

Flowchart & Algorithm of 1-35 **programs**

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Sem:- 1st Semester

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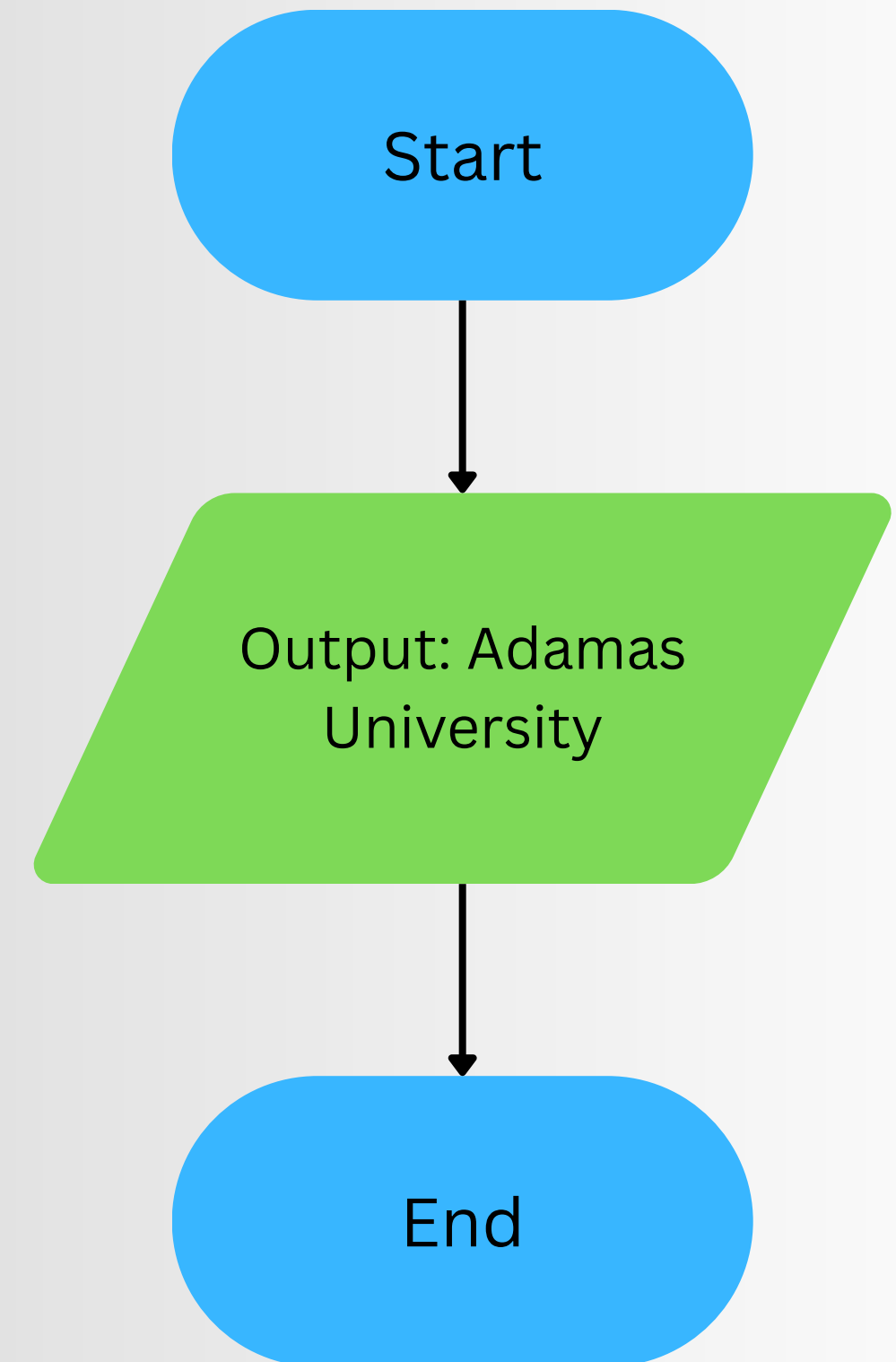
Reg nO:- AU/2025/0000162

Subject:- Introduction to Programming

Q1. Print Adamas University

Algorithm:-

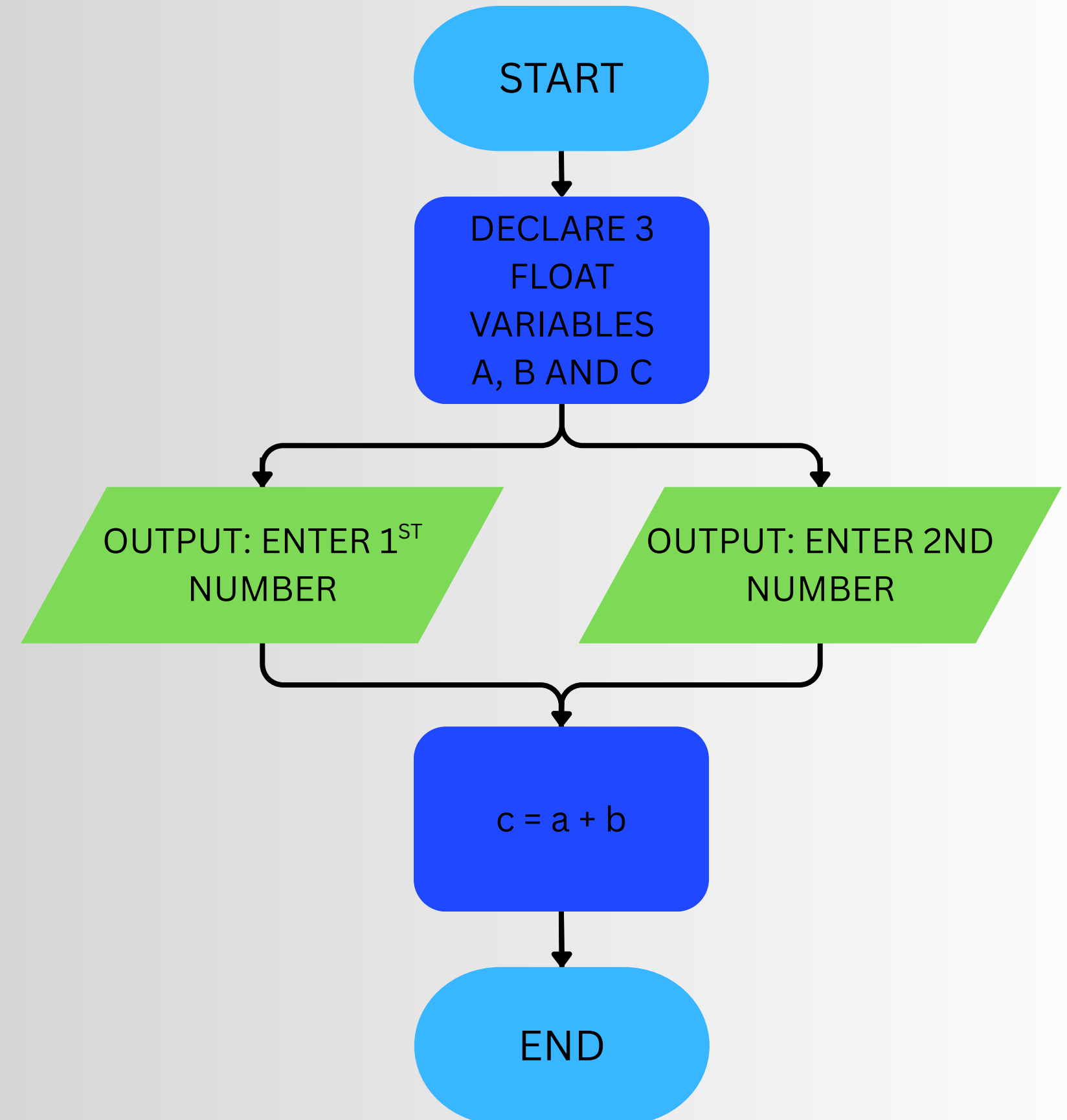
1. Start
2. Include the header file <stdio.h> to allow use of input/output functions.
3. Begin the main() function (program execution starts here).
4. Use the printf() function to display the text "Adamas University" on the screen.
5. Return 0 to indicate successful program execution.
6. End



Q2. Addition of 2 numbers

Algorithm:-

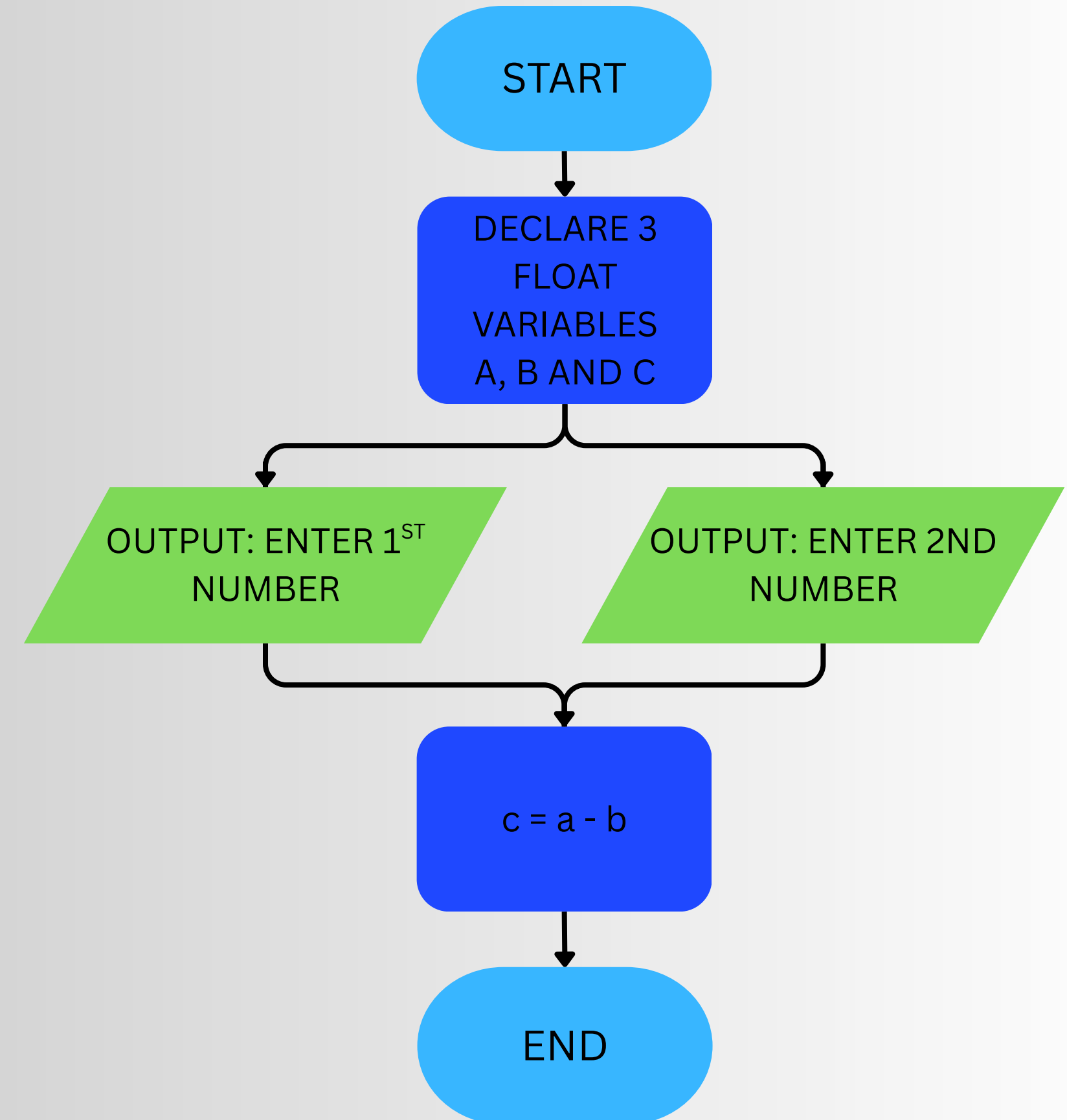
1. Start
2. Declare three variables a, b, and c of type float.
3. Display the message: "Enter two numbers:".
4. Read the values of a and b from the user.
5. Calculate the sum: $c = a + b$.
6. Display the result: "sum is : " followed by the value of c.
7. End



Q3. Difference of 2 numbers

Algorithm:-

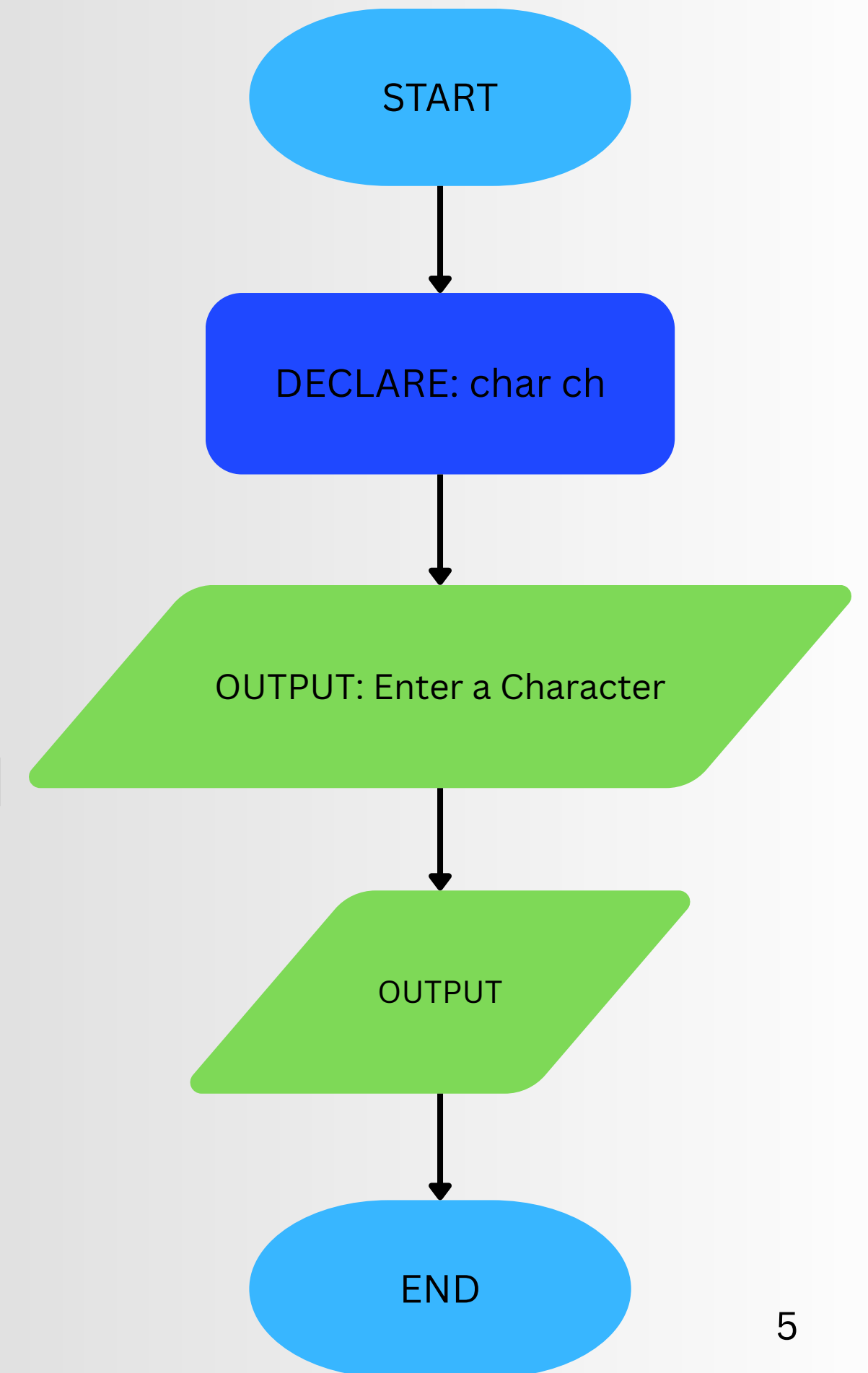
1. Start
2. Declare three variables a, b, and c of type float.
3. Display the message: "Enter two numbers:".
4. Read the values of a and b from the user.
5. Calculate the difference: $c = a - b$.
6. Display the result: "Difference is: " followed by the value of c.
7. End



