Critical matrices

→ visits →

→ visitors → person who visits.

→ unique visitors → those who visit for first time.

→ bounce rate - percentage of single page ~~visit~~ sessions in web which the user leaves the site from the welcome page without interacting with the page.

→ exit rate - No. of times person leaves website & navigate to other site.

critical : unique visitors
Bounce Rate
Exit Rate

find exit rate :

M : Page A → B → C
T : B → Exit
W : A → C → B
T : Page C → Exit
F : B → C → A

exit rate

Page A → 1/3

Page B = 2/4 = 1/2

page C = 2/4 = 1/2

bounce rate : A → 0

(single page visit) B → 1/4

C → 1/4

→ conversion rate is defined as the outcomes divided by the total no. of unique visitors or visits.

→ Engagement : how users are engaged with product or services.

→ Micro and macro conversion : A task ~~actual~~ which will give more weightage to analysis → macro.

micro → unique page visitors, bounce rate

micro

processed milestone. → Bounce rate, engagement

secondary action → provide notification to user

★★★★ PULSE & HEART metrics

This pulse metrices is used to understand health of the product (If it is popular or not).

PULSE → P → Page View
U → up time
L → Latency time
S →
E → } seven day active users.

The most commonly used large scale metrics are focused on business or technical aspects of a product & they are widely used by many organizations to track overall product health.

Page View → The average number of web visit at certain period of time.

~~example~~

Uptime → The average number of hours that the website ~~is~~ in service in certain period of time.

Latency time - The average time that is needed to access the web in certain period of time.

* Seven day active users - The average number of different visitors who visit the web in certain period of time.

HEART metrices.

→ used for measuring the ~~customer~~ customer experience.

* Heart is used for measuring user's experience quality and providing actionable data.

H → happiness.
E → Engagement
A → Adoption.
R → Retention.
T → Task success.

→ happiness - to describe metrics that are attitudinal in nature subjective aspects of your experience like satisfaction, visual appeal, likelihood to recommend, ease of use.

→ Engagement - ~~Live~~ It is the user's level of involvement with a product. It is used to check behavioural proxies such as the frequency, intensity, or depth of interaction over some period of time.

→ Adoption - Adoption metrics track how many new users start using a product during a given time period.

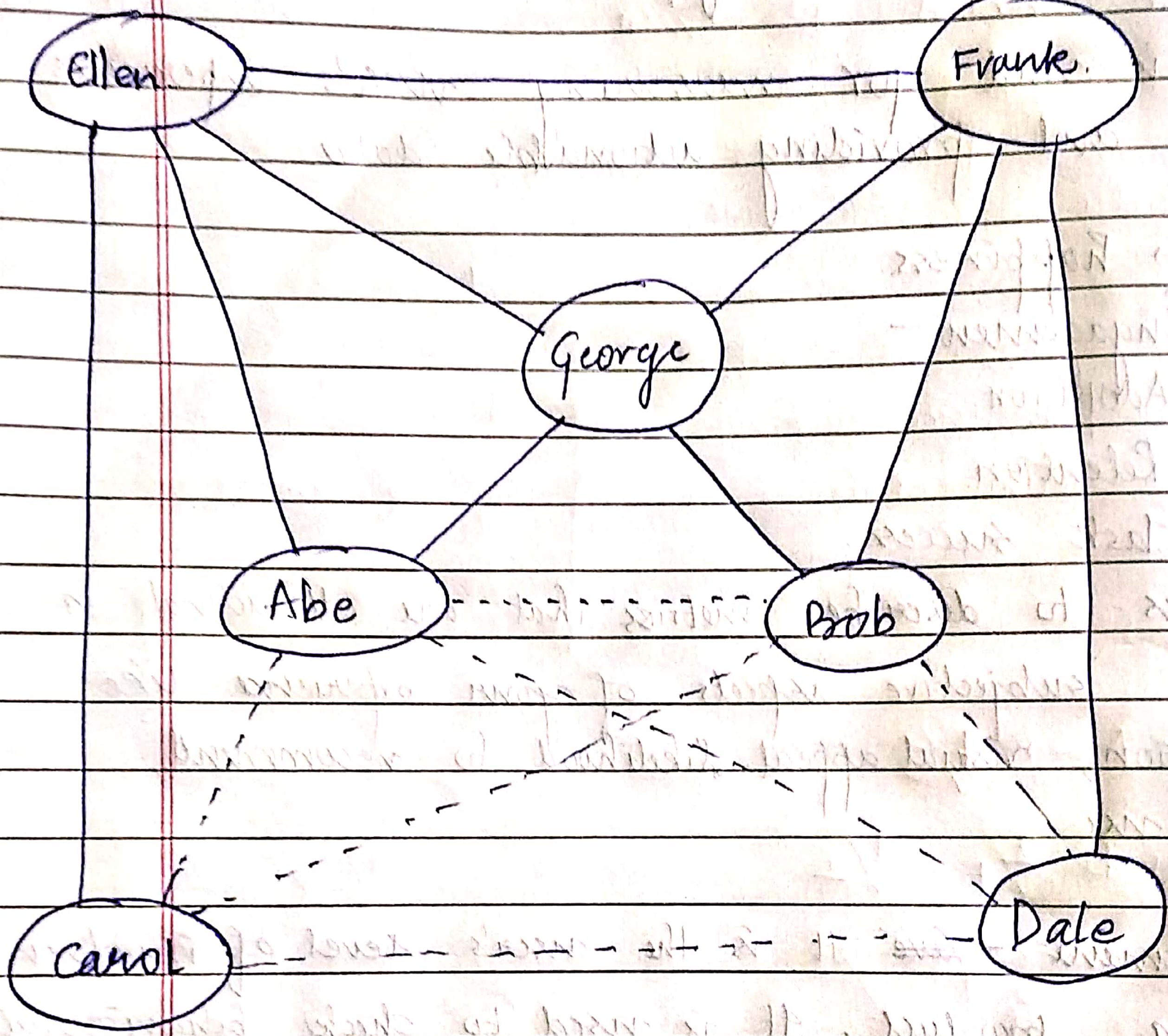
→ Retention - Metrics tracks how many of the users from a given time period are still present in later time period.

