Date - 04/05/2023

SPM chapter :- 2

Cost Estimation :-

1. CoCoMo - I & II (cost Constructive Model)
2. FPA - Function Point Analysis
3. Delphi

a + b = c
Input a = 3
b = 4

Python :-

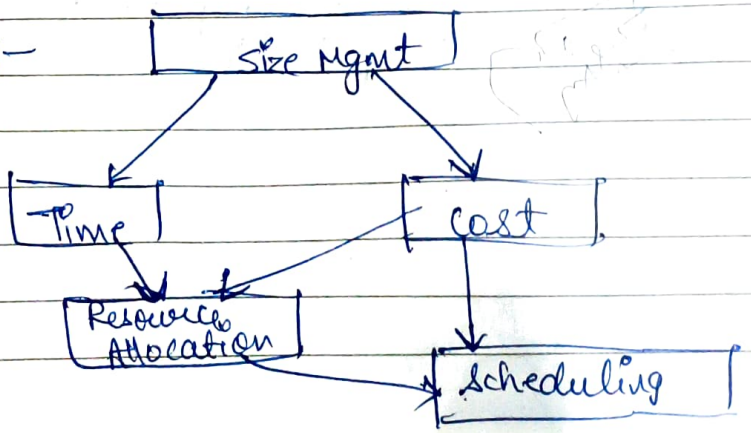
```
a = input ("Enter number 1 :")
b = input ("Enter number 2 :")
c = a + b
print ("The addition is : " c)
```

KLOC = 1000 lines of code

9 months

- Scope - modules
- Risk (Risk Mgmt)
- Size (Duration)
- Cost - COCOMO I & II
- Resources
- schedule

Size Mgmt :-



FPA :- Function point analysis — Allan albrecht in 1970 in south California university

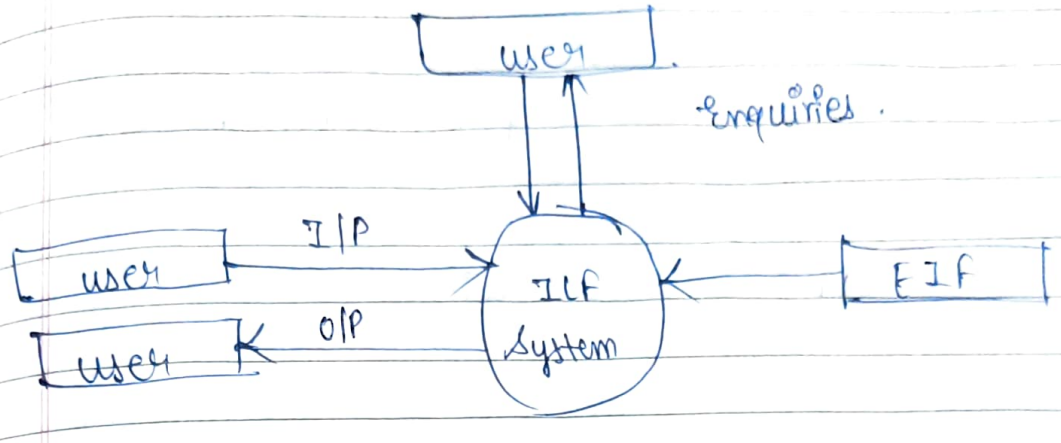
five units :-

1. EI (External Input)
2. EO (External Output)
3. EQ (External Enquires)
4. ILF (Internal logical files)
5. EIF (External Interface files)

- It is developed by allan albrecht in 1970 in South California university for purpose of size estimation.
- FPA estimate the size of software as per the user's perspective.
- FPA mainly works on five units

1, 2, 3 — EI, EO and EQ all are associated with user & system for sharing data/ queries, so it called as a data processing units.

- without execution ILF & EIF; execution of system is highly impossible so they called as a transact^n processing units.



* Question (Problem Stmnt)

units / weighting factors	Low	Average	High
EI	3	4	6
EO	4	5	7
EQ	3	4	6
ILF	7	10	15
EIF	5	7	10

By considering the requirement documents there is a need to identify the count of all five units along with their weightage (low, avg, high)

Note :- If weigtage is not given in a requirement doc / problm Stmnt then by default use values of Avg weigting factor.

weighting factors of every units are as follows.