Q4. ASCII of a character

Algorithm:-

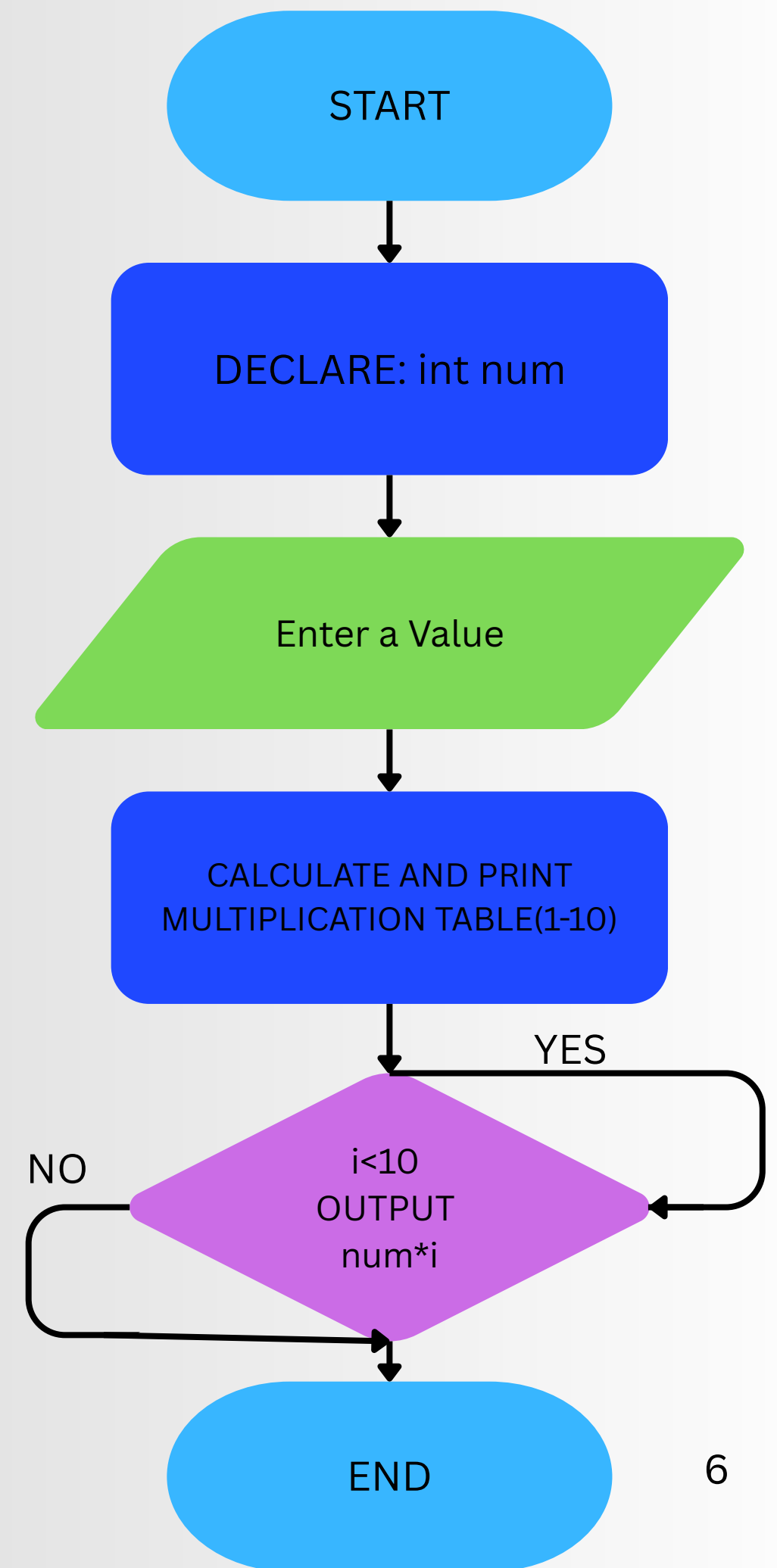
1. Start
2. Declare a variable c of type char.
3. Display the message: "Enter a character:".
4. Read a character from the user and store it in c.
5. Display the message: "The ASCII value is: " followed by the integer value of c.
6. End



Q5. Print Multiplication Table without using For loop

Algorithm:-

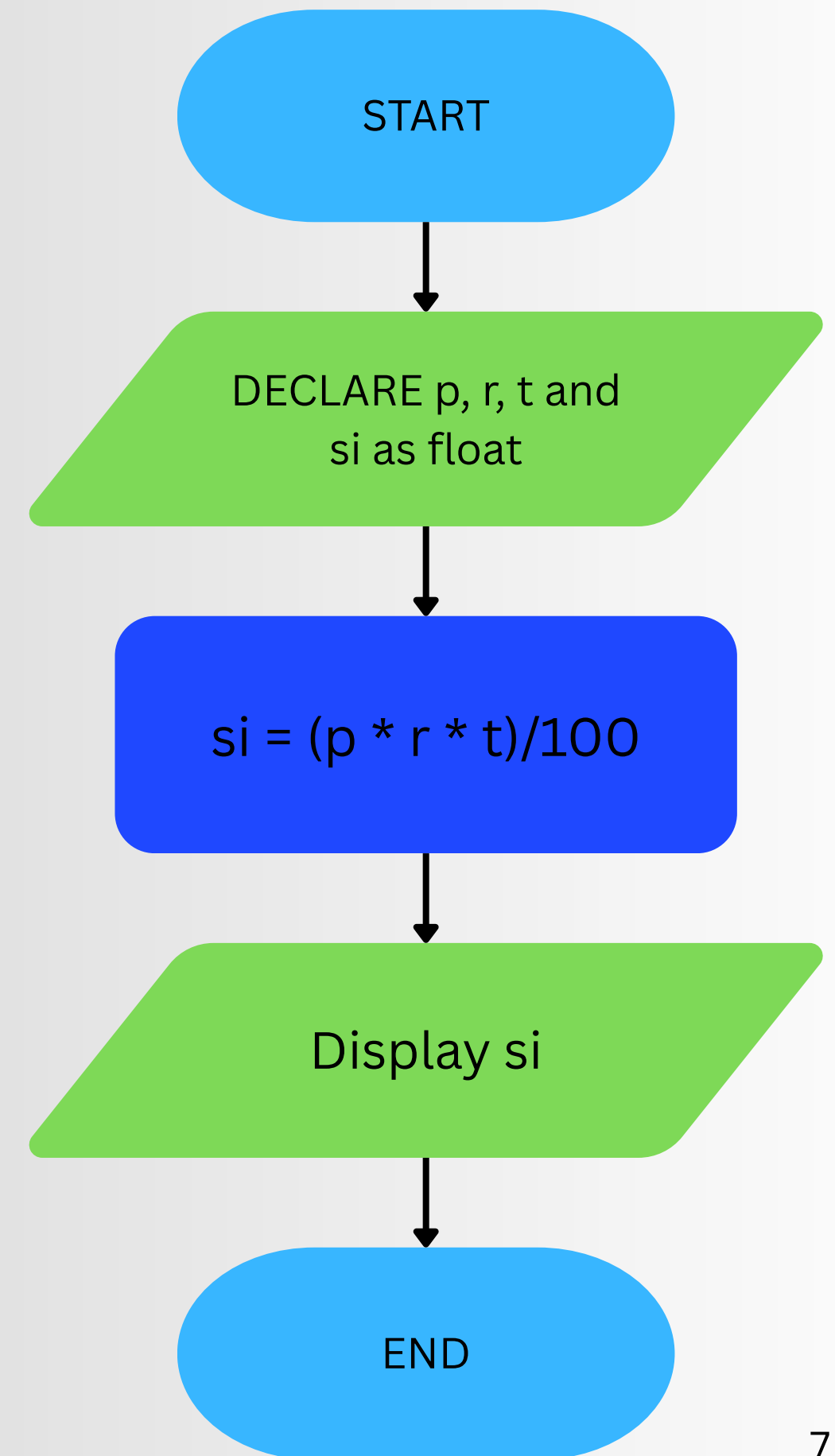
1. Start
2. Declare num = 5.
3. Print "Multiplication table of 5:".
4. Print each product from num*1 to num*10 manually.
5. End



Q6. Calculate Simple Interest

Algorithm:-

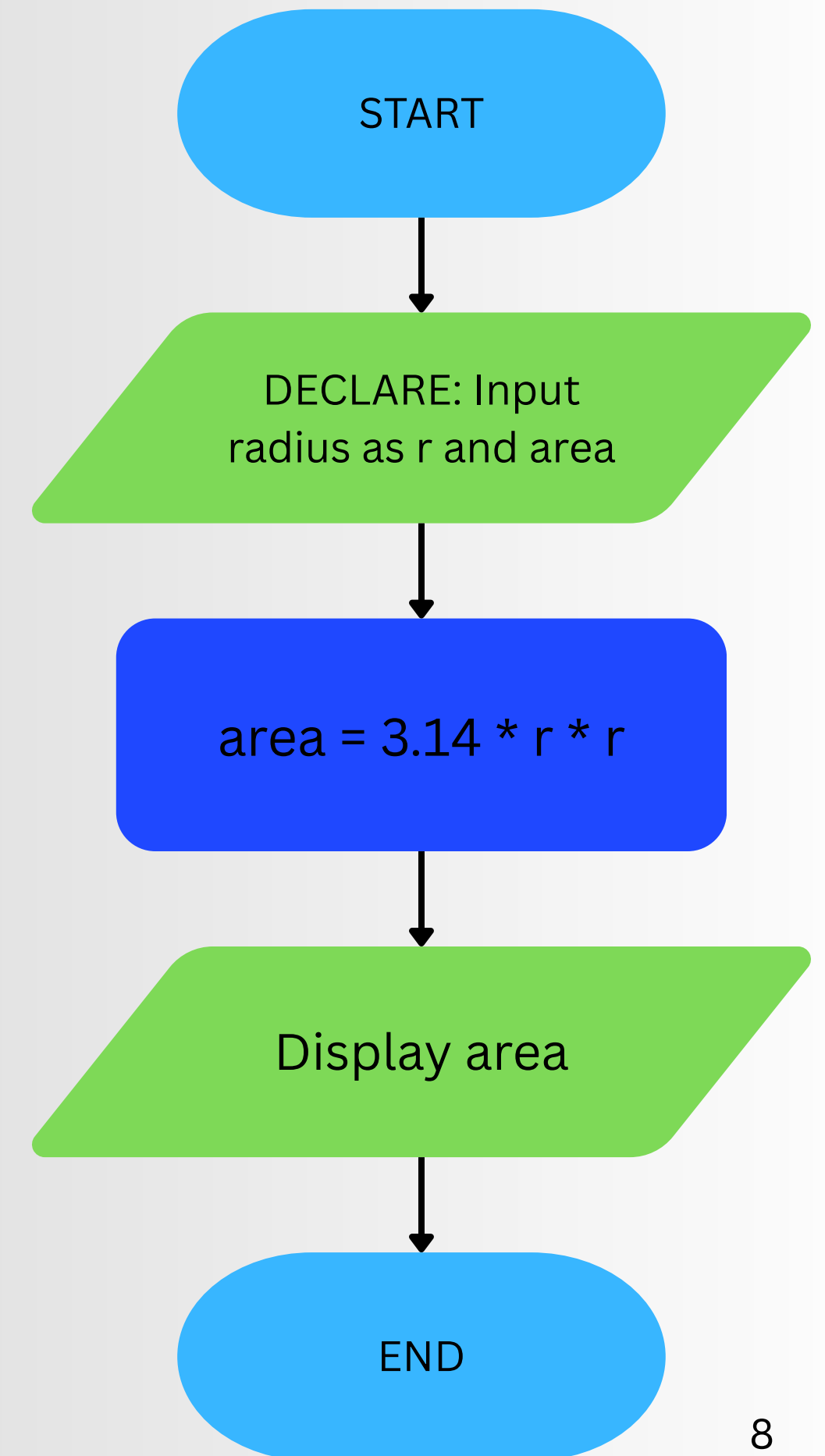
1. Start
2. Declare p, r, t, and si as float.
3. Prompt the user: "Enter principal, rate, and time:".
4. Read values of p, r, and t.
5. Calculate simple interest: $si = (p * r * t) / 100$.
6. Display "Simple Interest = " followed by si.
7. End



Q7. Calculate the area of a circle

Algorithm:-

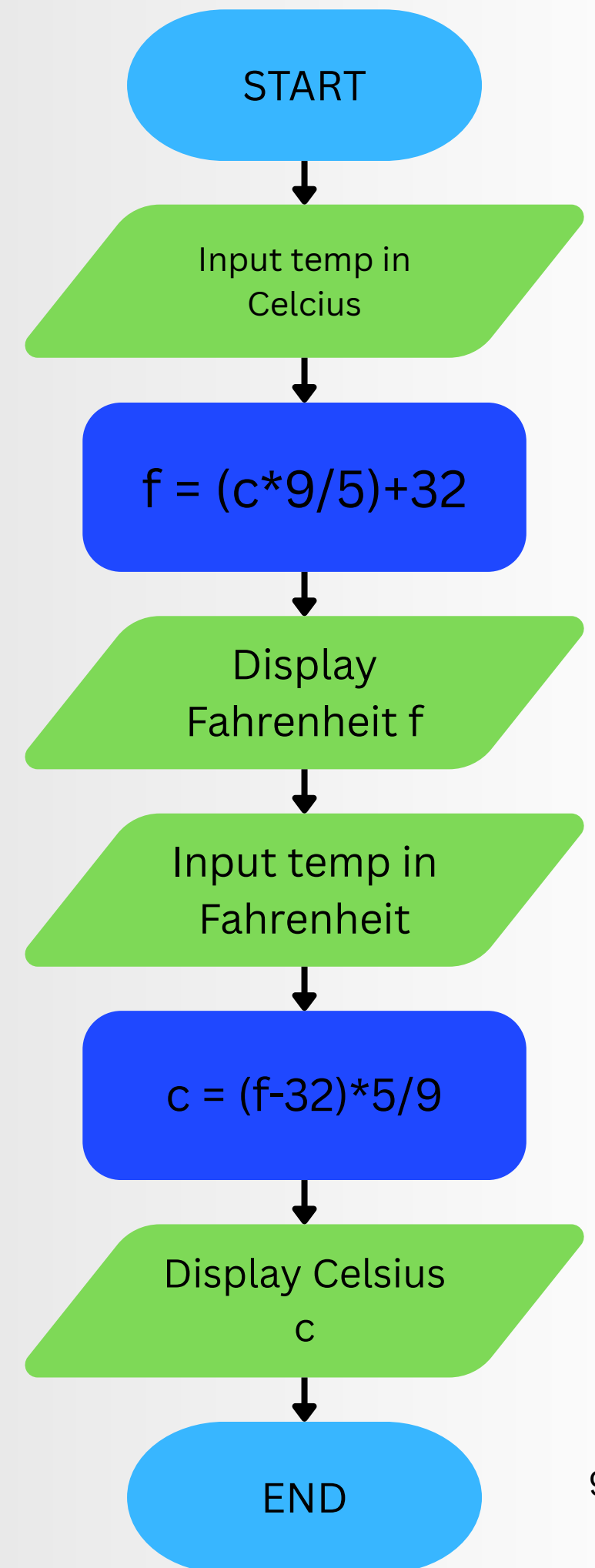
1. Start
2. Declare radius and area as float.
3. Prompt the user: "Enter the radius of the circle:".
4. Read the value of radius.
5. Calculate area: $\text{area} = 3.14 * \text{radius} * \text{radius}$.
6. Display "Area of the circle = " followed by area.
7. End



Q8. Convert temperatures between Celsius and Fahrenheit and display both conversions.