→ Task success - It gives efficiency, effectiveness (% of task completed in given time), error rate

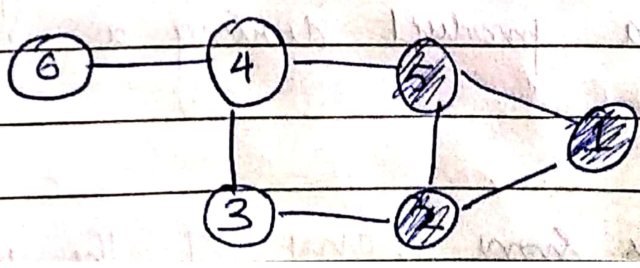
Unit - IV

Facebook Minning

OGP → open graph protocol.



Abe - Bob, carol, Dale, George, Ellen



select the options | common in all critical path (i.e all having 21) | sum of slopes of combination.

6	B	2500 ✓	B	20	[74000 + 2500] +
	DCE	10000			[2800 × 20] = 1,32,500
	DCF	11000			
7	B	2500 ✓	B	19	[76500 + 2500] +
	DCE	10000			[2800 × 19] = 1,32,200
	DCF	11000			optimum duration (minimum)
8	DCE	10000 ✓	DCE	18	[79000 + 10000] +
	DCF	11000			[2800 × 18] =
					₹ 1,39,400

The project duration can be reduced to optimum level of 19 weeks where the TC is at its minimum with ₹ 1,32,200

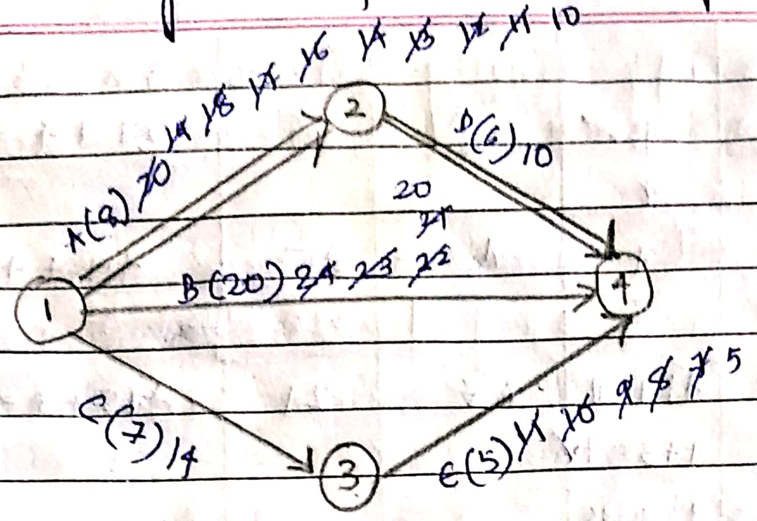
Q) Given the details of a project:

