Project Report: COCOMO Cost Estimation Tool

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Project :

Academic Project of Software Engineering (CSC_702)

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1. Project Overview

1.1 Project Name: COCOMO Cost Estimation Tool

1.2 Objective:
To design a **user-friendly software tool** that calculates **software development effort, duration, and staffing** using the **COCOMO model**. The tool provides a **GUI for input**, generates a **tabular result**, **graphs**, and a **well-structured DOCX report**.

1.3 Scope:

- Helps project managers estimate software development effort.
- Provides visualization of results.
- Generates professional reports for documentation and presentation.

1.4 Technologies Used:

Technology	Purpose
Python	Programming language
Tkinter	GUI framework
python-docx	DOCX report generation

Matplotlib	Graphical representation of outputs
Math library	Calculations
datetime	Timestamp in reports

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2. Abbreviations & Definitions

Abbreviation	Full Form	Description
KLOC	Thousand Lines of Code	Size of the software project in thousands of lines of code
EAF	Effort Adjustment Factor	Product of all cost driver multipliers
PM	Person-Month	Unit of effort (1 person working for 1 month)
COCOMO	Constructive Cost Model	Software cost estimation model developed by Barry Boehm
GUI	Graphical User Interface	Allows user-friendly interaction
Avg Staff	Average Staff	Average number of staff required during the project

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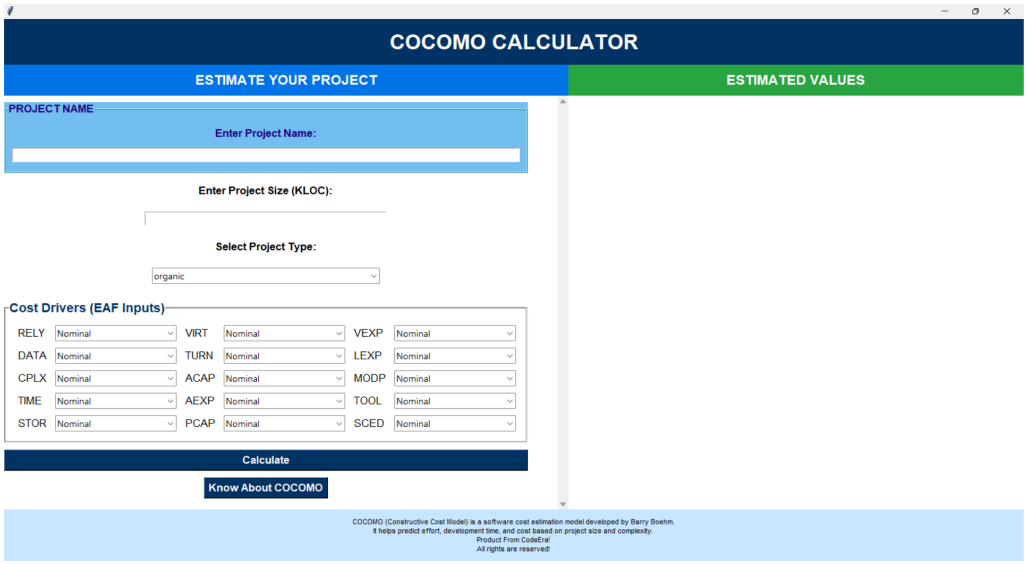
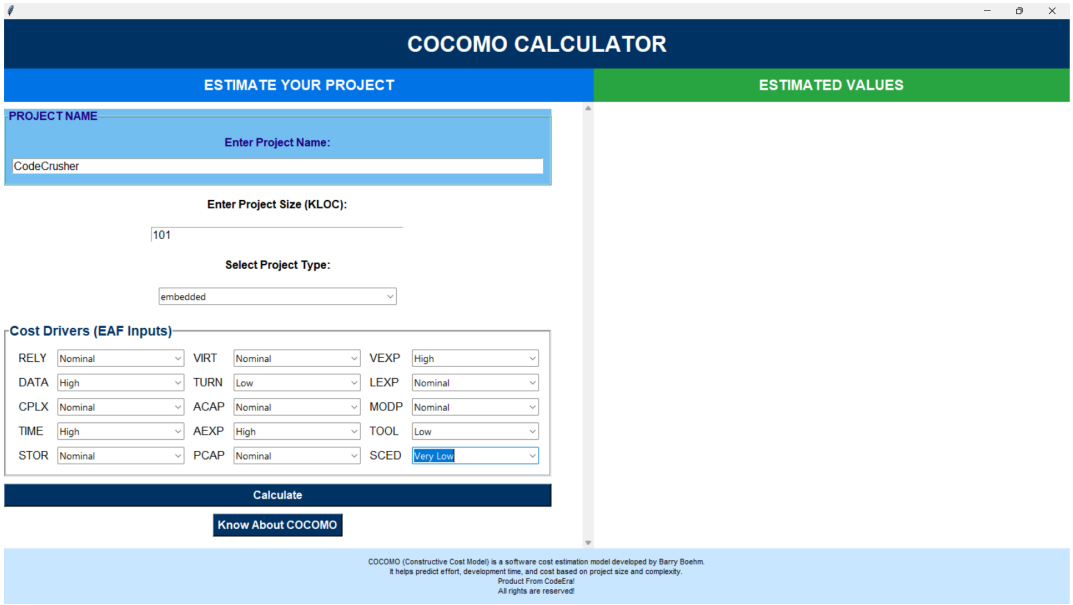
3. Software Flow & Screenshots

