

Function Point (FP) is an element of software development which helps to approximate the cost of development early in the process. It may measures functionality from user's point of view.

Counting Function Point (FP):

- **Step-1:**

$$F = 14 * \text{scale}$$

Scale varies from 0 to 5 according to character of Complexity Adjustment Factor (CAF). Below table shows scale:

0 - No Influence

1 - Incidental

2 - Moderate

3 - Average

4 - Significant

5 - Essential

- **Step-2:** Calculate Complexity Adjustment Factor (CAF).

$$\text{CAF} = 0.65 + (0.01 * F)$$

- **Step-3:** Calculate Unadjusted Function Point (UFP).

TABLE (Required)

Function Units	Low	Avg	High
EI	3	4	6
EO	4	5	7
EQ	3	4	6
ILF	7	10	15
EIF	5	7	10

Multiply each individual function point to corresponding values in TABLE.

- **Step-4:** Calculate Function Point.

$$\text{FP} = \text{UFP} * \text{CAF}$$

Example:

Given the following values, compute function point when all complexity adjustment factor (CAF) and weighting factors are average.

User Input = 50

User Output = 40

User Inquiries = 35

User Files = 6

External Interface = 4

Explanation:

- **Step-1:** As complexity adjustment factor is average (given in question), hence,
- scale = 3.

$$F = 14 * 3 = 42$$

- **Step-2:**
 $CAF = 0.65 + (0.01 * 42) = 1.07$

- **Step-3:** As weighting factors are also average (given in question) hence we will multiply each individual function point to corresponding values in TABLE.

$$UFP = (50*4) + (40*5) + (35*4) + (6*10) + (4*7) = 628$$

- **Step-4:**
Function Point = $628 * 1.07 = 671.96$

This is the required answer.

Function Point Overview

1) Determine the number of components (EI, EO, EQ, ILF, and ELF)

- a) EI - The number of external inputs. These are elementary processes in which derived data passes across the boundary from outside to inside.
In an example library database system, enter an existing patron's library card number.
- b) EO - The number of external output. These are elementary processes in which derived data passes across the boundary from inside to outside.
In an example library database system, display a list of books checked out to a patron.
- c) EQ - The number of external queries. These are elementary processes with both input and output components that result in data retrieval from one or more internal logical files and external interface files.
In an example library database system, determine what books are currently checked out to a patron.
- d) ILF - The number of internal log files. These are user identifiable groups of logically related data that resides entirely within the applications boundary that are maintained through external inputs.
In an example library database system, the file of books in the library.
- e) ELF - The number of external log files. These are user identifiable groups of logically related data that are used for reference purposes only, and which reside entirely outside the system
In an example library database system, the file that contains transactions in the library's billing system.

2) Compute the Unadjusted Function Point Count (UFC)

- a) Rate each component as low, average, or high.
- b) For transactions (**EI, EO, and EQ**), the rating is based on the **FTR and DET**.

FTR - The number of files updated or referenced. (File Type Record)

DET - The number of user-recognizable fields (Data Element Type).

Based on the table below, an EI that references 2 files and 10 data elements would be ranked as average.

FTR's	DET's		
	1 - 5	6 - 15	> 15
0 - 1	Low	Low	Average
2 - 3	Low	Average	High
> 3	Average	High	High

c) For files (**ILF and ELF**), the rating is based on the **RET and DET**.

RET - The number of user-recognizable data elements in an ILF or ELF. (Record Element Type)

DET - The number of user-recognizable fields. (Data Element Type)

Based on the table below, an ILF that contains 10 data elements and 6 fields would be ranked as high

RET's	DET's		
	1 - 5	6 - 15	> 15
1	Low	Low	Average
2 - 5	Low	Average	High
> 5	Average	High	High

d) Convert ratings into UFC's.

Rating	Values				
	EO	EQ	EI	ILF	ELF
Low	4	3	3	7	5
Average	5	4	4	10	7
High	6	5	6	15	10

3) Compute value adjustment factor (VAF) based on 14 general system characteristics (GSC)

General System Characteristic		Brief Description
GSC 1	Data communications	How many communication facilities are there to aid in the transfer or exchange of information with the application or system?
GSC 2	Distributed data processing	How are distributed data and processing functions handled?
GSC 3	Performance	Was response time or throughput required by the user?
GSC 4	Heavily used configuration	How heavily used is the current hardware platform where the application will be executed?
GSC 5	Transaction rate	How frequently are transactions executed daily, weekly, monthly, etc.?
GSC 6	On-Line data entry	What percentage of the information is entered On-Line?
GSC 7	End-user efficiency	Was the application designed for end-user efficiency?
GSC 8	On-Line update	How many ILF's are updated by On-Line transaction?
GSC 9	Complex processing	Does the application have extensive logical or mathematical processing?
GSC 10	Reusability	Was the application developed to meet one or many user's needs?
GSC 11	Installation ease	How difficult is conversion and installation?
GSC 12	Operational ease	How effective and/or automated are start-up, back-up, and recovery procedures?
GSC 13	Multiple sites	Was the application specifically designed, developed, and supported to be installed at multiple sites for multiple organizations?
GSC 14	Facilitate change	Was the application specifically designed, developed, and supported to facilitate change?

4) Weight each GSC on a scale of 0 to 5 based on whether it has no influence to strong influence.

5) Compute the FPC as follows.

$$FPC = UFC * (0.65 + (\text{sum}(\text{GSC}) * .01))$$