Algorithm:-

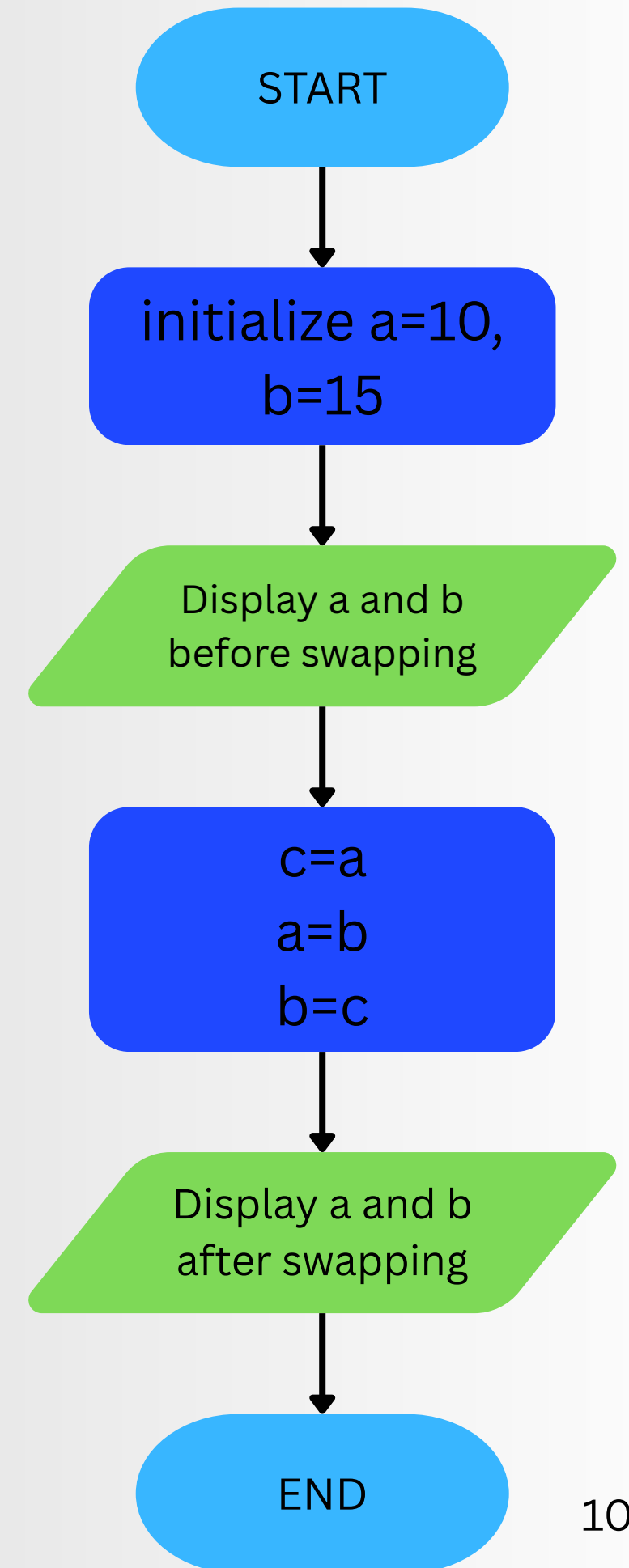
1. Start
2. Declare c, f, temp as float.
3. Prompt the user: "Enter temperature in Celsius:".
4. Read value of c.
5. Convert to Fahrenheit: $f = (c * 9 / 5) + 32$.
6. Display "Temperature in Fahrenheit = " followed by f.
7. Prompt the user: "Enter temperature in Fahrenheit:".
8. Read value of f.
9. Convert to Celsius: $c = (f - 32) * 5 / 9$.
10. Display "Temperature in Celsius = " followed by c.
11. End



Q9. Swapping 2 numbers using third variable

Algorithm:-

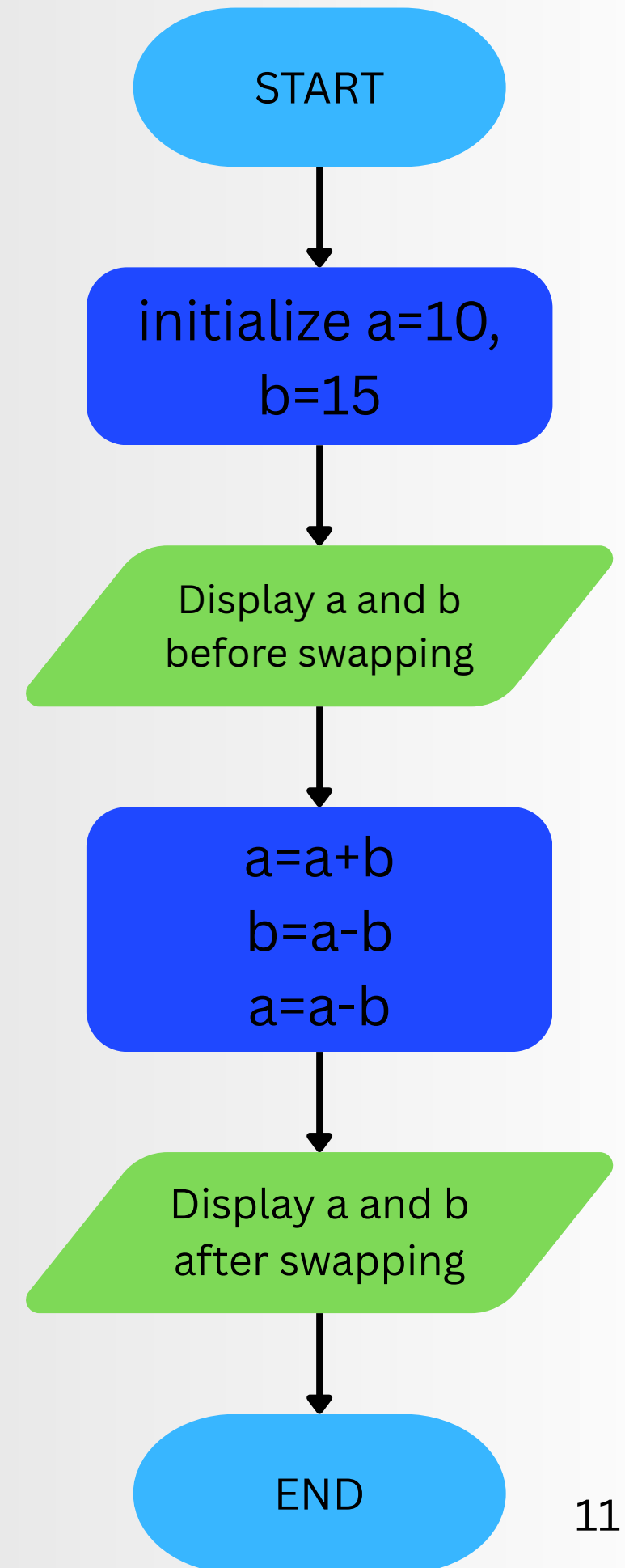
1. Start
2. Declare integers a, b, and c.
3. Initialize a = 10 and b = 15.
4. Display "Before swapping: a = 10, b = 15".
5. Store a in c.
6. Assign b to a.
7. Assign c to b.
8. Display "After swapping: a = 15, b = 10".
9. End



Q10. Swapping 2 numbers without using third variable

Algorithm:-

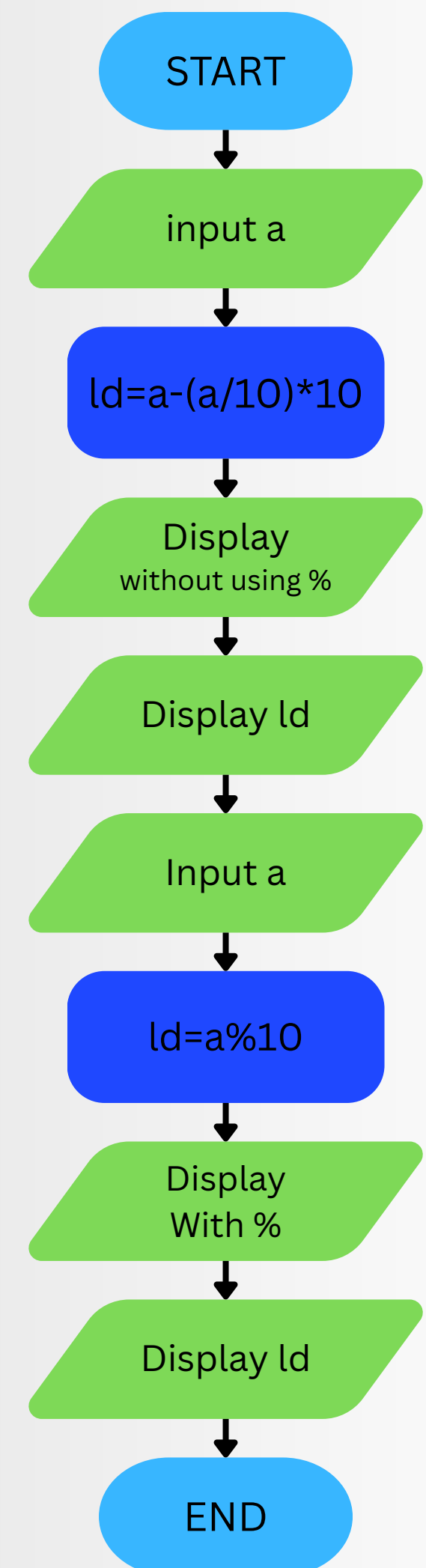
1. Start
2. Declare integers a and b.
3. Initialize a = 10 and b = 15.
4. Display "Before swapping: a = 10, b = 15".
5. Add a and b, store in a $\rightarrow a = a + b$.
6. Subtract new b from a, store in b $\rightarrow b = a - b$.
7. Subtract new b from a, store in a $\rightarrow a = a - b$.
8. Display "After swapping: a = 15, b = 10".
9. End



Q11. Display Last Digit with and without using the %

Algorithm:-

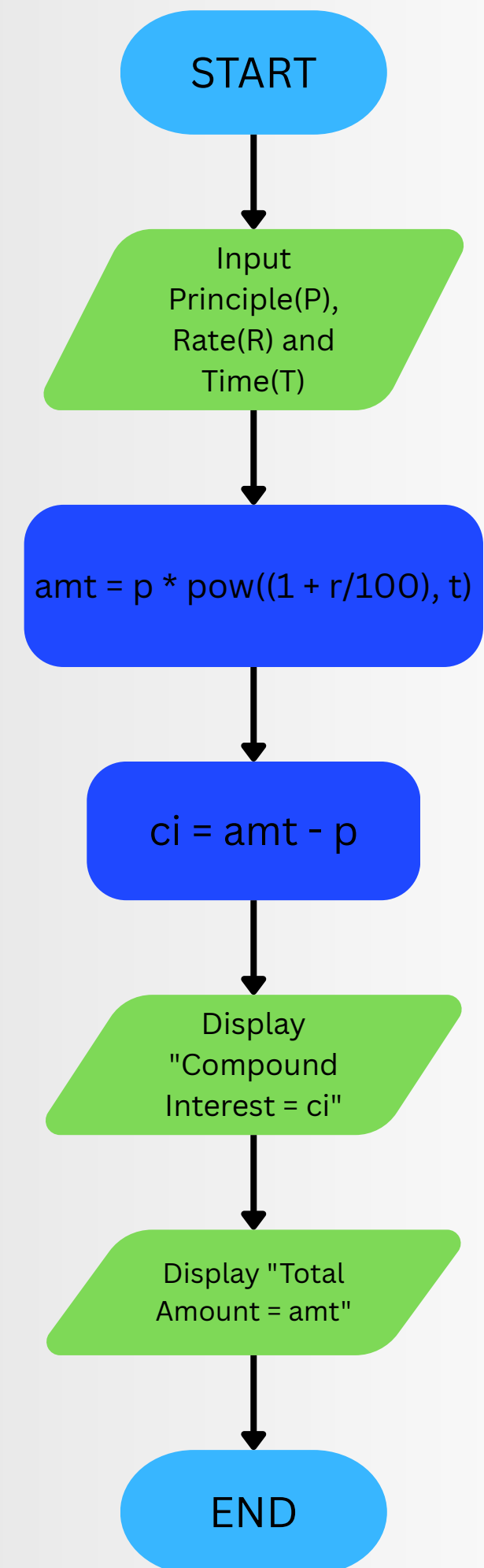
1. Start
2. Declare integers a and ld.
3. Prompt: "Enter the value of a:"
4. Read the value of a.
5. Find last digit without modulus: $ld = a - (a / 10) * 10$.
6. Display "Last digit (without modulus):" followed by ld.
7. Prompt: "Enter the value of a:" again.
8. Read the value of a.
9. Find last digit using modulus: $ld = a \% 10$.
10. Display "Last digit (using modulus):" followed by ld.
11. End



Q12. Calculate Compound Interest

Algorithm:-

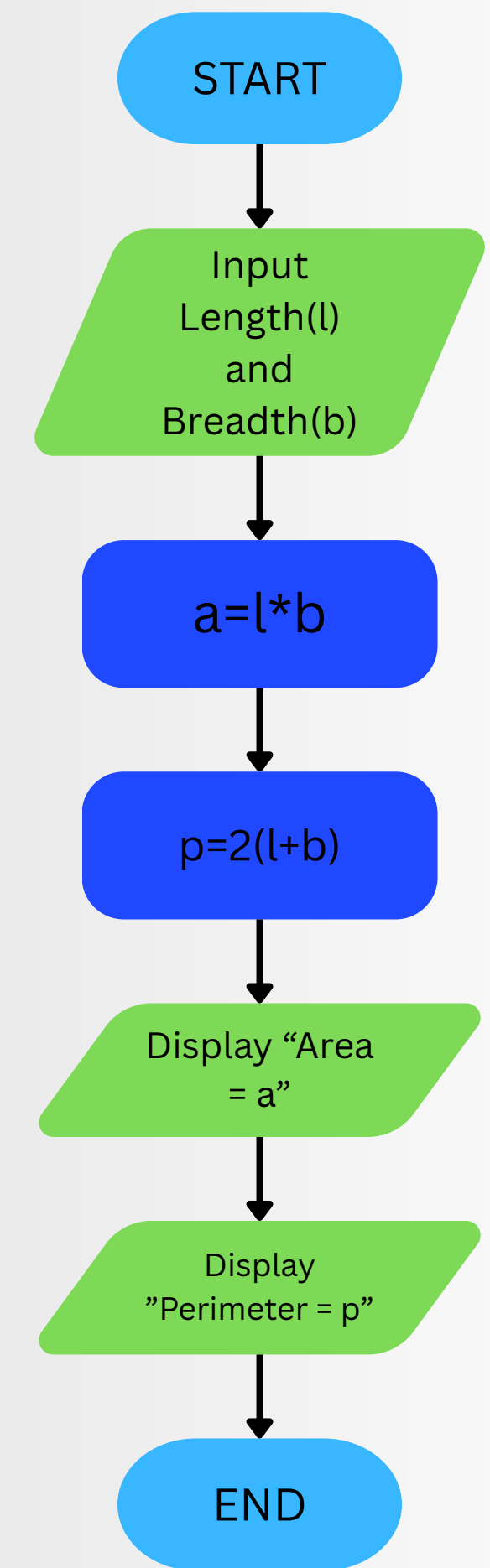
1. Start
2. Declare variables p, r, t, amt, and ci as double.
3. Prompt: "Enter Principle Amount:", read p.
4. Prompt: "Enter Rate:", read r.
5. Prompt: "Enter Time:", read t.
6. Calculate total amount: $\text{amt} = p * \text{pow}((1 + r / 100), t)$.
7. Calculate compound interest: $\text{ci} = \text{amt} - p$.
8. Display "Compound Interest =" followed by ci.
9. Display "Total Amount =" followed by amt.
10. End