3.1 Application Launch



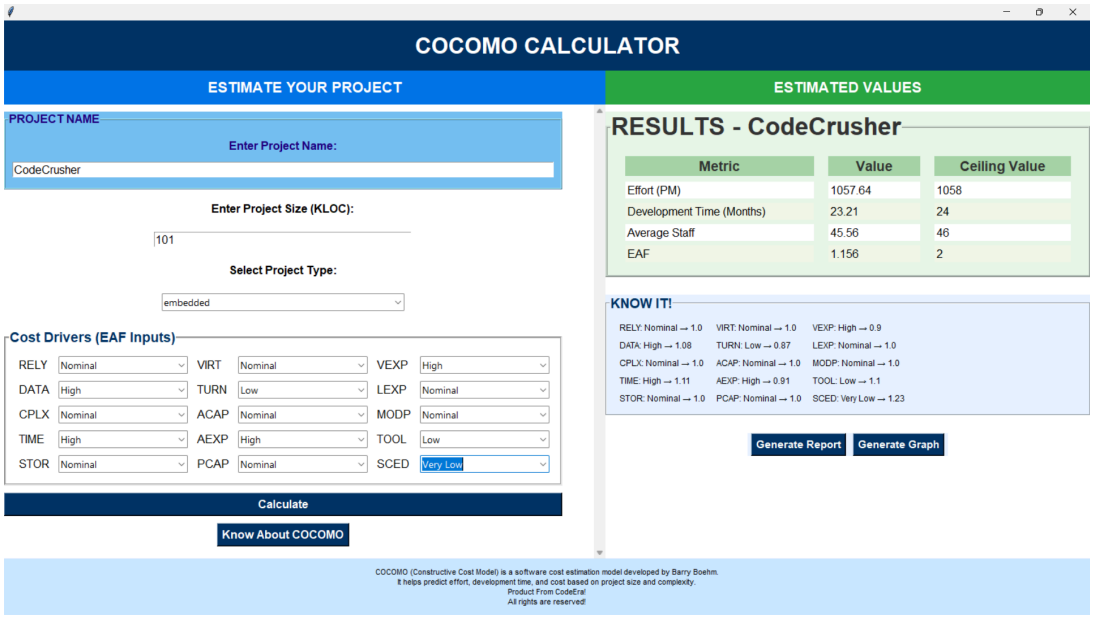
- The application initializes and opens in **fullscreen mode**.