Tasks	Follows Tasks	Time (Days) Normal	Time (Days) Crash	Cost (in ₹) Normal	Cost (in ₹) Crash
A	—	20	8	100	148
B	—	24	20	120	140
C	—	14	7	70	119
D	A	10	6	50	82
E	C	11	5	55	73

What is the total cost & incremental cost after crashing the project duration (critical path)

If you crash a ~~cri~~ path completely & eventhough TC does not stop reducing, stop the crashing.

Date / /20



$E_1 = 0$; $L_1 = 0$

$E_2 = 20$; $L_2 = 20$

$E_3 = 14$; $L_3 = 19$

$E_4 = 30$, $L_4 = 30$

$TC = 100 + 120 + 70 + 50 + 55$

$= 395$

A → D : ~~30~~ ~~29~~ ~~28~~ ~~27~~ 26 ~~25~~ ~~24~~ ~~25~~ ~~23~~ ~~22~~ ~~21~~ 20

C → E : ~~25~~ ~~24~~ ~~23~~ ~~22~~ ~~21~~ 20

B : ~~24~~ ~~23~~ ~~22~~ ~~21~~ 20

Activities	A	B	C	D	E
slope	4	5	7	8	3

$\frac{C_c - C_n}{T_n - T_c}$: $\frac{48}{12}$ $\frac{20}{4}$ $\frac{49}{7}$ $\frac{32}{4}$ $\frac{18}{6}$

crash	options	slope	Activity crashed	critical path (Days)	Total cost
–	–	–	–	30	395
1	A	4 ✓	A	29	395+4= 399
	D	8			
2	A	4 ✓	A	28	399+4 = 403
	D	8			
3	A	4 ✓	A	27	403+4 = ~~411~~ 407
	D	8			

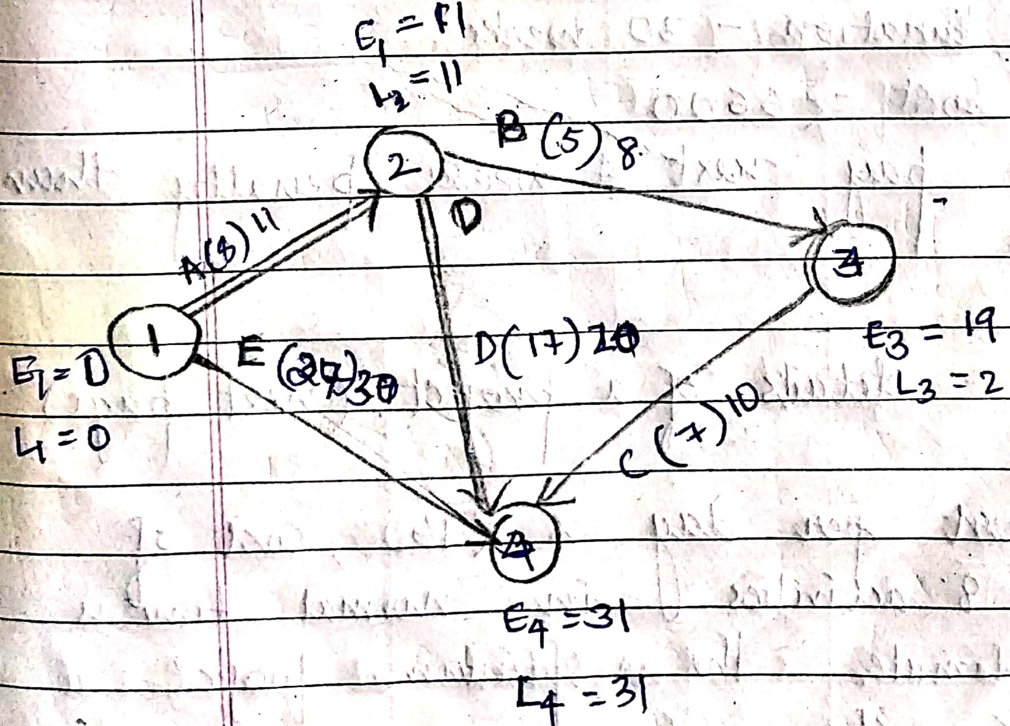
4	A	4 ✓	A	26	407 + 4 = 411
	D	8			
5	A	4 ✓	A	25	411 + 4 = 415
	D	8			
6	AC	4+7=11	AE	24	415 + 7 = 422
	AE	4+3=7 ✓			
	DC	8+7=15			
	DE	8+3=11			
7	ACB	11+5=16	AEB	23	422 + 12 = 434
	AEB	7+5=12 ✓			
	DCB	15+5=20			
	DEB	11+5=16			
8	ACB	16	AEB	22	434 + 12 = 446
	AEB	12 ✓			
	DCB	20			
	DEB	16			
9	ACB	16	AEB	21	446 + 12 = 458
	AEB	12 ✓			
	DCB	20			
	DEB	16			
10	ACB	16	AEB	20	458 + 12 = 470
	AEB	12 ✓			
	DCB	20			
	DEB	16			

