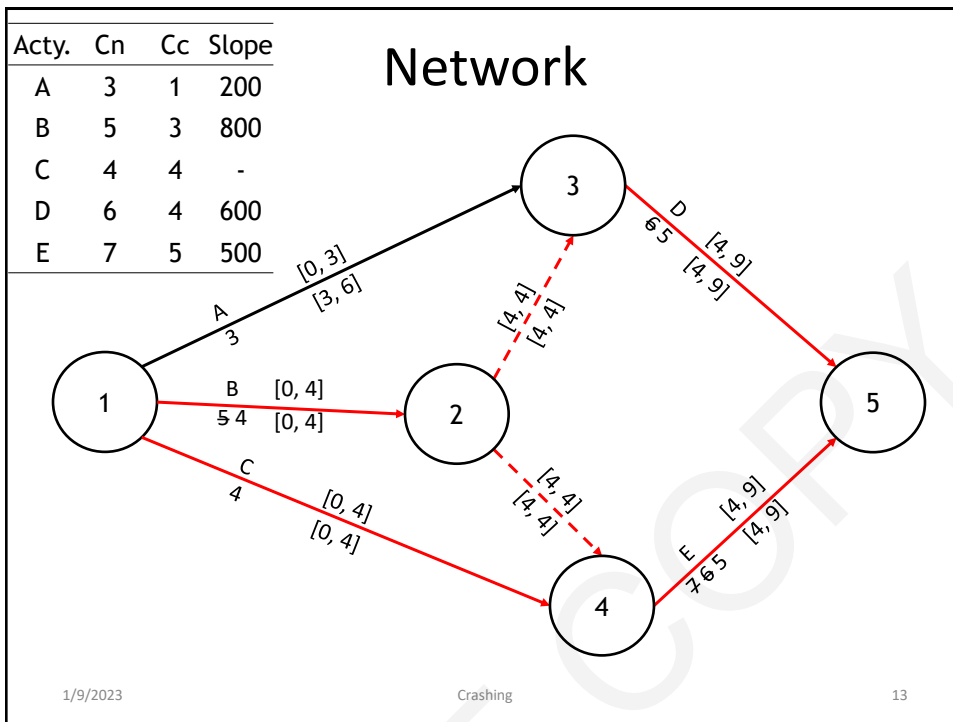
| S.NO. | Crashed Activity | Time | DIRECT COST | INDIRECT COST | TOTAL COST |
|-------|------------------|------|-------------|---------------|------------|
| 1 | | 12 | 37800 | 12000 | 49800 |
| 2 | E | 11 | 38300 | 11000 | 49300 |
| 3 | B | 10 | 39100 | 10000 | 49100 |

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Crashing
11

11



12



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Cost Calculations

| S.NO. | Crashed Activity | Time | DIRECT COST | INDIRECT COST | TOTAL COST |
|-------|------------------|------|-------------|---------------|------------|
| 1 | | 12 | 37800 | 12000 | 49800 |
| 2 | E | 11 | 38300 | 11000 | 49300 |
| 3 | B | 10 | 39100 | 10000 | 49100 |
| 4 | D&E | 9 | 40200 | 9000 | 49200 |
| | | | | | |

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