ALGORITHM:

Stopping Sight Distance (SSD)

Step 1: Start.

Step 2: Read input: Ask the user to enter Speed V in km/h.

Step 3: Read input: Ask user to enter reaction time t in seconds (typical 2.5 s if unknown).

Step 4: Read input: Ask user to enter coefficient of friction f (dimensionless).

Step 5:Read input: Ask user to enter grade G as a decimal (e.g., +0.02 for +2% uphill, −0.03 for −3% downhill).

Step 6: Validate inputs: Ensure $V \geq 0$, $t > 0$, $f > 0$. If invalid show error and stop.

Step 7: Compute lag (thinking) distance LD:
$LD = 0.278 \times V \times t$.

Step 8: Compute braking denominator:
$denom = 254 \times (f + G)$.
If $denom \leq 0$, show error (unsafe/invalid friction+grade) and stop.

Step 9: Compute braking distance BD:
$BD = (V \times V) / denom$.

Step 10: Compute SSD:
$SSD = LD + BD$.

Step 11: Output: Display LD, BD, SSD with units (meters).

Step 12: End.

Soil Bearing Capacity Checker —

Step 1: Start.

Step 2: Read input: Ask user to enter applied total vertical load P in kN.

Step 3: Read input: Ask the user to enter footing area A in m².

Step 4: Validate inputs: Ensure $P \geq 0$ and $A > 0$. If invalid show error and stop.

Step 5: Compute ultimate bearing pressure $q = P / A$ (kN/m²).

Step 6: Apply factor of safety (optional): If user supplies FS (typical 2.5 -- 3), compute allowable / safe bearing capacity SBC = q / FS. If no FS, assume SBC = q and note it is unfactored.

Step 7: Classify soil (example thresholds):
If SBC ≤ 100 kN/m² → “Weak soil”
If 100 < SBC ≤ 200 kN/m² → “Medium strength”
If SBC > 200 kN/m² → “Strong soil”
(Mention these are example thresholds — users may change them.)

Step 8: Output: Display q, SBC (if FS used), and classification. Include units (kN/m²).

Step 9: End.

Water Tank Volume Calculator — (Menu + two shapes)

Step 1: Start.

Step 2: Display menu:

1. Rectangular tank
2. Cylindrical tank

Step 3: Read input: User selects choice (1 or 2).

Step 4:Validate choice: If invalid show error and return to menu or stop.

If choice = 1 (Rectangular):
5. Read length L (m).
6. Read width W (m).
7. Read height H (m).
8. Validate L>0, W>0, H>0 — if not, show error and stop.
9. Compute Volume V = L × W × H (m³).
10. Optionally compute litres = V × 1000.
11. Display V (m³) and litres.
12. End.

If choice = 2 (Cylindrical):
5. Read radius r (m) or diameter d (m). If diameter given, set r = d/2.
6. Read height h (m).
7. Validate r>0 and h>0 — if not, show error and stop.
8. Compute Volume V = π × r² × h (use π = 3.14159265).
9. Optionally compute litres = V × 1000.
10. Display V (m³) and litres.
11. End.