The project duration can be reduced to the optimum level of 20 days where the total cost is ₹470

The incremental cost after crashing = 470 - 395
= ₹75

Q) ₹200 per day charged as a penalty for any delay in the completion of the project ~~below~~ beyond 26 week & each of the activities can be accelerated by 3 weeks at an estimated cost of ₹1000 per week reduction. Decide on optimum cost & project completion time after crashing.

Activities	Follows Activities	Duration
A	–	11
B	A	08
C	B	10
D	A	20
E	–	30



A → D : ~~31~~ ~~30~~ 29

A → B → C : ~~29~~ ~~28~~ 27

E : ~~30~~ 29

Duration of Penalty = 31 - 26 = 5 weeks
penalty per week = (₹200 × 7) = ₹1400 per week

∴ Total cost = Direct + Indirect cost
= 0 + [₹1400 × 5] = ₹7000

~~Crash~~

Crash	options	slope	critical path	TC
—	—	—	31	0 + [₹1400×5] = ₹7000
1	A D	1000 ✓ 1000	30	~~0~~ + 1000 + [₹1400×4] = ₹6,600
2	AE DE	2000 ✓ 2000	29	3000 + [₹1400×3] = ₹7200.

It can only be reduced by 1 week, ~~bcoz of it has minimum value then~~
optimum duration - 30 weeks
optimum cost - ₹6600
feasible to pay next 4 weeks penalty then crashing.

1 Q) Given the details of a project (next page)

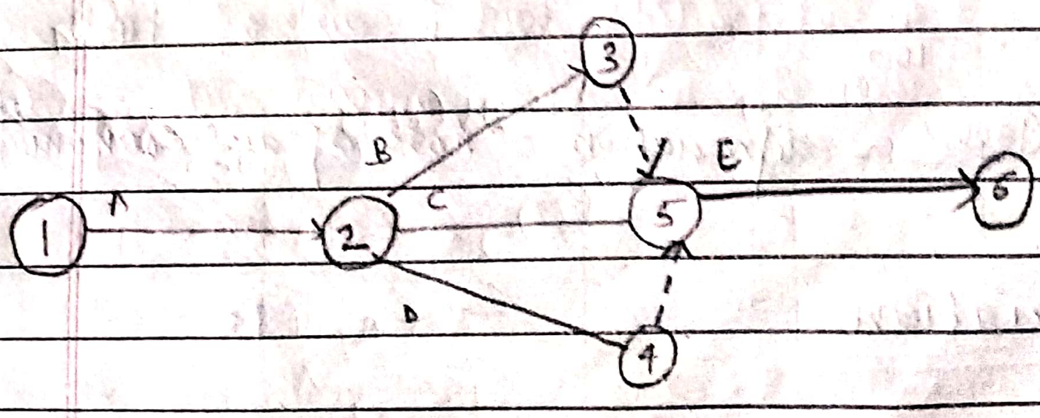
(Indirect)
Overhead cost per day is ₹160, cost of completing 8 activities in normal time is ₹6500. Estimate the optimum project duration & cost.

Tasks	Time (Days)		Cost - time slope (₹/day)
	Normal	Crash	
1-2	6	4	80
1-3	8	4	90
1-4	5	3	30
2-4	3	3	—
2-5	5	3	40
3-6	12	8	200
4-6	8	5	50
5-6	6	6	—

2Q) Given the project details.

Tasks	follows Task(s)	Time (Months)		Cost (₹)	
		Normal	Crash		
A	—	6	4	60	90
B	A	5	4	30	80
C	A	10	8	80	160
D	A	8	6	50	100
E	B, C, D	6	5	40	60

Identify optimum project duration & cost



3Q) The following table gives the details of a construction project & other relevant information.