Q13. Calculate Area and Perimeter of a Rectangle

Algorithm:-

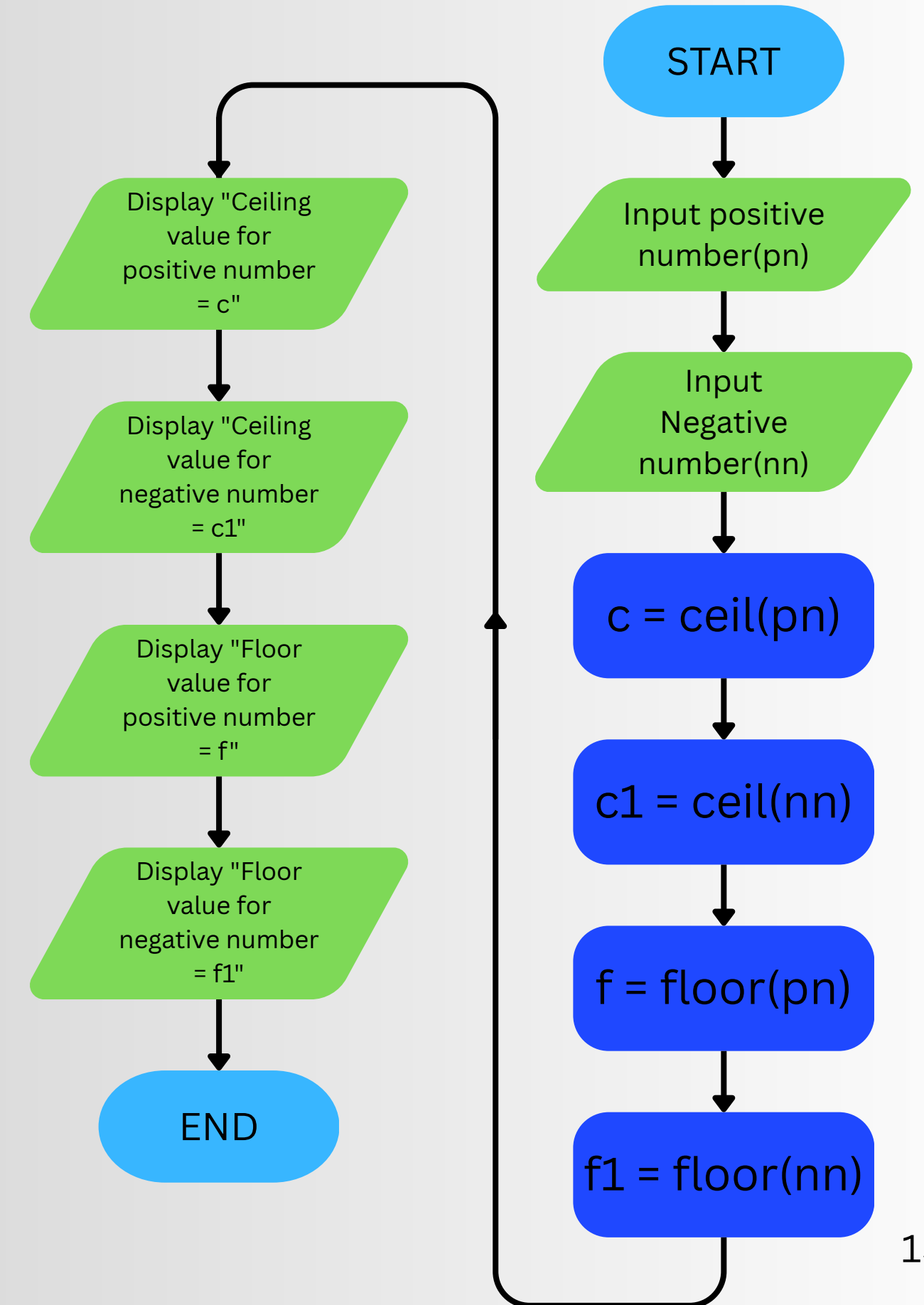
1. Start
2. Declare variables l, b, a, and p as float.
3. Prompt: "Enter the length of the Rectangle:", read l.
4. Prompt: "Enter the breadth of the Rectangle:", read b.
5. Calculate area: $a = l * b$.
6. Calculate perimeter: $p = 2 * (l + b)$.
7. Display "Area =" followed by a.
8. Display "Perimeter =" followed by p.
9. End



Q14. Print the Floor and Ceil of a number

Algorithm:-

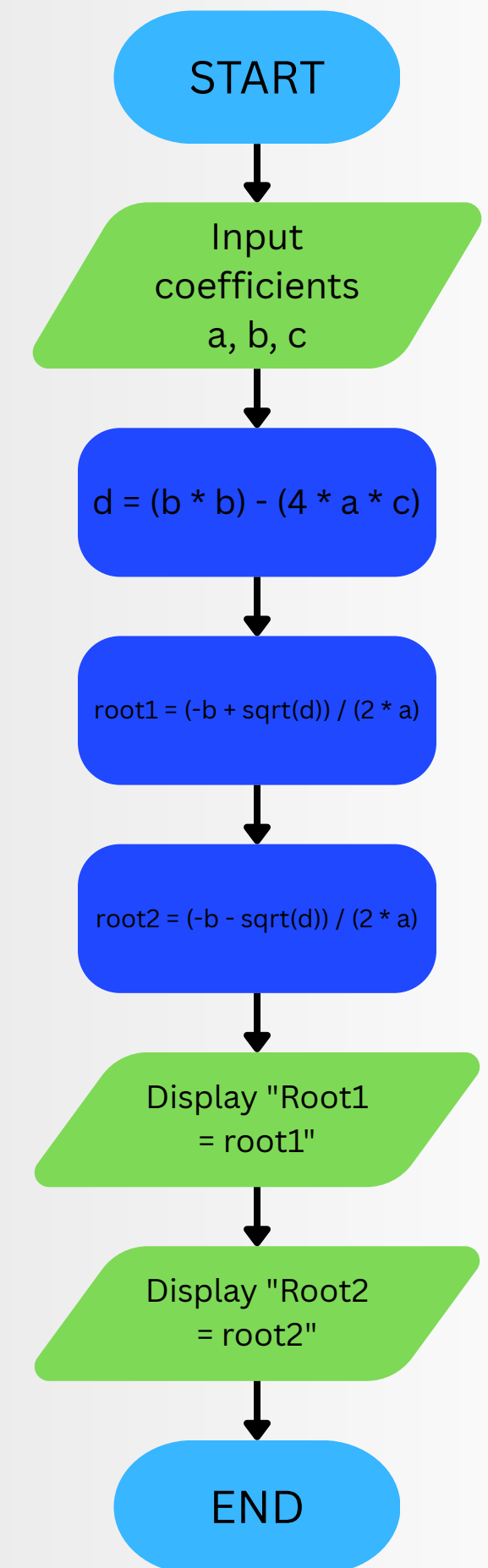
1. Start
2. Declare variables pn, nn, c, c1, f, f1 as float.
3. Prompt: "Enter a positive number:", read pn.
4. Prompt: "Enter a negative number:", read nn.
5. Calculate ceiling of positive: $c = \text{ceil}(pn)$.
6. Calculate ceiling of negative: $c1 = \text{ceil}(nn)$.
7. Calculate floor of positive: $f = \text{floor}(pn)$.
8. Calculate floor of negative: $f1 = \text{floor}(nn)$.
9. Display all four values (c, c1, f, f1).
10. End



Q15. Find the Roots of an Quadratic equation

Algorithm:-

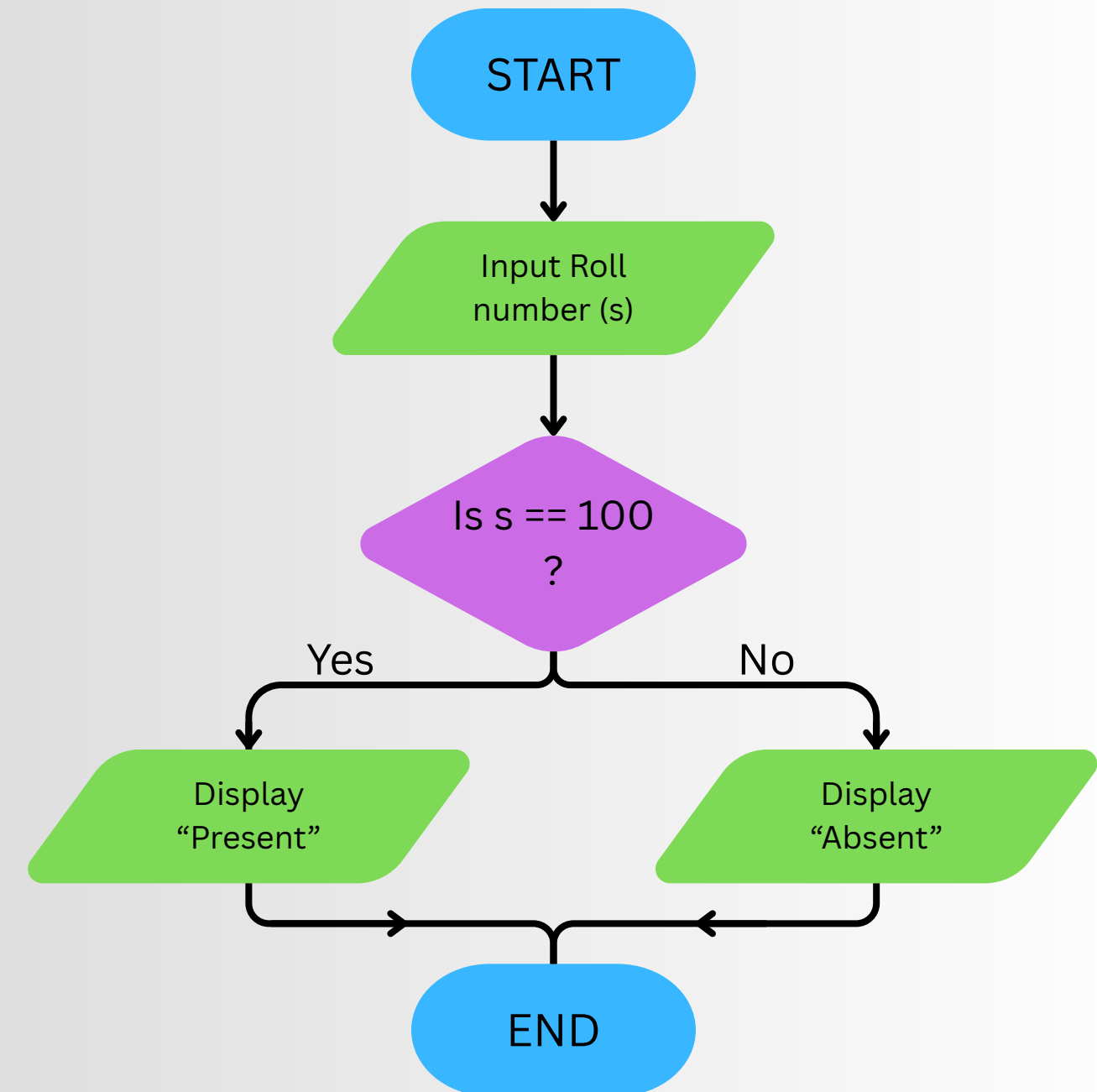
1. Start
2. Declare variables a, b, c, d, root1, and root2 as float.
3. Prompt: "Enter coefficients a, b and c:", read a, b, and c.
4. Calculate discriminant: $d = b * b - 4 * a * c$.
5. Calculate first root: $root1 = (-b + \sqrt{d}) / (2 * a)$.
6. Calculate second root: $root2 = (-b - \sqrt{d}) / (2 * a)$.
7. Display root1 and root2.
8. End



Q16. Check whether the student with a 100 roll no is absent or present

Algorithm:-

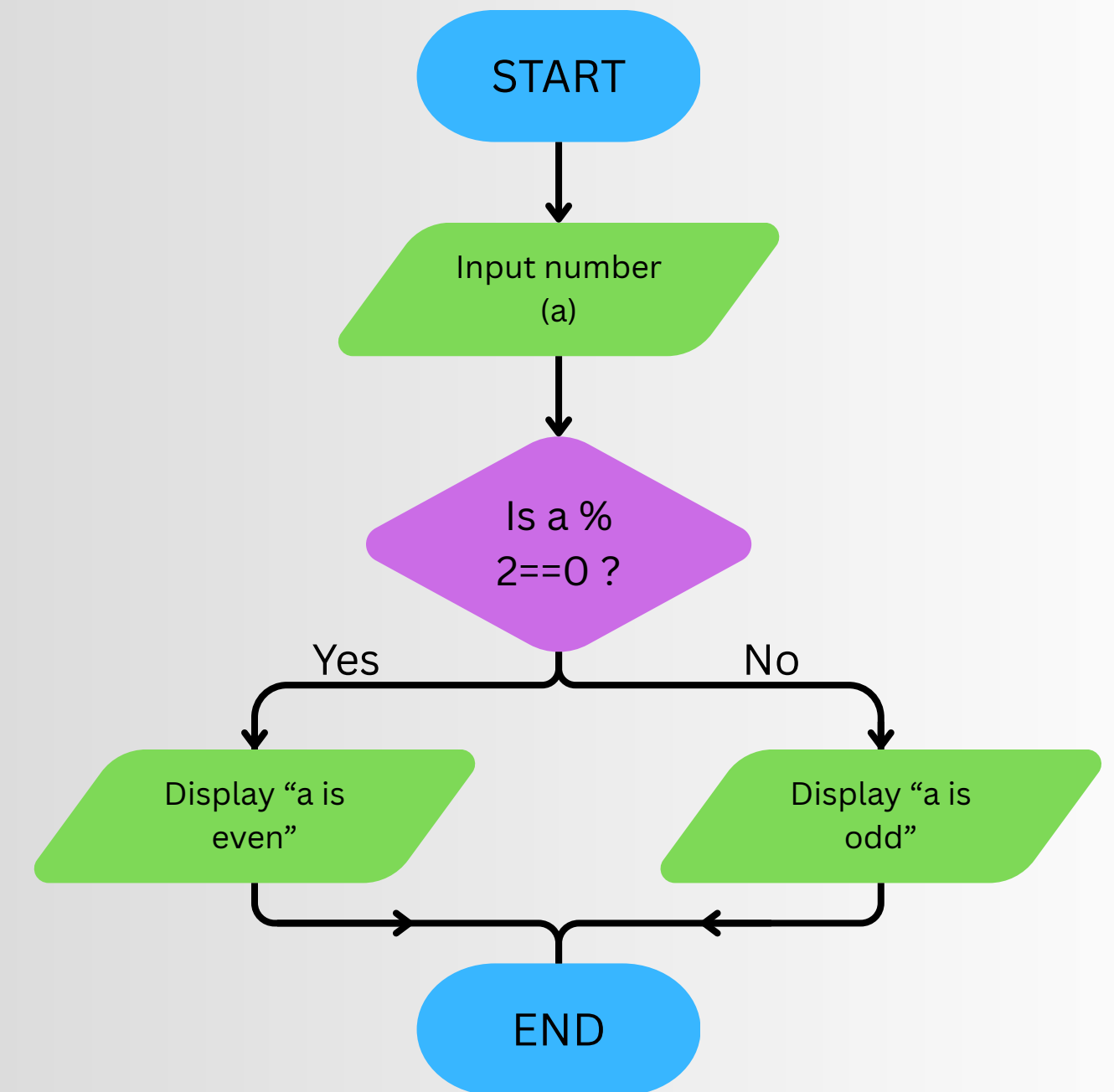
1. Start
2. Declare an integer variable s.
3. Prompt: "Enter the Roll number:", read s.
4. If $s == 100$, display "Present".
5. Else, display "Absent".
6. End