1→ UFP → undefined function Point / function Count

~~Count of each un~~

By using functional units need to calculate unadjusted function point (UFP) by using following formula.

$$UFP = \sum_{i=1}^{5} \sum_{j=1}^{5} \Sigma_{ij} w_{ij}$$

where i defined row and j indicate column

It is a summation of multiplicat" of every functional units with their weighting factor.

$$= EI \cdot WF + EOX W \cdot F + EQ \cdot WF + ILF \times W \cdot F + EIF \cdot WF$$

EI = 40 X 4 = 160
EO = 30 X 5 = 150
EQ = 20 X 4 = 80
ILF = 10 X 10 = 100
EIF = 5 X 7 = 35
UFP = 525

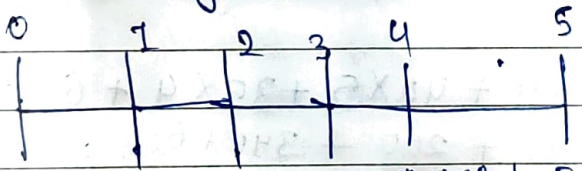
For a Calculat" of Complexity adjustment factor need to consider 14 factors which are associated with internal part of the software & its execut"

1. Does the system require reliable backup & recovery ?
2. Is data Comm. required ?
3. Are there distributed processing functions
4. Is performance Critical
5. Will the system run in an existing heavily utilized

operational environment ?

6. Does the system onlin data entry ?
7. Does the online data entry require the input transaction to be built over multiple screens or operations ?
8. Are the files updated online ?
9. Is the inputs, outputs, files or inquiries complex ?
10. Is the internal processing complex ?
11. Is the code designed to be reusable ?
12. Are Conversion & installation included in the design ?
13. Is the system designed for multiple installations in dif organization ?
14. Is the applicat^{h} designed to facilitate change & ease of use by the user.

Rate factors =



$\sum_{i=1}^{14} f_i$ = Addition of the rating of each factor.

Note :- If rating preferences is not given in problm stmnt then by default need to Consider avg value.

Function points or Funct^{n} count Calculated by using following formula

CAF =

FP/FC = UFP * CAF

where $CAF = 0.65 + 0.01 \times \sum_{i=1}^{14} f_i$

Q*1 Consider a project with following functional counts:

1 No of user inputs - 50
2 No of user outputs - 40
3 No of user inquiries - 35
4 No of user files - 6
5 No. of External Interfaces - 4

Assume all complexity adjustment & weighting factors are avg.

Compute the function points for the project

UFP = 50X4 + 40X5 + 35X4 + 6X10 + 4X7
= 200 + 200 + 340 + 60 + 28

UFP = 628

$$CAF = 0.65 + 0.01 \times \sum_{i=1}^{14} f_i$$

$\sum f_i$ = Addition of rating factors.
= 3+3+3+3+3+3+3+3+3+3+3+3+3+3
$\sum f_i = 42$

0.65
0.01
0.66

CAF = 0.65 + 0.01 X 42
= ~~0.66 X 42~~ 0.65 + 0.42
= 1.07

4.2. Consider following functional units for project

1. No of user I/P = 60 with high weighting factor
2. No of user o/p = 55 with high ——"——
3. No of user Enquiries = 32 with
4. No of user files = 12 with high ——"——
5. No of External Interfaces = 7 with low weightage.

Apart from this system requires up

1. System require reliable back & recovery.
2. Moderately data Comm. is required.
3. Master files must be updated online.
4. Internal processing is Complex.
5. Code will be moderately usable.
6. Significantly Conversion & installations included in design.
7. Remaining factors will be treated as avg.

Compute the function point for the project.

$$UFP = 60 \times 6 + 55 \times 7 + 32 \times 4 + 12 \times 15 + 7 \times 5$$
$$= 360 + 385 + 128 + 180 + 35$$
$$= 1088$$

$$CAF = 0.65 + 0.01 \times \sum_{i=1}^{14} f_i$$

$$\sum f_i = 3 + 2 + 5 + 3 + 2 + 4 + 24$$
$$= 47$$

$$= 0.65 + 0.01 \times 47$$
$$= 0.65 + 0.47 = 1.12$$

19
24
43

23
24
47

0.65
0.47
1.12

1088.00
+ 1.12
1089.12

FP/FC P = UFP + CAF
= 1088 + 1088 1.12
= 1218.56
= 1219.

Q.3. EI = 192 high
EO = 115 Avg
EQ = 37 Avg
ILF = 35 high
EIF = 45 Avg.

Apart from this System requires
1) Multiple installat^n
2) very Critical Performance
3) Significant online data entry
4) Code will be incidentally reusable
5) remaining factor sig

= 192 X 6 + 115 X 5 + 37 X 4 + 35 X 15 + 45 X 7
= 1152 + 575 + 148 + 525 + 315
= 2715

14
4

Σf_i = 5 + 5 + 4 + 1 + 30
= 45

30
15
45

= 0.65 + 0.01 X 45
= 0.65 + 0.45
= 1.10

0.65
0.45
1.10

FP = 2715 + 1.10
= 2716.1