3.2 Project Input Section



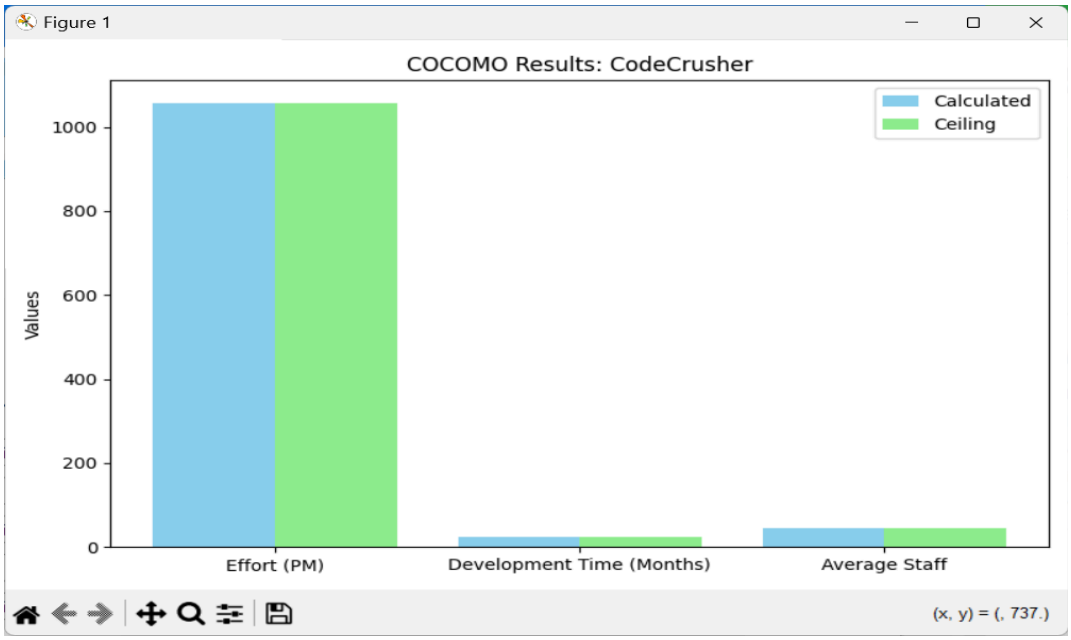
- Enter **Project Name**, **KLOC**, and select **Project Type** (organic, semi-detached, embedded).
- Select **Cost Driver values** for EAF calculation from dropdown menus.

3.3 Results Display



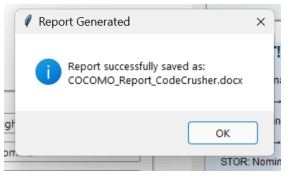
- Tabular display of **Effort (PM), Development Time, Average Staff**, and **EAF**.
- Color-coded rows for readability.

3.4 Graphical Representation



Graph shows **Effort, Duration, and Average Staff** for quick visualization.

3.5 DOCX Report Generation



COCOMO Report: CodeCrusher

Date & Time: 18-08-2025 07:06:24

PROJECT INFORMATION

Project Name: CodeCrusher

Type of Project: embedded

KLOC: 101.0

Coefficients Used:

A = 3.6, B = 1.2, C = 2.5, D = 0.32

OUTPUTS

Metric	Calculated	Ceiling Value
Effort (PM)	1057.64	1058
Development Time (Months)	23.21	24
Average Staff	45.56	46

Formulas Used:

Effort = A * (KLOC ^ B) * EAF = 3.6 * (101.0 ^ 1.2) * EAF

Duration = C * (Effort ^ D) = 2.5 * (Effort ^ 0.32)

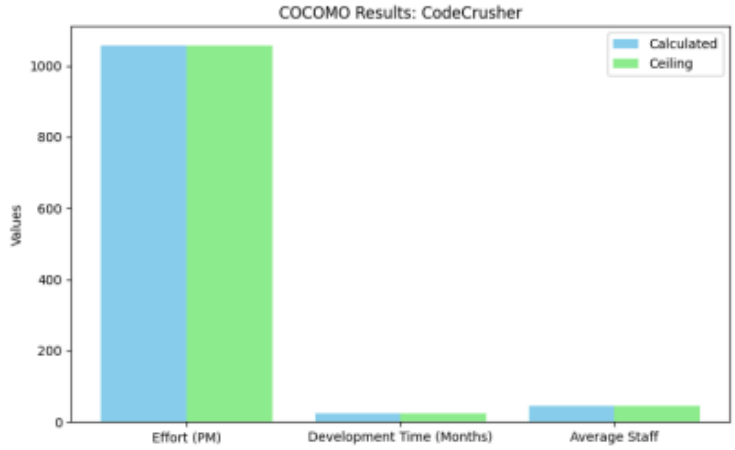
Staff = Effort / Duration

Summary: The project requires approximately 1058 person-months, with an estimated duration of 24 months and average staffing of 46 persons.

COST DRIVERS (EAF)