Q17. Check whether a number is odd or even

Algorithm:-

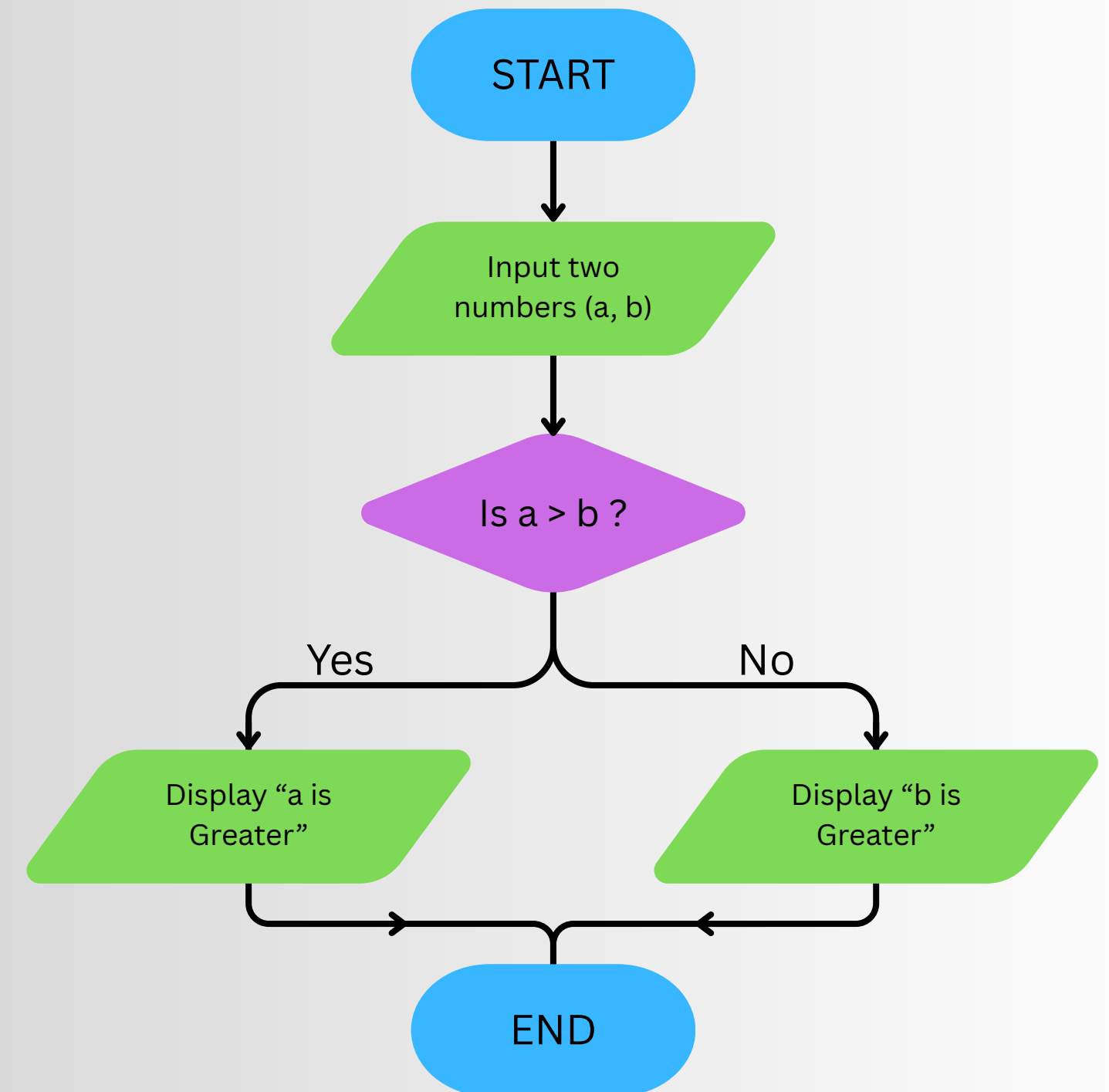
1. Start
2. Declare an integer variable a.
3. Prompt: "Enter any number:", read a.
4. If $a \% 2 == 0$, display a is Even.
5. Else, display a is Odd.
6. End



Q18. Find the greater among 2 numbers

Algorithm:-

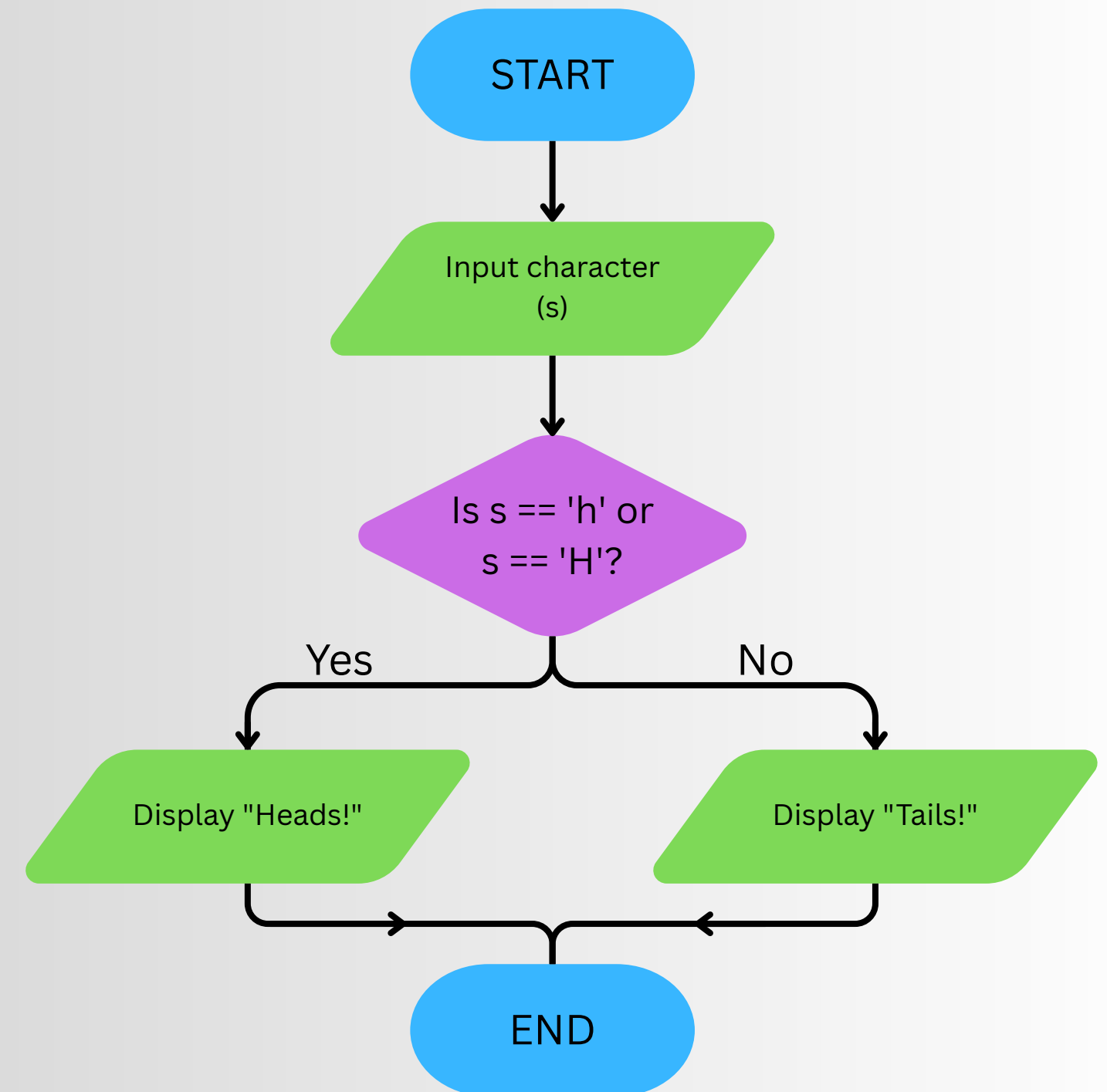
1. Start
2. Declare two integer variables a and b.
3. Prompt: "Enter two numbers:", read a and b.
4. If $a > b$, display a is Greater.
5. Else, display b is Greater.
6. End



Q19. Check for Heads or Tails

Algorithm:-

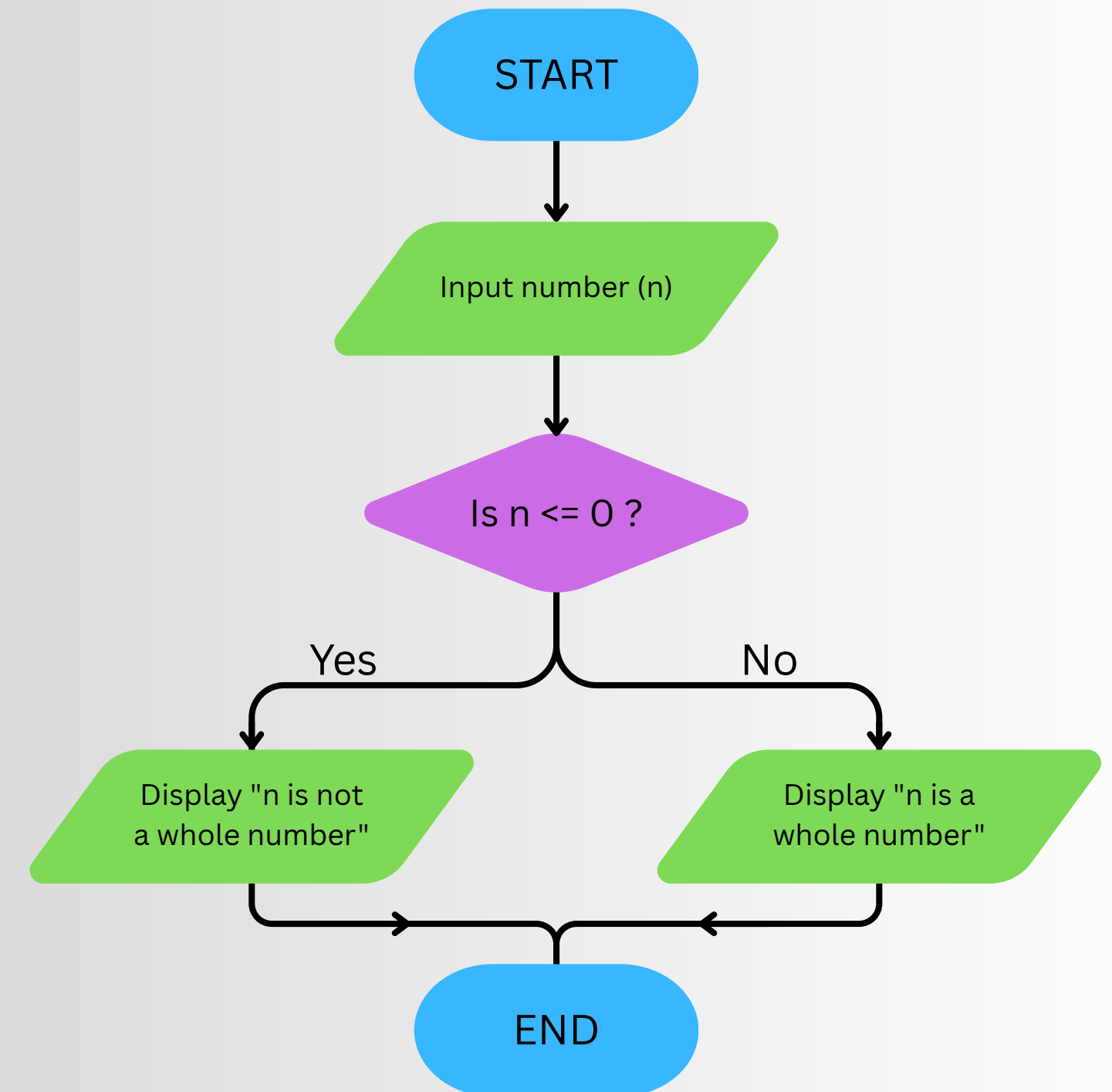
1. Start
2. Declare a character variable s.
3. Prompt: "Enter Head or Tails:", read s.
4. If $s == 'h'$ or $s == 'H'$, display "Heads!".
5. Else, display "Tails!".
6. End



Q20. Check whether a number is a whole number

Algorithm:-

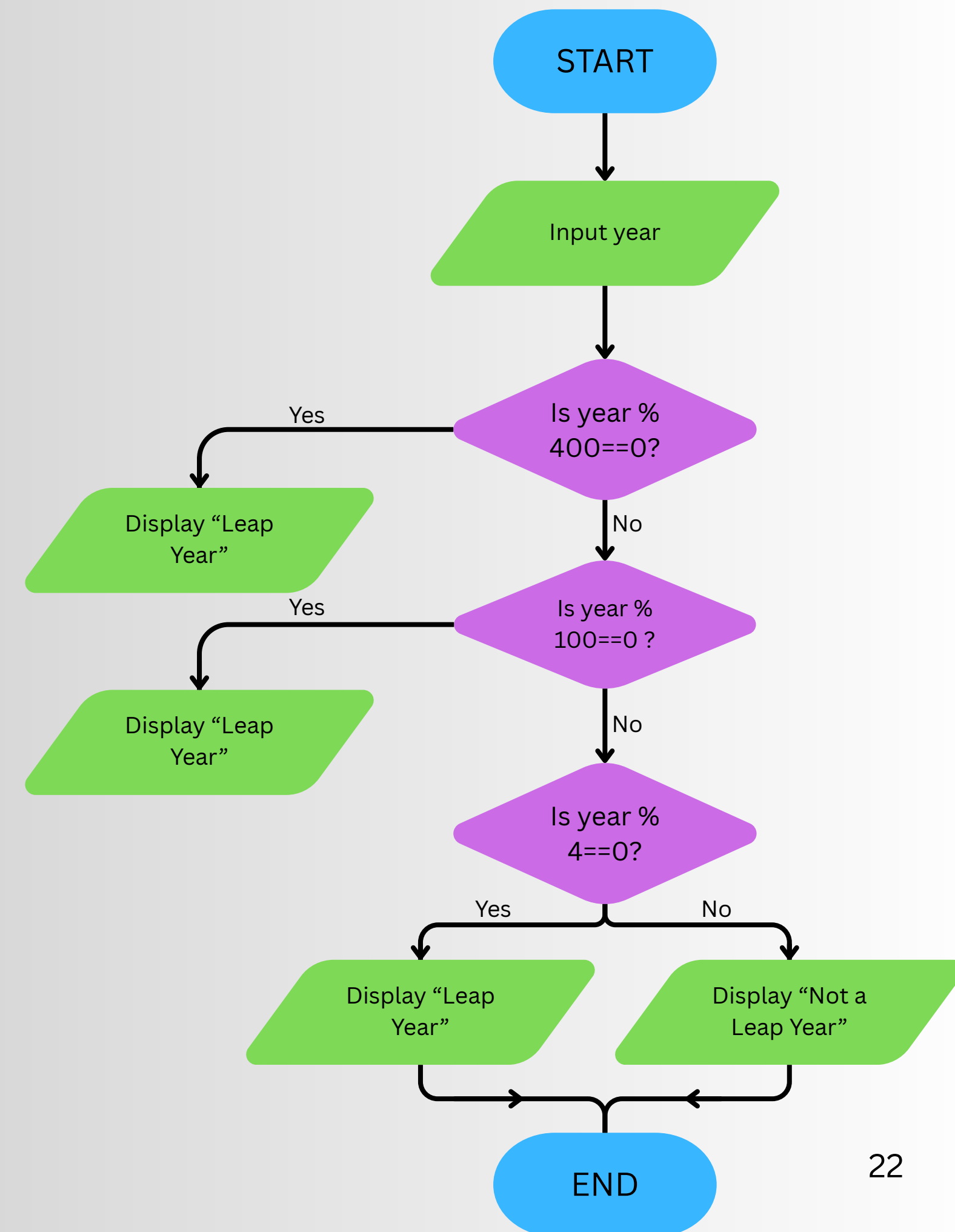
1. Start
2. Declare an integer variable n.
3. Prompt: "Enter a number:", read n.
4. If $n > 0$, display n is a whole number.
5. Else, display n is not a whole number.
6. End



