

Level of involvement	impact
If no influence	0
If incidental	1
If modurate	2
If average	3
If significant	4
If essential	5

### Function Point (FP)/Function Count (FC) Metric:

It is given by 'Aldretch'

$$FP = UFP (\text{unadjusted FP}) \times TCF (\text{Technical complexity Factor})$$

OR

CAF (Complexity Adjustment Factor)

- $FP = UFP \cdot CAF$  or
- $FC = UFC \cdot TCF$  or
- $FC = UFC \cdot CAF$
- FP is multiplicative in nature

### Unadjusted function point / count (UFP/UFC):

UFP depends on following parameter

#### 1. Number of inputs (NoI):

It is number

Supply to program

e.g.  $C = \text{sum}(a, b)$

#### 2. Number of outputs (NoO):

Internal

#### 3. Number of Interfaces (NoIn):

Modular required interfaces to interact each other.

#### 4. Number of Files (NoF):

Files associated with the software

#### 5. Number of External Interfaces (NoE):

To interact with the end user.

### Counting function points:

Function points are counted by the following expression

$$UFP = \sum_{i=1}^5 W_{ij} \cdot Z_{ij}$$

- where the value of  $j$  will be either 1 or 2 or 3 depending on level of the project and  $Z_{ij}$  is the count for components 'i' at level 'j' which is the fixed weight assigned by the Albrecht procedure.
- These function counts are also known as unadjusted function points (UFP) and are calculated by using the weights given in the following table

### Categories of project: 1980

- Simple/Application/Organic: Well known
- Average/utility/Semedetech: Simple + complex
- Complex/system/embedded: Unknown

**Weight metric for UFP:**

Function type	Simple	Average	Complex
External input	3	4	6
External output	4	5	7
Logical internal file	7	10	15
External interface file	5	7	10
External inquiry	3	4	6

**Example:** Table of various data given below. Calculate UFP in average case.

	Data	Weight(Avg)	Total Data
(i) NoI	5	4	$5 \times 4 = 20$
(ii) NoO	4	5	$4 \times 5 = 20$
(iii) NoIn	5	4	$5 \times 4 = 20$
(iv) NoF	2	10	$10 \times 2 = 20$
(v) NoE	5	7	$5 \times 7 = 35$
			Total UFP = 115

$$\text{UFP} = \sum \text{wt} \times \text{No} = \sum_{i=1}^5 w_{ij} \cdot \text{No}_i$$

If  $J = 1 \rightarrow$  simple

$J = 2 \rightarrow$  average

$J = 3 \rightarrow$  complex

**Problem:** Consider a software project with the following information domain characteristic for calculation of function point metric.

Number of external inputs (I) = 30

Number of external output (O) = 60

Number of external inquires (E) = 23

Number of files (F) = 08

Number of external interfaces (N) = 02

It is given that the complexity weighting factors for I, O, E, F and N are 4, 5, 4, 10 and 7, respectively. It is also given that, out of fourteen value adjustment factors that influences the development effort, four factors are not applicable, each of the other four factors have value 3, and each of the remaining factors have value 4. The computed value of function point metric is\_\_\_\_\_.

[GATE-2015]

Ans. (612.06)

Soln.  $I = 30, O = 60, E = 23, F = 08, N = 02$

Complexity weighting factors for I, O, E, F and N are 4, 5, 4, 10 and 7 respectively.

$$\text{UFP} = 30 \times 4 + 60 \times 5 + 23 \times 4 + 08 \times 10 + 02 \times 7 = 606$$

14 value adjustment factors

$$\Rightarrow \text{Total degree of influence} = 4 \times 0 + 4 \times 3 + 6 \times 4 = 12 + 24 = 36$$

$$\therefore \text{VAF} = 36 \times 0.01 + 0.65 = 1.01$$

$$\text{Function point metric} = \text{UFP} \times \text{VAF} = 606 \times 1.01 = 612.06.$$