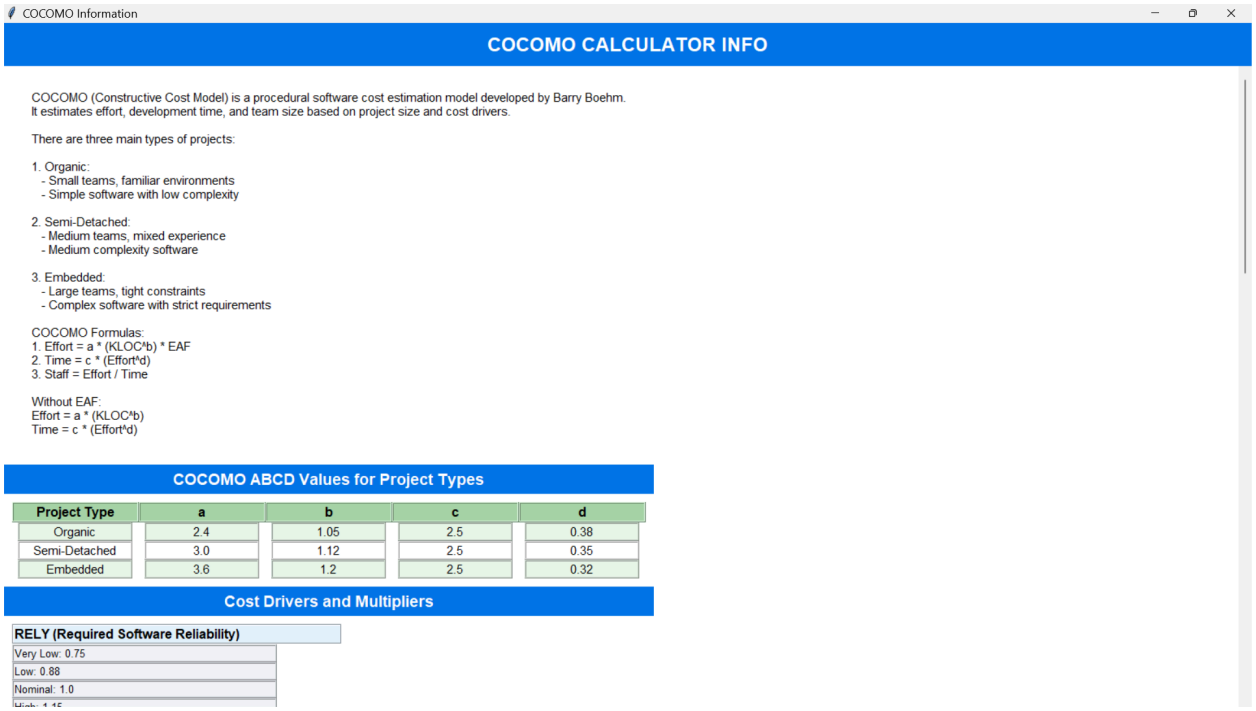
Cost Driver	Multiplier Value
RELY	1.0
DATA	1.08
CPLX	1.0
TIME	1.11
STOR	1.0
VIRT	1.0
TURN	0.87
ACAP	1.0
AEXP	0.91
PCAP	1.0
VEXP	0.9
LEXP	1.0
MODP	1.0
TOOL	1.1
SCED	1.23

Graphical Representation



- Generates a **well-structured report** with sections:
    - Project Information
    - Outputs Table
    - Cost Drivers (EAF)
    - Formulas
    - Summary
    - Graph (optional)

KNOW MORE ABOUT COCOMO



4. Project Information

Field	Value
Project Name	[CodeCrusher]
Type of Project	[Embedded]
KLOC	[101]
Coefficients Used	[A= 3.6, B= 1.2,C= 2.5, D= 0.32]
Date & Time	[18-08-2025 07:06:24]

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5. Outputs Table

Metric	Calculated Value	Ceiling Value
Effort (PM)	[1057.64]	1058
Development Time (Months)	[23.21]	24
Average Staff	[45.56]	46
EAF	[1.155]	2

Formulas Used:

- **Effort (PM) = A × (KLOC^B) × EAF**
- **Duration (Months) = C × (Effort^D)**
- **Average Staff = Effort / Duration**

Summary:

> The project requires approximately **[Effort] PM**, with an estimated duration of **[Months]**, and average staffing of **[Avg Staff] persons**.

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6. Cost Drivers (EAF Table)

S.No	Cost Driver	Selected Value	Multiplier
1	RELY	[value]	[multiplier]
2	DATA	[value]	[multiplier]
3	CPLX	[value]	[multiplier]
…	…	…	…
15	SCED	[value]	[multiplier]

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7. Step-by-Step Process

1. Launch the **GUI application** (fullscreen mode).
2. Enter **Project Name** and **KLOC**.
3. Select **Project Type**.
4. Set **Cost Driver ratings** using dropdown menus.
5. Click **Calculate** → results are displayed in **tabular form**.
6. Click **Generate Graph** (optional) to visualize results.
7. Click **Generate Report** → DOCX is generated with all **details and screenshots**.

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8. Future Scope

- Support for **multiple projects** in one report.
- Add **COCOMO II** model for **modern projects**.
- Include **Excel/CSV input** for bulk KLOC and cost drivers.
- Generate **interactive dashboards** with charts for multiple projects.