Department of Computer Applications
23MX21 – SE – Tutorial 1

Consider an Organic project and it is decomposed into 7 distinct functions. Apply decomposition techniques to compute total number of lines of code, cost required and effort required to complete the project. Use the following empirical equation to propose the LOC values: $C_1 + C_2F$ where C_1 and C_2 are constants and F is the Function number. Use the following constant table to propose three LOC values. ~~Assume that 2% of m will be paid as $/Loc.~~

Constants/LOCs	a	m	b
C1	351	373	450
C2	624	692	737

Using the above LOC value, apply COCOMO method to compute other estimates by assuming the following cost drivers. Very high skilled programmer and analyst; High - Data Base size; Low product complexity; High - application experience.

Dr.AS - 23MX21 – SE – Tutorial 1 – 12th Feb 2024 [15 Marks]

Answer Key

Type of the Project: ORGANIC; 7 Functions

Constant Table is given

Constants/LOCs	a	m	b
C1	351	373	450
C2	624	692	737

Apply Decomposition Technique to estimate L

Construct Cost Table with the following rows

COST Table	a	m	b	Le
1	975	1065	1187	1070
2	1599	1757	1924	1759
3	2223	2449	2661	2447
4	2847	3141	3398	3135
5	3471	3833	4135	3823
6	4095	4525	4872	4511
7	4719	5217	5609	5199
				21944

Therefore, LOC required for the Project = 21,944

Now, for the remaining calculations use COCOMO.

Calculate Nominal Effort

Effort = a (size in kloc)^{b}

Organic Project: a = 3.2 and b = 1.05

Effort = 3.2 $(21.944)^{1.05}$ = 81.95 person-months

Improve this Effort using the given Cost Drivers

1. Very high - skilled programmer – 0.70
2. Very high - skilled analyst - 0.71
3. High - Database size - 1.08
4. Low – Product complexity - 0.85
5. High – Applications Experience - 0.91

True Effort = 0.70 x 0.71 x 1.08 x 0.85 x 0.91 x 81.95
= 34.02 person-months

Calculate the Duration

Duration = c (true effort in person-months)^{d}

= 2.5$(34.02)^{0.38}$
= 9.55 months

Schedule Distribution [32 KLOC]

Stages	%age	Schedule in Months
Analysis	12	1.15
Design	19	1.81
Coding	55	5.25
Testing	26	2.48
Total Duration including Analysis		10.69

Effort Distribution [32 KLOC]

Stages	%age	Effort in PMs
Analysis	6	2.04
Design	16	5.44
Coding	62	21.09
Testing	32	7.48
Total Effort including Analysis		36.05

Man Power Requirement

Stages	Effort[2]	Duration[3]	Man-power[2/3]
Analysis	2.04	1.15	2
Design	5.44	1.81	3
Coding	21.09	5.25	4
Testing	7.48	2.48	3
Total Man-power			12 Persons

Summary of the Results

1. Number of Lines of Code = 21.944 KLOC

2. Total Effort including Analysis = 36.05 pms

3. Total Duration including Analysis = 10.69 months

4. Total Man-Power = 12 persons
