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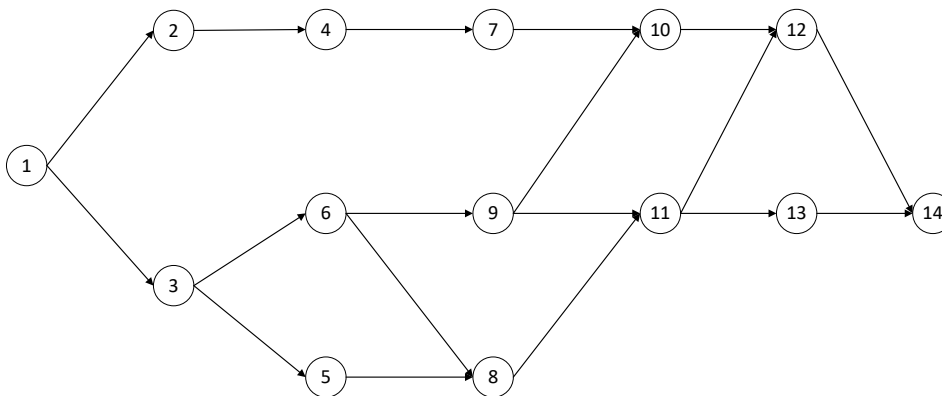
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Subject : **Project Management**

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Homework -2

Ans 1、 Using the program evaluation and review technique to calculate the probability the project can be finished before 70 days.



Activity	Optimistic time /t _o	Realistic time/t _m	Pessimistic time/t _p	Expected mean time/t _e	Variance σ
1	4	5	8	5.333	0.445
2	4	6	9	6.167	0.689
3	6	9	13	9.167	1.369
4	10	12	18	12.667	1.767
5	5	7	9	7.0	0.449
6	11	12	14	12.167	0.25
7	9	10	15	10.667	1.00
8	4	6	8	6.0	0.449
9	7	10	13	10.0	1.00
10	8	9	14	9.667	1.00
11	4	7	8	6.667	0.449
12	6	8	12	8.333	1.00
13	6	7	10	7.333	0.449
14	3	5	9	5.333	1.00

Expected Mean time (t_e) Formula :

$$t_e = \frac{t_o + 4 t_m + t_p}{6}$$

To find Variance (σ^2) Formula :

$$\sigma^2 = \left(\frac{t_p - t_o}{6} \right)^2$$

To find latest time and earliest time by forward and backward passing as follows:

0	1	5.333	0
0	$t_e=5.333$	5.333	0

5.333	2	11.5	1.833
7.166	$t_e=6.167$	13.333	0

5.333	3	14.5	0
5.333	$t_e=9.167$	14.5	0

11.5	4	24.167	1.833
13.333	$t_e=12.667$	26	0

14.5	5	21.5	12.167
26.667	$t_e=7$	33.667	5.167

14.5	6	26.667	0
14.5	$t_e=12.167$	26.667	0

24.167	7	34.834	1.833
26	$t_e=10.667$	36.667	1.833

26.667	8	32.667	7
33.667	$t_e=6$	39.667	4

26.667	9	36.667	0
26.667	$t_e=10$	36.667	0

36.667	10	46.334	0
36.667	$t_e=9.667$	46.334	0

36.667	11	43.334	3
39.667	$t_e=6.667$	46.334	0

46.334	12	54.667	0
46.334	$t_e=8.333$	54.667	0

43.334	13	50.667	4
47.334	$t_e=7.333$	54.667	4

54.667	14	60	0
54.667	$t_e=5.333$	60	0

Now,

Critical Path is = 1 – 3 – 6 – 9 – 10 – 12 – 14.

Normal expected Project duration (length) = Summation of critical path t_e , = 1+3+6+9+10+12+14

$$= 5.333 + 9.167 + 12.167 + 10.0 + 9.667 + 8.333 + 5.333$$

$$= 60 \text{ days}$$

Variance σ^2 = Summation of critical path variance σ

$$\begin{aligned}\sigma^2 &= 1 + 3 + 6 + 9 + 10 + 12 + 14 \\ &= 0.445 + 1.369 + 0.25 + 1.00 + 1.00 + 1.00 + 1.00\end{aligned}$$

Project length variance, $\sigma^2 = 6.064$

Project length standard deviation, $\sigma = 2.465$

Probability,

To calculate the standard normal variable,

$$D = \frac{T_s - T_e}{\sigma}$$

Where,

T_s is the schedule time to complete the project.

T_e is the normal expected project length.

σ is expected standard deviation of the project length.

The probability that the project will be completed in 70 days is give by,

$$P (Z \leq D)$$

We know,

$$T_s - T_e$$

$$D = \frac{\quad}{\quad}$$

$$\sigma$$

$$70 - 60$$

$$= \frac{\quad}{\quad}$$

$$2.465$$

$$= 4.056$$

Probability,

$$P(Z \leq D)$$

$$P(Z \leq 4.056)$$

As per Standard Normal Distribution table it is 99.99% (Answer)