Q21. Check whether a year is a leap year

Algorithm:-

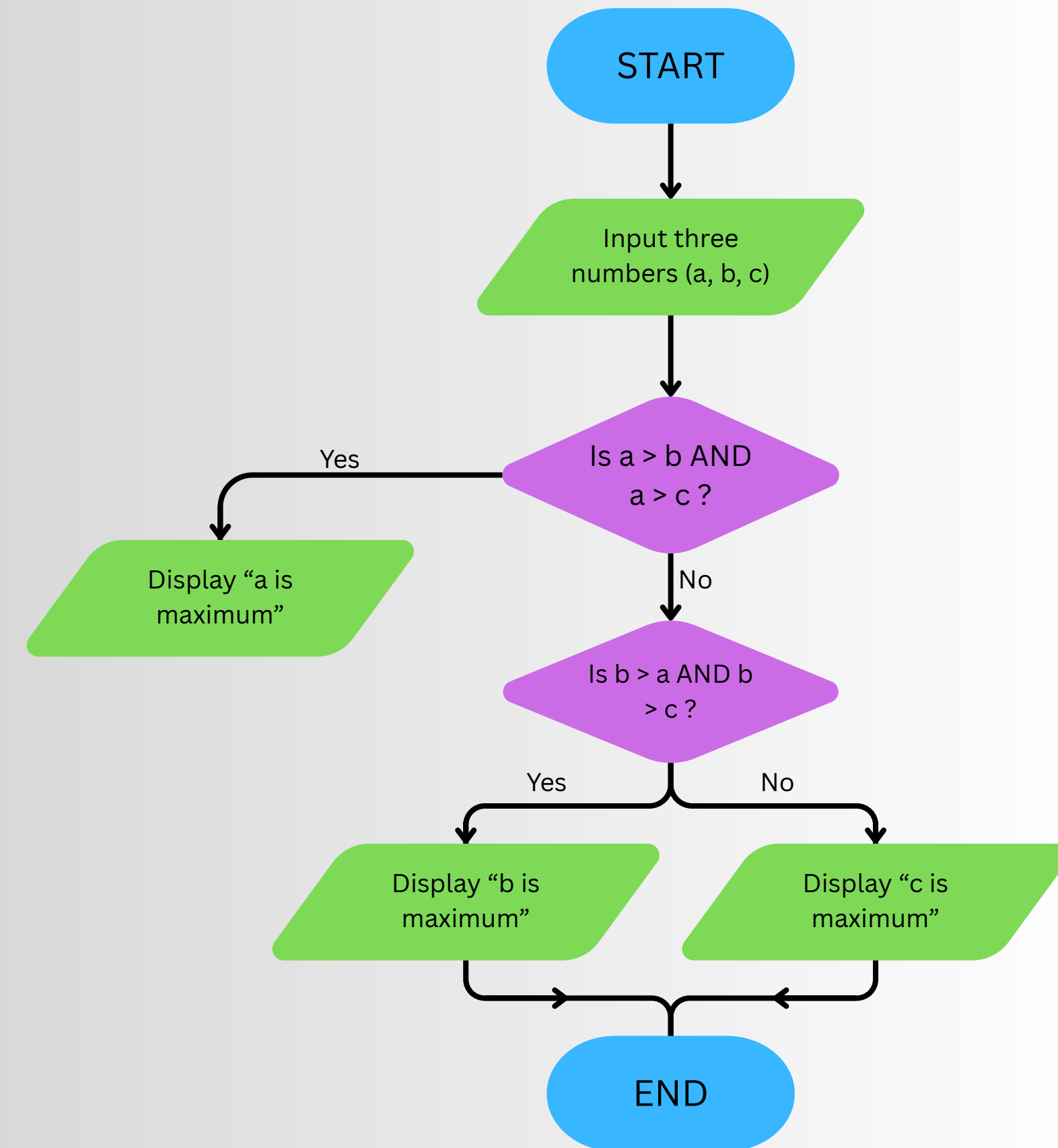
1. Start
2. Declare an integer variable year.
3. Prompt: "Enter a year:", read year.
4. If $\text{year} \% 400 == 0$, display "year is a leap year".
5. Else if $\text{year} \% 100 == 0$, display "year is not a leap year".
6. Else if $\text{year} \% 4 == 0$, display "year is a leap year".
7. Else, display "year is not a leap year".
8. End



Q22. Find the maximum among 3 numbers

Algorithm:-

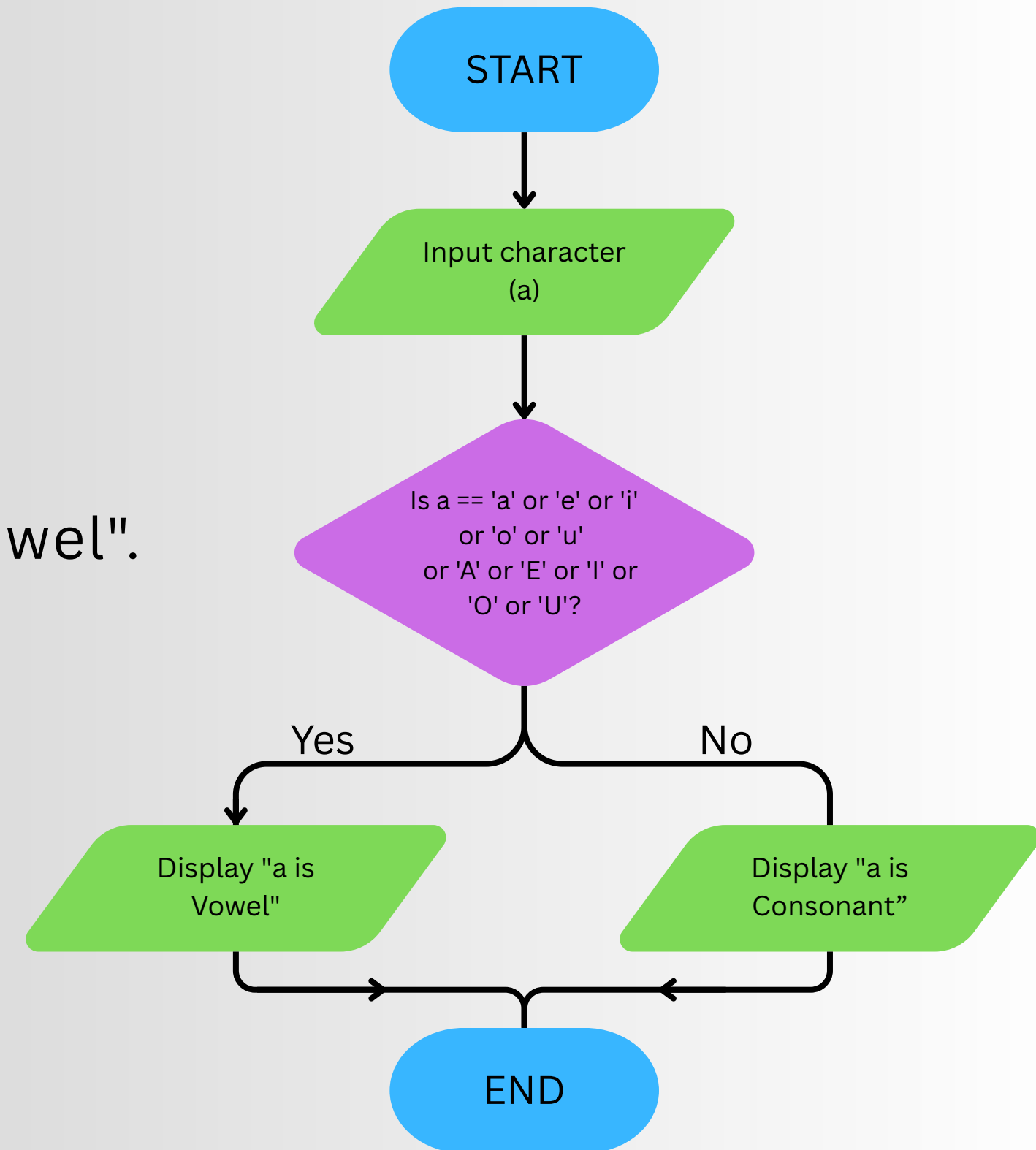
1. Start
2. Declare three integer variables a, b, and c.
3. Prompt: "Enter three numbers:", read a, b, and c.
4. If $a > b$ and $a > c$, display a is Maximum.
5. Else if $b > a$ and $b > c$, display b is Maximum.
6. Else, display c is Maximum.
7. End



Q23. Check whether a word is vowel or consonant

Algorithm:-

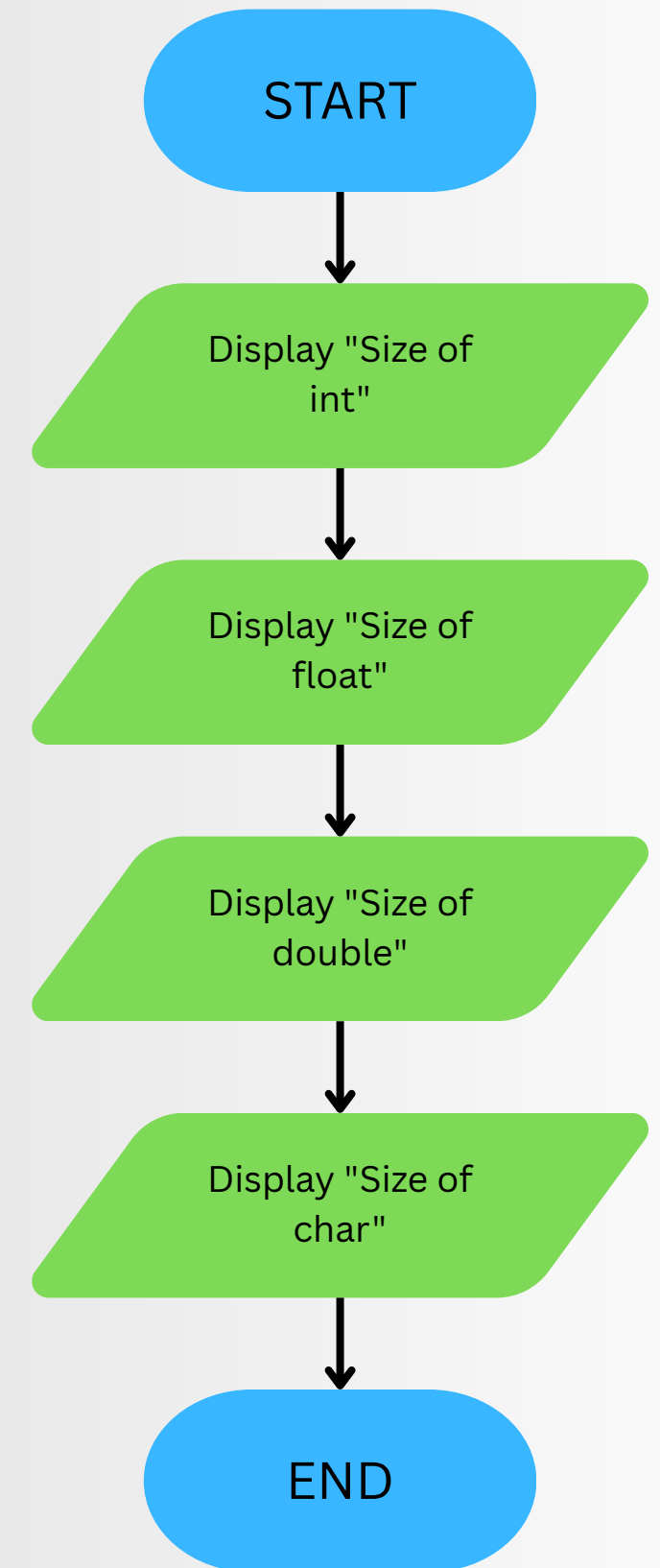
1. Start
2. Declare a character variable a.
3. Prompt: "Enter a character:", read a.
4. If a is 'a', 'e', 'i', 'o', 'u' (or uppercase), display "a is Vowel".
5. Else, display "a is a Consonant".
6. End



Q24. Find Sizes of Basic Data Types in C

Algorithm:-

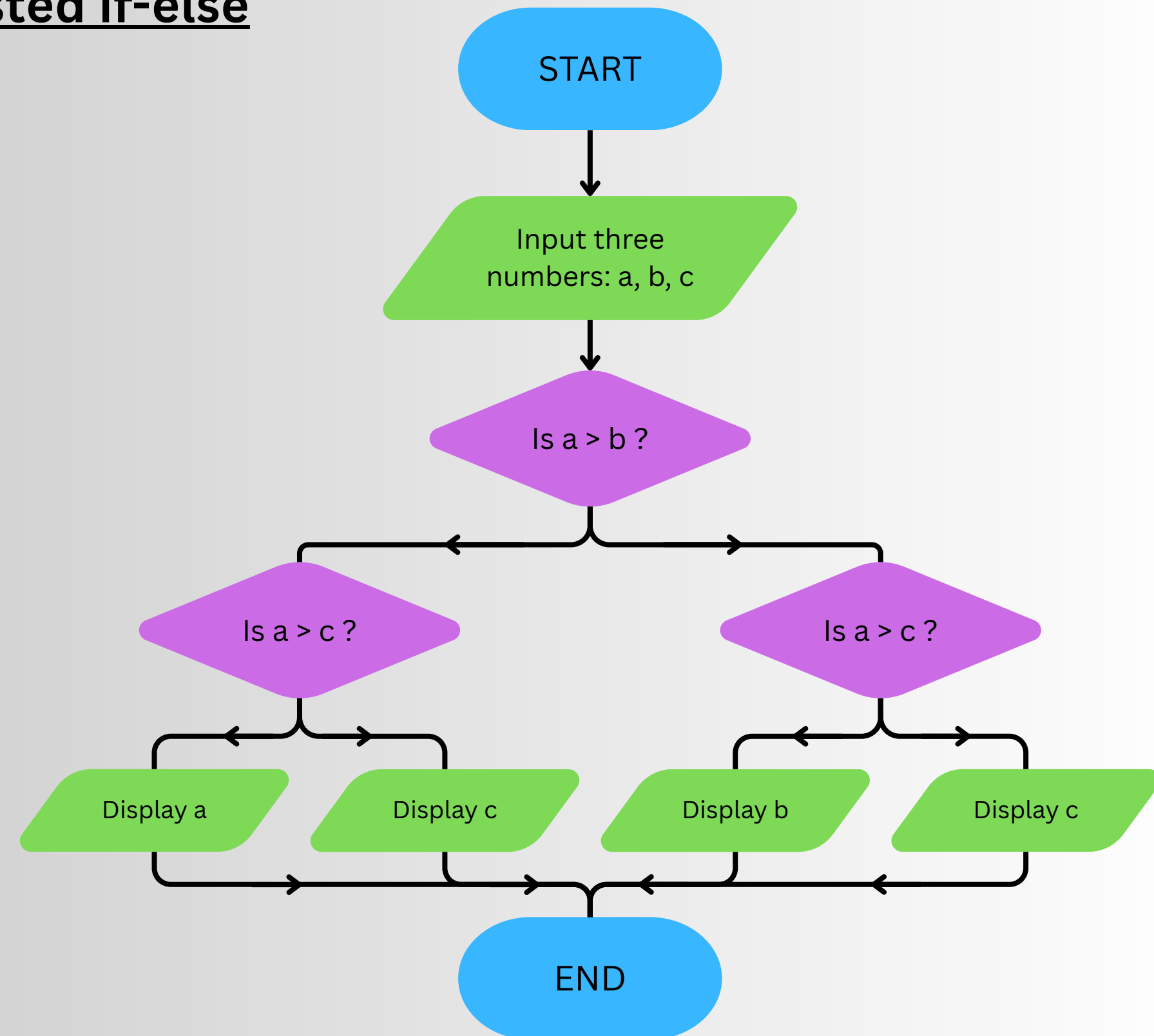
1. Start
2. Use sizeof operator to determine the size of:
int,
float,
double,
char
3. Display the sizes of all data types.
4. End



Q25. Check Greatest number among 3 using nested if-else

Algorithm:-

1. Start
2. Declare three integer variables a, b, and c.
3. "Enter three numbers:", read a, b, and c.
4. If $a > b$
 - => If $a > c$, display a is Greater.
 - => Else, display c is Greater.
5. Else
 - => If $b > c$, display b is Greater.
 - => Else, display c is Greater.
6. End

