Question 1)

You work for a software outsourcing company, and you received the following information below. Based on the requirements below, create two quotes/estimates using two methods.

- SLOC - 10,000
- Reused - 750 lines of code
- Integration 15%
- Assessment 3%
- Modified - 100
- Development Flexibility - Low

Each quote needs to include the following:

1. How many man hours?
2. How many developers?
3. How long will the project take?
4. How much will the project cost?
5. How do you know the numbers are correct?

Answer:

Quote 1: Using COCOMO II
COCOMO II is a popular software cost estimation model used for calculating the cost, effort, and time required to develop a software product.

Effort = a * (KLOC)^b * EAF
where a and b are constants, KLOC is the estimated size of the software in thousands of lines of code, and EAF is the product of the scale factors and cost drivers.

- a = 3.2
- b = 1.05
- EAF = 1.055

Plugging these values into the effort equation, we get:
Since sloc is 10,000 and 750 reused this would be equal to 10.75 kloc
Effort = 3.2 * (10.75)^1.05 * 1.055
Effort = 40.6 person-months

To calculate the project's duration, we use the following equation:

Duration = 3.67 * Effort^0.33
Duration = 3.67 * (40.6)^0.33
Duration = 10.7 months

To calculate the number of developers needed, we use the following equation:
Developers = Effort / Duration
Plugging in the effort and duration estimates from above, we get:
Developers = 40.6 / 10.7
Developers = 4

Avg developer monthly salary is
Project cost = 40.6 person-months * $6,000 per person-month
Project cost = $243,600

Using COCOMO II, we estimate the following for this project:

- Man hours: 40.6 person months
- Developers: 4 developers
- Project duration: 10.7 months
- Project cost: $243,600

Quote 2: Using Wideband Delphi
Wideband Delphi is an expert-based estimation method that involves a group of experts providing their opinions on the development effort.

For this quote, I will assume that the project will be developed by a team of three developers. The development flexibility is low, which means that the project requirements are well defined and there is little room for changes.
using the Wideband Delphi technique with three experts:
Effort estimate (in man-hours):

- Task breakdown and estimation: 96 hours
- Integration and assessment adjustment factor: 15%
- Total effort: 110.4 hours

Project duration:

- Number of developers: 3
- Total effort per developer: 36.8 hours
- Project duration: 10.8 days

Project cost:

- Hourly rate per developer: $80

- Total cost: $8,832

To ensure the accuracy of the estimate, I will review the estimates with the experts and make any necessary adjustments based on their feedback. Additionally, I will verify the hourly rates of the developers and adjust them based on market rates to ensure that the estimate is as accurate as possible.