Department of Computer Engineering

Academic Term: First Term 2023-24

Class: T.E /Computer Sem – V / Software Engineering

Practical No:	**5**
Title:	**Estimating project cost using the COCOMO Model**
Date of Performance:	06/09/2023
Roll No:	9614
Team Members:	Mudabbir(9589),Muhammad(9588),Nathan(9597)

Rubrics for Evaluation:

Sr. No	Performance Indicator	Excellent	Good	Below Average	Total Score
1	On-time Completion & Submission (01)	01 (On Time)	NA	00 (Not on Time)	
2	Theory Understanding(02)	02(Correct)	NA	01 (Tried)	
3	Content Quality (03)	03(All used)	02 (Partial)	01 (rarely followed)	
4	Post Lab Questions (04)	04(done well)	3 (Partially Correct)	2(submitted)	

Signature of the Teacher:

Department of Computer Engineering

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EXPERIMENT NUMBER 5

Estimating the project cost for developing a " Farming Helper Website" mobile application. This app is designed to assist modern farmers in optimizing their farming operations using advanced technology.

Project Scope: The "Farmer Helper" app aims to assist farmers in managing their agricultural activities. It will include features such as crop tracking, weather forecasts, pest and disease identification, market price information, and a community forum for farmers to exchange knowledge.

COCOMO Model: Given the project's scope, we'll use the Intermediate COCOMO mode to account for the complexity and project-specific factors.

Size of the Software: To estimate the size, we can use function points (FP). Let's assume that the "Farmer Helper" app has a size of 1,200 function points.

Step 4: Identify Project-Specific Factors For this estimate, we'll consider various project-specific factors:

- **Product Attributes**:
  - Required software reliability: Moderate (R_moderate) = 1.10
  - Complexity of the product: High (R_high) = 1.21

1. Product

	Description	*Very Low*	*Low*	*Nominal*	*High*	*Very High*	*Extra High*
RELY	Required software reliability	0.75	0.88	1.00	1.15	1.40	-
DATA	Database size	-	0.94	1.00	1.08	1.16	-
CPLX	Product complexity	0.70	0.85	1.00	1.15	1.30	1.65

- **Personal Attributes**:
  - Analyst capability: Good (R_analyst) = 0.85
  - Programmer capability: Very Good (R_programmer) = 0.88
  - Team cohesion: Moderate (R_team) = 1.05

3. Personnel

	Description	Very Low	Low	Nominal	High	Very High	Extra High
ACAP	Analyst capability	1.46	1.19	1.00	0.86	0.71	-
AEXP	Applications experience	1.29	1.13	1.00	0.91	0.82	-
PCAP	Programmer capability	1.42	1.17	1.00	0.86	0.70	-
VEXP	Virtual machine experience	1.21	1.10	1.00	0.90	-	-
LEXP	Language experience	1.14	1.07	1.00	0.95	-	-

- **Project Attributes**:
  - Development flexibility: High (R_flex) = 1.15
  - Risk management: Moderate (R_moderate) = 1.10
  - Process maturity: Moderate (R_moderate) = 1.10

4. Project

	Description	Very Low	Low	Nominal	High	Very High	Extra High
MODP	Modern programming practices	1.24	1.10	1.00	0.91	0.82	-
TOOL	Software Tools	1.24	1.10	1.00	0.91	0.83	-
SCED	Development Schedule	1.23	1.08	1.00	1.04	1.10	-

- **Platform Attributes**:
  - Database complexity: Moderate (R_moderate) = 1.10
  - Platform experience: Moderate (R_moderate) = 1.10

2. Platform

	Description	Very Low	Low	Nominal	High	Very High	Extra High
TIME	Execution time constraint	-	-	1.00	1.11	1.30	1.66
STOR	Main storage constraint	-	-	1.00	1.06	1.21	1.56
VIRT	Virtual machine volatility	-	0.87	1.00	1.15	1.30	-
TURN	Computer turnaround time	-	0.87	1.00	1.07	1.15	-

Step 5: Calculate Effort and Schedule We'll use the Intermediate COCOMO formulas for estimating effort (E) and schedule (S):

suss

```
Effort (E) = a * (Size)^b * ∏(Ri)
Schedule (S) = c * (Effort)^d
```

For a "semi-detached" project type, we'll use typical constants:

- `a` = 3.0
- `b` = 1.12
- `c` = 2.5
- `d` = 0.35

Calculate `∏(Ri)`:

suss
```
∏(Ri) = R_moderate * R_high * R_analyst * R_programmer * R_team * R_flex * R_moderate * R_moderate * R_moderate * R_moderate ∏(Ri) ≈ 1.10 * 1.21 * 0.85 * 0.88 * 1.05 * 1.15 * 1.10 * 1.10 * 1.10 * 1.10
∏(Ri) ≈ 1.92
```

Now, calculate Effort (E):

suss
```
Effort (E) = 3.0 * (1,200)^1.12 * 1.92
Effort (E) ≈ 5,149 Person-Months
```

Next, calculate Schedule (S):
suss
```
Schedule (S) = 2.5 * (5,149)^0.35
Schedule (S) ≈ 17.55 Months
```

Estimate Cost: Assuming your organization's cost per person-month is $7,000:

bash
```
Cost = Effort * Cost per Person-Month
Cost = 5,149 * $7,000
Cost ≈ $36,043,000
```

So, the estimated cost of developing the "Farmer Helper" app is approximately $36,043,000. Remember that this is a high-level estimate, and actual costs may vary based on many factors, including feature changes and market dynamics.

Conclusion:

Estimating the project cost for developing the "Farming Helper Website" mobile application is a crucial endeavor, considering its mission to empower modern farmers with advanced technological tools. The multifaceted nature of such an application, encompassing features

like crop management, real-time weather updates, and data analytics, necessitates a comprehensive analysis of development efforts, resource requirements, and potential complexities. Factors such as the app's functionality, platform compatibility, user interface intricacies, and integration with external services will play pivotal roles in determining the overall project cost. A meticulous cost estimation process will be instrumental in ensuring that adequate resources are allocated to meet the app's objectives, providing farmers with a valuable tool to enhance their agricultural practices through technology.