**Assignment No : 3**

**Q.1: Find the product size estimation based on function point.**

**Ans:** Estimation with function point based on the:

* Number of input items (I): those items provided by the user that describe distinct application-oriented data. (e.g. file names).
* Number of output items (O): those items provided to the user that generate distinct application-oriented data. (e.g. reports).
* Number of user inquiries (Q): interactive inputs requiring a response.
* Number of files (F): master files in the system.
* Number of external interfaces (E): interfaces to other system.

Function point complexity weight:

|  |  |  |  |
| --- | --- | --- | --- |
| Measurement parameter | simple | average | complex |
| Number of user inputs | 3 | 4 | 6 |
| Number of user outputs | 4 | 5 | 7 |
| Number of user queries | 3 | 4 | 6 |
| Number of files | 7 | 10 | 15 |
| Number of external interfaces | 5 | 7 | 10 |

* **Calculating function point:**

1. Calculate unjustified function points (UFP) as sum of function points for each component FP= (n\*I)+(n\*O)+(n\*Q)+(n\*F)+(n\*E)
2. Compute technical complexity factor (TCF) based on degree of influence (DI) of 14 technical factors(e.g. portability, compatibility). Each factor may have a value between 0.
3. TCF=(0.0….. 0.70)+0.65= a value in range 0.65 … 1.353. compute function points: FP=UFP\*TCF.

* **Compute the initial estimation of efforts :**

Based on person-month: Ei=a\*(KLOC)^b where a and b are constants and depend on the project type.

|  |  |  |
| --- | --- | --- |
| Project type | a | b |
| Organic | 3.5 | 1.05 |
| Semi-detached | 3.2 | 1.12 |
| Embedded | 2.3 | 1.20 |

* Example 1:

If a software product is organic and it is estimated to be 8000 LOC, initial effort is calculated as: Ei=3.5\*81.05= 28 person-months.

* Example 2:

If a software product is embedded and is estimated to be 10,000 LOc, its nominal effort is calculated as: Ei=2.3\*101.20=44 person-months.

* Duration estimation:

Suppose the overall size of an organic software is estimated to be 20,000:

1. Efforts: E=3.5\*201.05= 70 person-months
2. Duration: D=2.5\*E 0.38=13 months

* Cost estimation :

To calculate costs,multiply efforts (person-months) by the average salary of the software developers.

The calculated efforts for the last examples was E=70. Suppose the average monthly salary for each software developer is $6,000: costs=C=70\*6000=420,000.