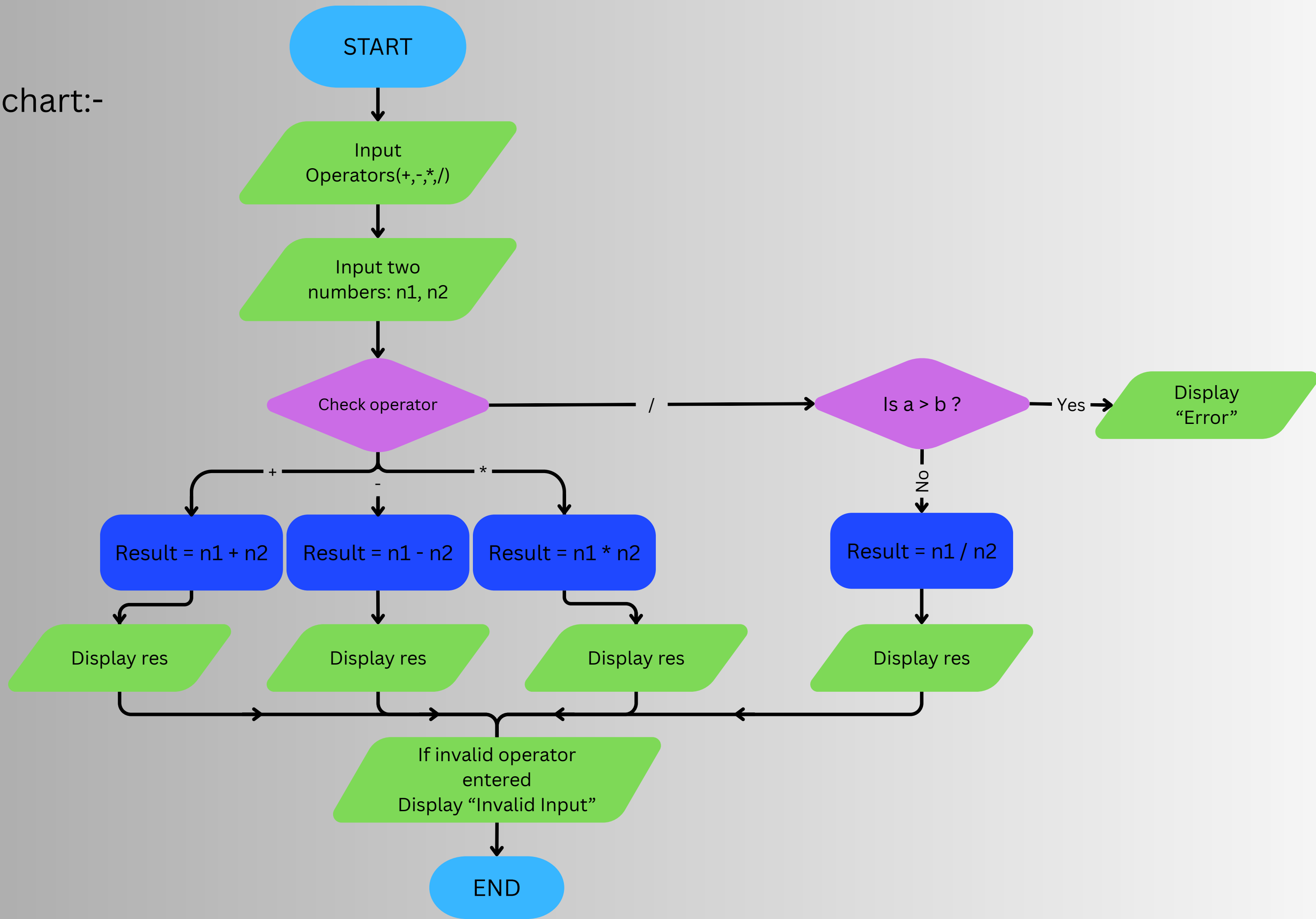


Q26. Simple Calculator using if-else

Algorithm:-

1. Start
2. Declare variables op (character), n1, n2 (double).
3. Ask the user to enter an operator (+, -, *, /).
4. Read op.
5. Ask the user to enter two numbers.
6. Read n1 and n2.
7. Use switch(op) to perform the operation:
 - => If +, display $n1 + n2$.
 - => If -, display $n1 - n2$.
 - => If *, display $n1 * n2$.
 - => If /, check if $n2 == 0 \rightarrow$ display "Error!", else display $n1 / n2$.
 - => Otherwise, display "Invalid Input".
8. End

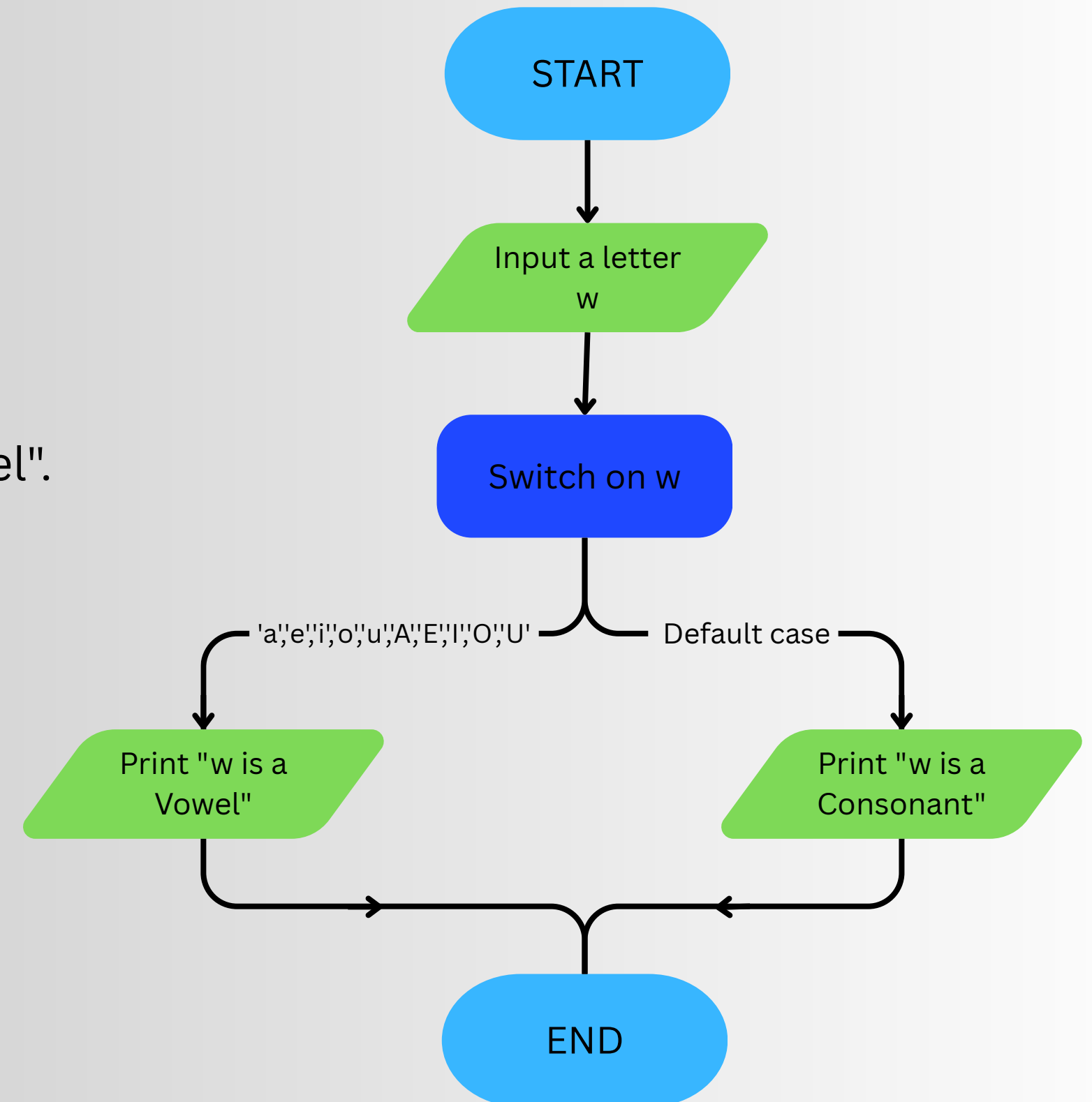
Flowchart:-



Q27. Check whether a character is a vowel or consonant using switch case

Algorithm:-

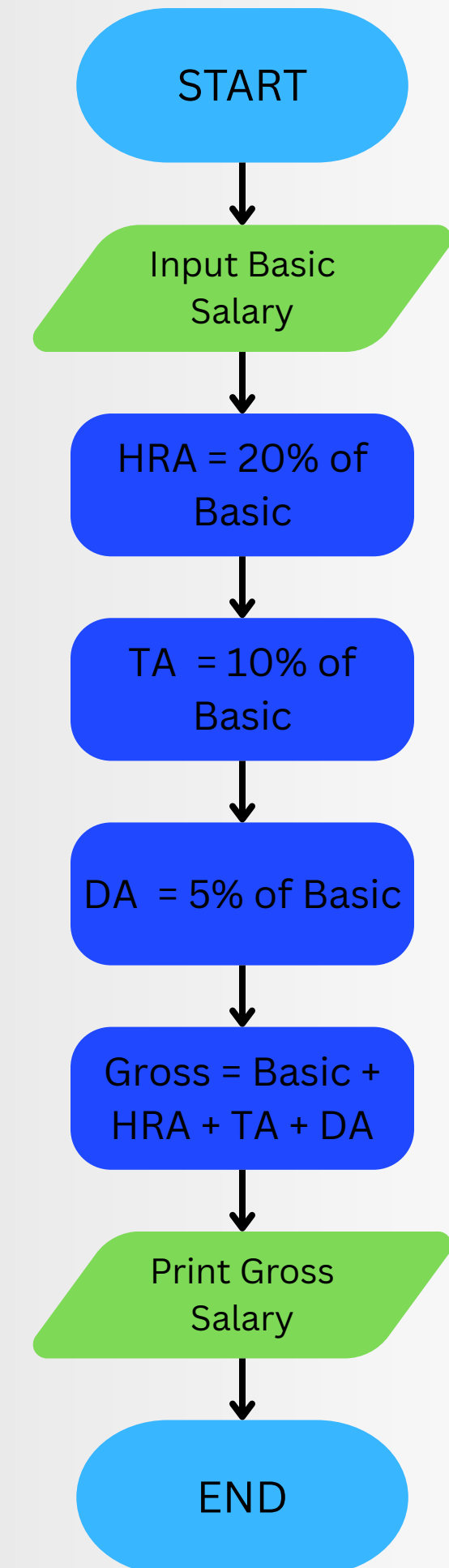
1. Start
2. Declare a character variable w.
3. Prompt: "Enter a Letter:", read w.
4. Use switch(w):
5. Case 'a', 'e', 'i', 'o', 'u', 'A', 'E', 'I', 'O', 'U' → display "w is a Vowel".
6. Default → display "w is a Consonant".
7. End



Q28. Calculate Gross Salary

Algorithm:-

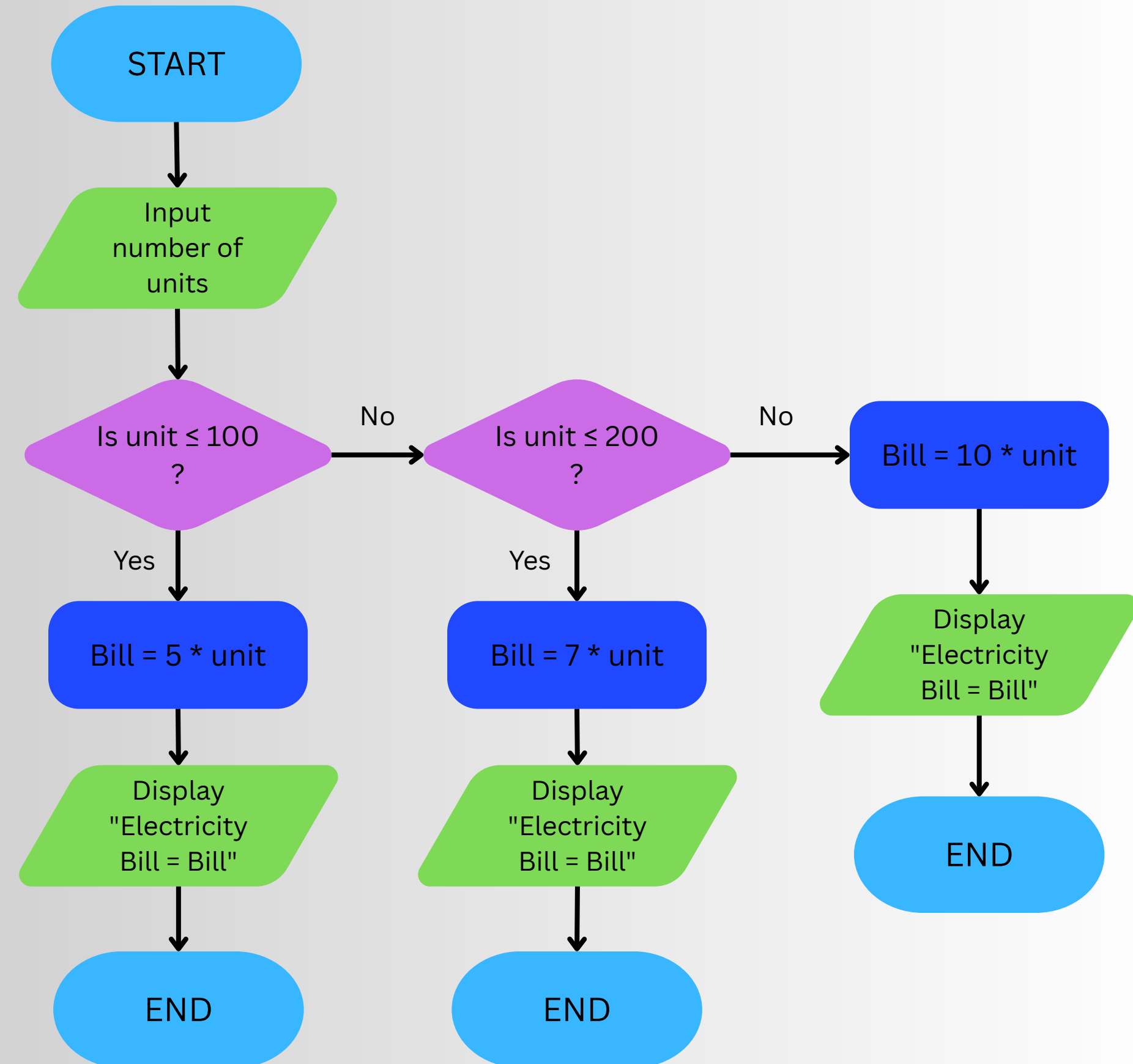
1. Start
2. Declare basic, hra, ta, da, and gross as float.
3. Prompt: "Enter Basic Salary:", read basic.
4. Calculate:
 - => $\text{hra} = 20\% \text{ of basic}$
 - => $\text{ta} = 10\% \text{ of basic}$
 - => $\text{da} = 5\% \text{ of basic}$
 - => Calculate $\text{gross} = \text{basic} + \text{hra} + \text{ta} + \text{da}$.
5. Display "Gross Salary = " followed by gross.
6. End