Activities	Follows Activities	Time (Days ~~Months~~) Normal	Crash	Cost (₹) Normal	Crash
A	–	4	3	60	90
B	–	6	4	150	250
C	–	2	1	38	60
D	A	5	3	150	250
E	C	2	2	100	100
F	A	7	5	115	175
G	DBG	4	2	100	260

Indirect cost varies as follows:

Days	15	14	18	12	11	10	9	8	7	6
cost (₹)	600	500	400	250	175	100	75	50	35	25

Determine the project duration that will result in minimum project cost.

1998 → 1400

2018 → 100

1300 → depreciation. → loss of an economic asset.

Q) Depreciation

Q) A machine was purchased at an initial cost of Rs 80,000 with an estimated salvage value of Rs 12,000, at the end of 8 years of

In theory notes → Learn only straightline eqn.

Date / /20

useful life, calculate:
i) Annual Rate of depreciation
ii) Depriciation fund at end of 4 years
iii) Book – value at end of 4 years useful life.

$C = 80{,}000$ → Initial cost (First cost)

S – ₹12,000 → Salvage / scrap / residual.

n – 8 years. → useful economic life.

i) $D_t = \frac{C-S}{n}$, D_t → annual rate of depreciation

$$D_t = \frac{80{,}000 - 12{,}000}{8} = \frac{68{,}000}{8} = ₹8500$$

ii) $DF_t = D_t \times t$

$\therefore DF_4 = 8500 \times 4$

$= ₹34{,}000$

iii) Book - Value, $BV_t = C - DF_t$

(what is the amount left after depreciation)

$BV_4 = 80{,}000 - 34000$

$= ₹46000$

$(C-S)$ → total depreciation amount to be recovered

Q) Calculate the annual rate of depreciation, for the details given:

actual cost when you purchase from company

Invoice cost – ₹1,20,000

Transportation charges – ₹6000

Installation charges – ₹8000

Accessories - ₹2500
Salvage value - ₹20,000
Estimated Life = 12 years

$$D_t = \frac{C - S}{n}$$

where, C = ₹1,20,000 + ₹6000 + ₹8000 + ₹2500
S = 20,000
n = 12 yrs.

$$D_t = \frac{1,36,500 - 20,000}{12}$$

= ₹ ~~134833.33~~ 9708.33

Q) A machine was purchased on 1st Jan 2010. at ₹6 lakhs and estim~~ita~~ated to last till 31st December 2022, The expected salvage value is 32000, Calculate the annual rate of depreciation ~~as on~~ and the depreciation fund as on 15th July 2015.
After 8 years of working the machine is deplinished (upgraded) with an addition cost of ₹60,000. Calculate the new annual rate of depreciation

$$D_t = \cancel{6,00,0} \frac{C - S}{n} = \frac{₹600,000 - ₹32000}{13}$$

= ₹43692.30

If you use for 1day or 1 month, 1 year depreciation charge is taken.

$DF_t = D_t \times t$
$= ₹43,692.30 \times 6 = ₹262153.84$

$13 - 8 = 5$
$n = 5$ year.
new c = $[₹6,00,000 - (43,692.3 \times 8)] + ₹60000 = 310461.6$

$\therefore$ New $D_t = \frac{₹310461.6 - 32000}{5}$
$= 55692.32$

Sunk-cost: Sunk cost is that part of the expenditure made by the firm ~~dept~~ can not be recovered irrespective of any future course of action. The sunk-cost is also called as historical past cost.
Then, sunk-cost = Book-value - realizable market value.

Q) The dealer of a new machine offers to buy the old machine in your workshop at ₹ 20,000 after 8 years of its useful life. The old machine was purchased at ₹1,80,000 with an estimated salary value of ₹16,000 after 10yrs of useful life. Calculate the sunk cost. Is it viable to replace the old machine with a new one.

$C \rightarrow ₹1,80,000$
$S - ₹16,000$
$n = 10$ yrs

sunk-cost = Book-value − Realizable Market Value

$$= \left[₹1,80,000 - \left\{ \left(\frac{1,80,000 - 16000}{10} \right) \times 6 \right\} \right] - ₹20,000$$

$= \underline{\underline{₹61600}}$ } → not viable to replace
↳ permanent loss not recoverable.

1)