**Step 1: Select the Appropriate Project Mode**

COCOMO defines three types of project modes:  
1. Organic: Small, simple projects with well-understood requirements and a small team.  
2. Semi-Detached: Projects of medium size and complexity, where the team is somewhat experienced but not expert.  
3. Embedded: Large and complex projects that involve tight schedules, heavy regulations, and less flexibility in terms of design and resources.

# Step 2: Size of the Software

The size of the project is usually measured in KLOC (Kilo Source Lines of Code). You will need to estimate or know the size of your software in KLOC for the calculations.

# Step 3: Use the COCOMO Basic Formula

COCOMO uses the following formulas for calculating effort, development time, and staffing:  
1. \*\*Effort (E) Calculation\*\*: The formula for the effort in person-months (PM) is:  
 E = a \* (KLOC)^b  
 Where:  
 - E = Effort in person-months  
 - KLOC = Estimated size of the software in Kilo Source Lines of Code  
 - a and b are constants based on the project mode (Organic, Semi-Detached, or Embedded).  
  
2. \*\*Development Time (T) Calculation\*\*:   
 T = c \* (E)^d  
 Where:  
 - T = Development time in months  
 - E = Effort in person-months calculated earlier  
 - c and d are constants based on the project mode.  
  
3. \*\*Staffing (S) Calculation\*\*:   
 Staffing (S) is calculated as:  
 S = E / T  
 Where:  
 - S = Staffing in number of people

# COCOMO Constants

For each project mode (Organic, Semi-Detached, and Embedded), the values of the constants are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mode | a | b | c | d |
| Organic | 2.4 | 1.05 | 2.5 | 0.38 |
| Semi-Detached | 3.0 | 1.12 | 2.5 | 0.35 |
| Embedded | 3.6 | 1.2 | 2.5 | 0.32 |

# Step 4: Example Calculation

Let’s assume you have an estimated project size of 50 KLOC and you have selected the Semi-Detached project mode.

1. \*\*Effort (E)\*\*:  
 E = 3.0 \* (50)^{1.12} = 3.0 \* 136.33 = 409.0 person-months  
   
2. \*\*Development Time (T)\*\*:  
 T = 2.5 \* (409.0)^{0.35} = 2.5 \* 19.04 = 47.6 months  
   
3. \*\*Staffing (S)\*\*:  
 S = 409.0 / 47.6 = 8.6 people

# Summary for this Example

- \*\*Effort\*\*: 409 person-months  
- \*\*Development Time\*\*: 47.6 months  
- \*\*Staffing\*\*: 8.6 people