Q29. Calculate Electricity Bill

Algorithm:-

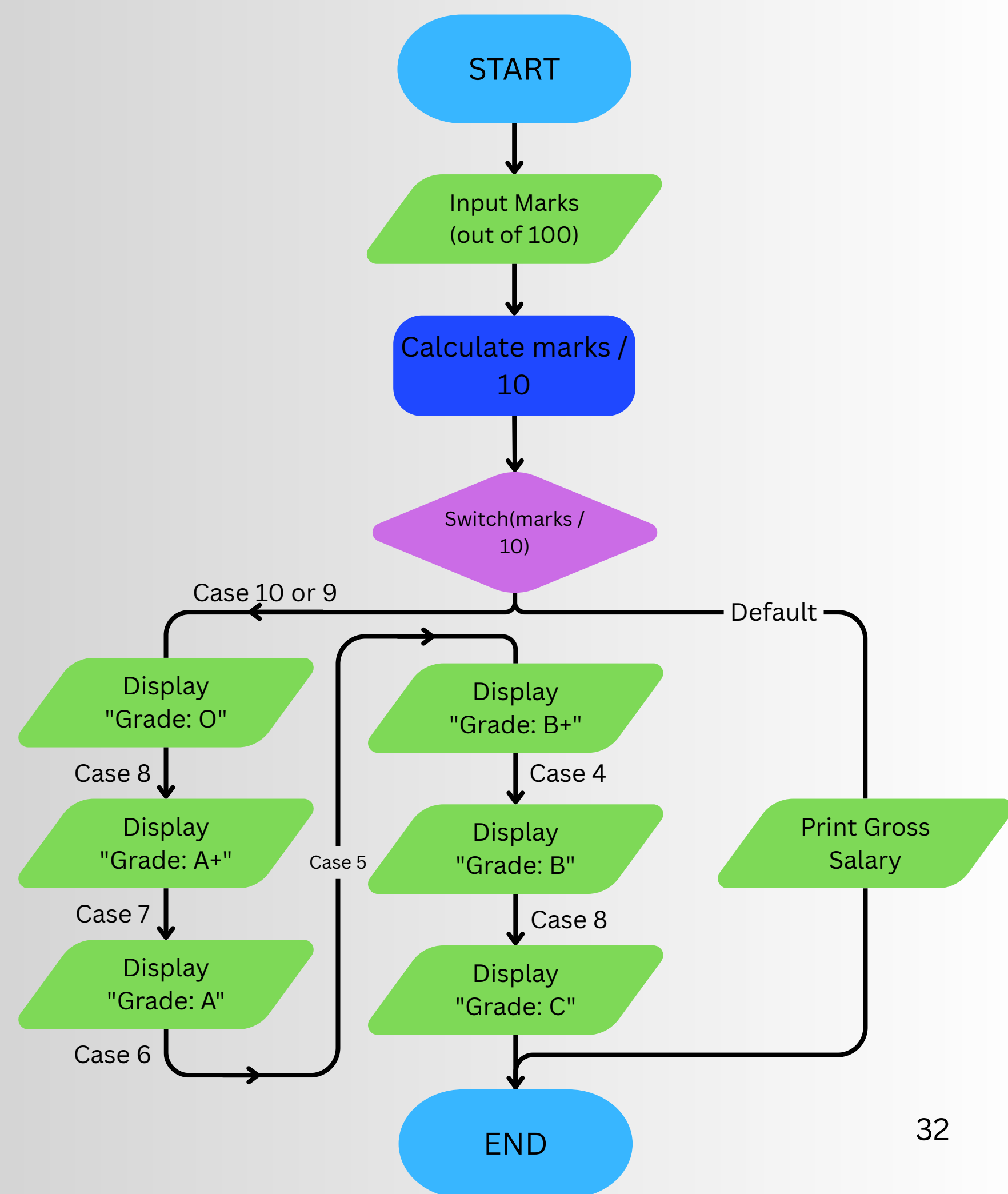
1. Start
2. Declare unit (int) and bill (float).
3. Prompt: "Enter Units:", read unit.
4. If $\text{unit} \leq 100$, $\text{bill} = 5 * \text{unit}$.
5. Else if $\text{unit} \geq 101 \ \&\& \ \text{unit} \leq 200$, $\text{bill} = 7 * \text{unit}$.
6. Else, $\text{bill} = 10 * \text{unit}$.
7. Display "Electricity Bill = " followed by bill.
8. End



Q30. Grade Calculation using switch case

Algorithm:-

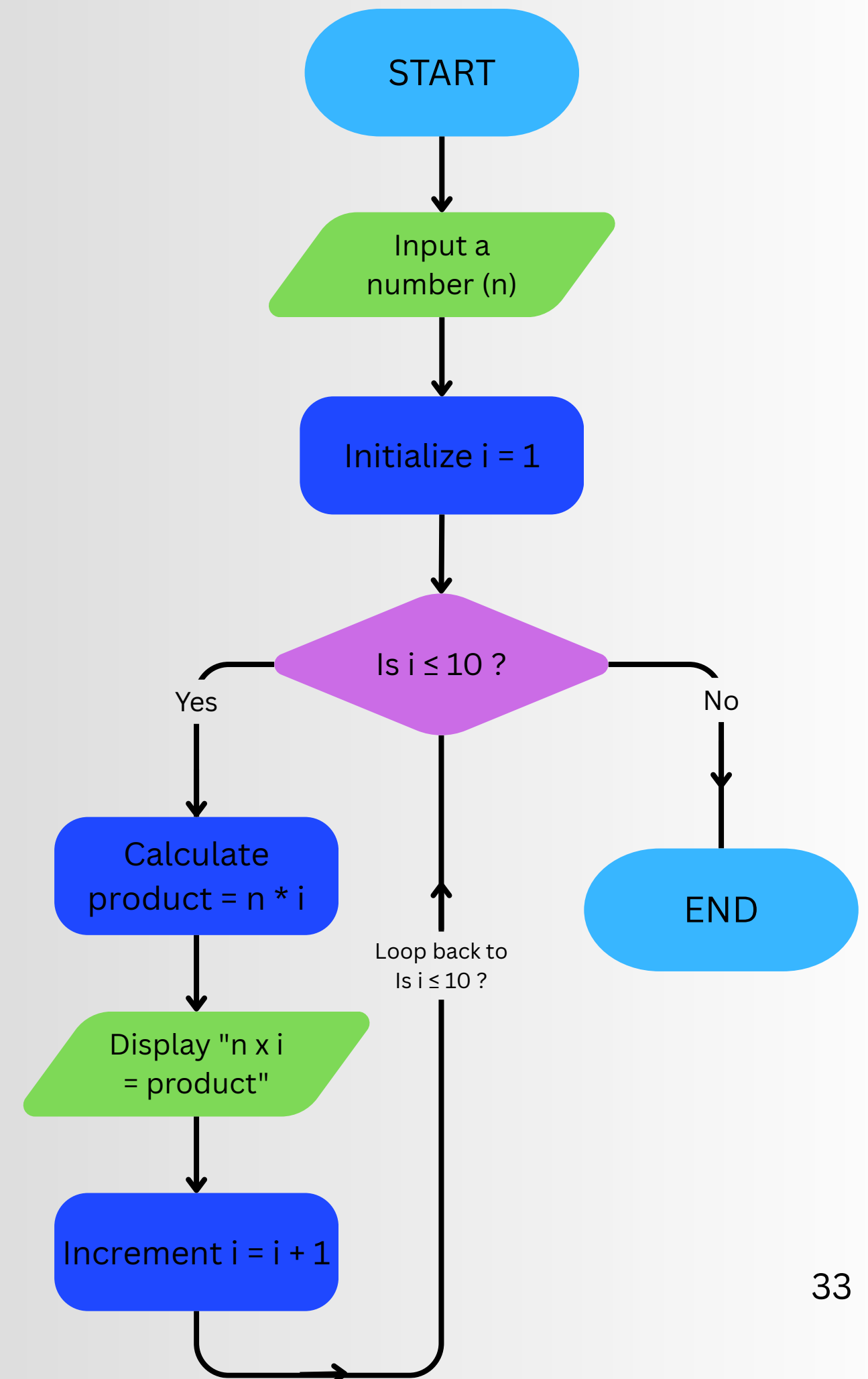
1. Start
2. Declare marks (int).
3. Prompt: "Enter Marks(out of 100):", read marks.
4. Compute marks / 10 and use switch to decide grade:
 - => 10 or 9 → Grade O
 - => 8 → Grade A+
 - => 7 → Grade A
 - => 6 → Grade B+
 - => 5 → Grade B
 - => 4 → Grade C
 - => Default → Grade Fail
5. Display the grade.
6. End



Q31. Multiplication Table of a number

Algorithm:-

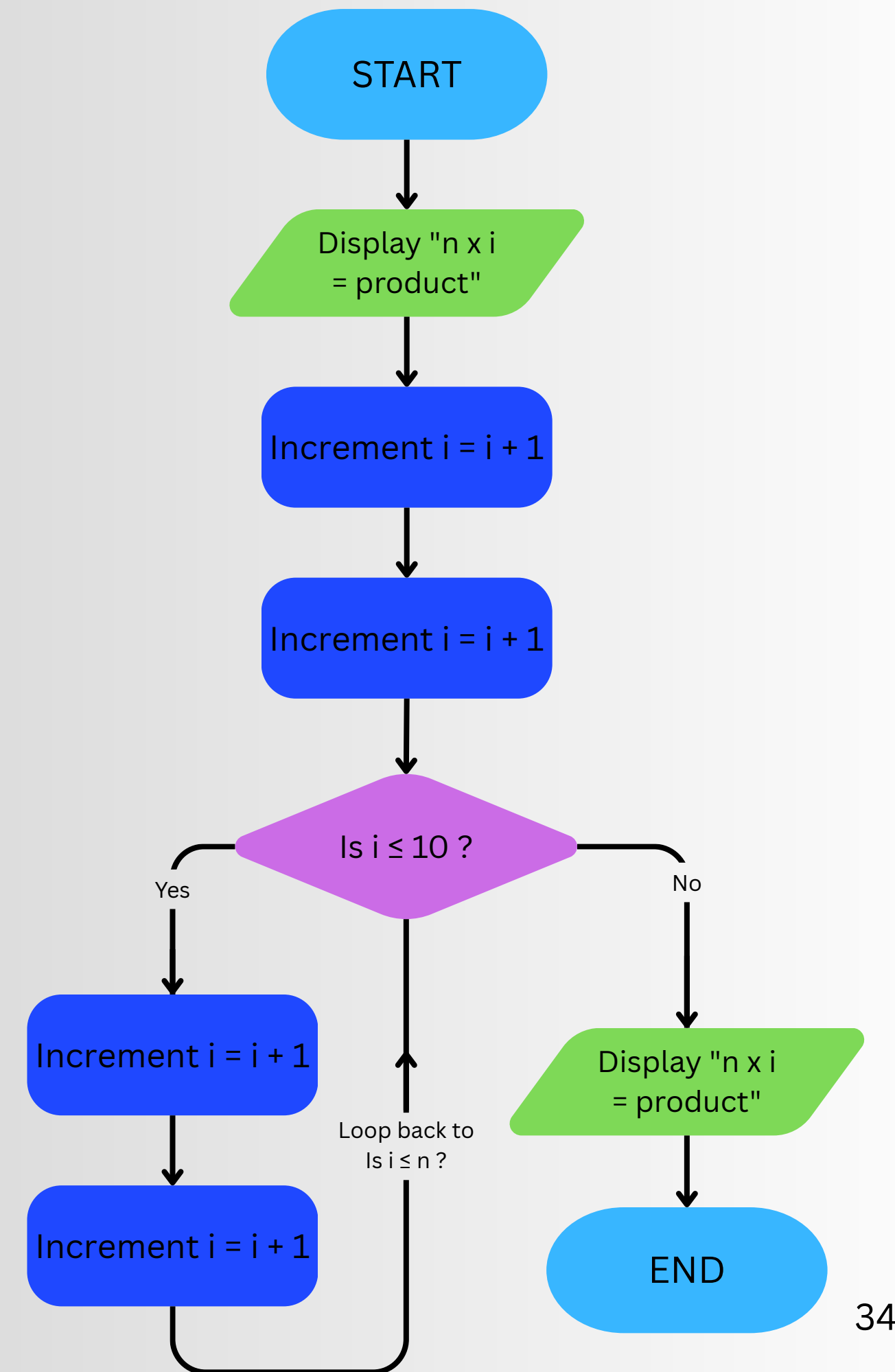
1. Start
2. Declare variable n.
3. Prompt: "Enter Any Number:", then read n.
4. Repeat for i = 1 to 10:
5. Calculate $n \times i$.
6. Display the result in the format $n \times i = n*i$.
7. End



Q32. Sum of First n natural number

Algorithm:-

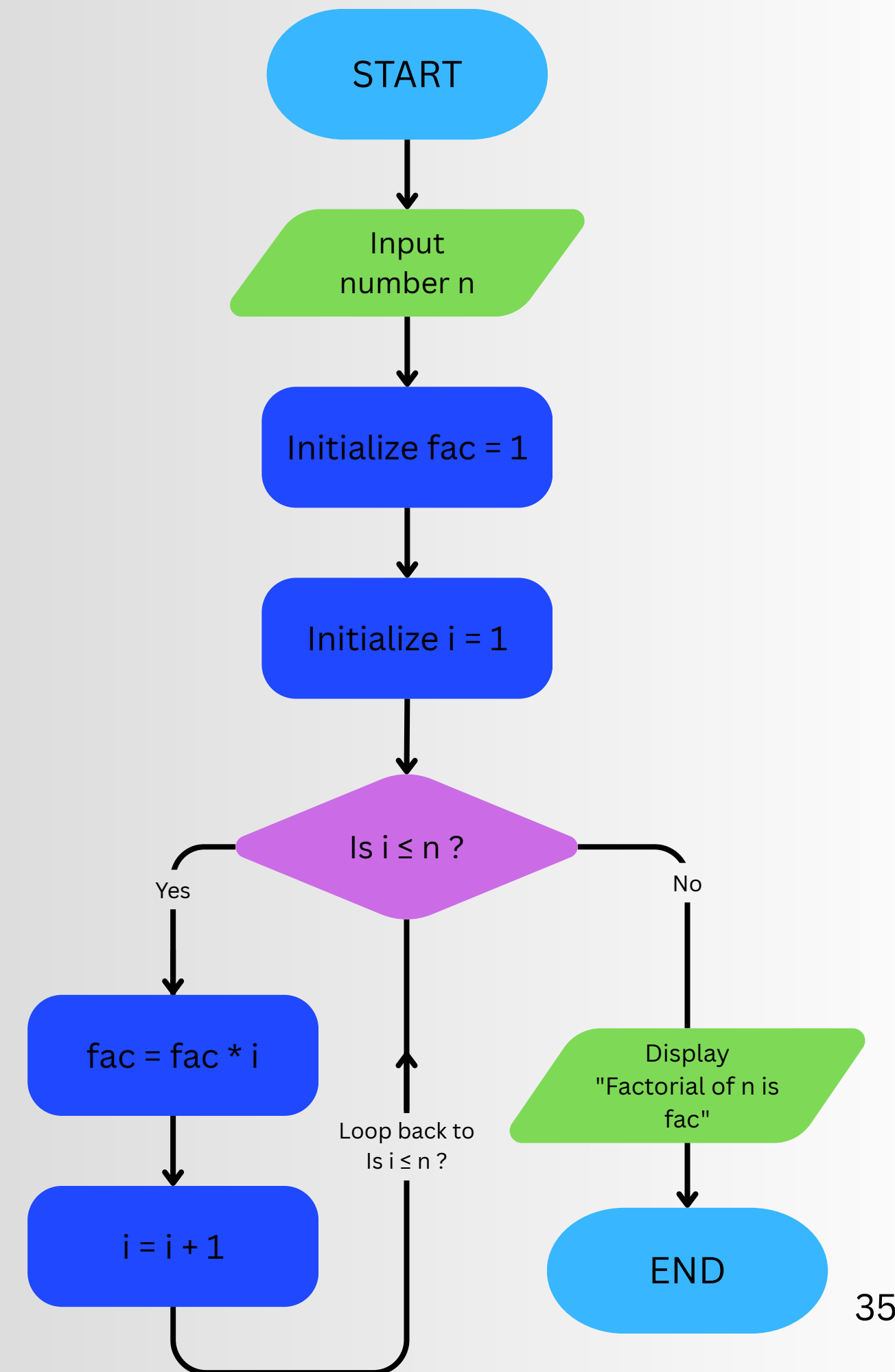
1. Start
2. Read n
3. Set sum = 0
4. Repeat from $i = 0$ to n : $\text{sum} = \text{sum} + i$
5. Print sum
6. End



Q33. Factorial of a number using For loops

Algorithm:-

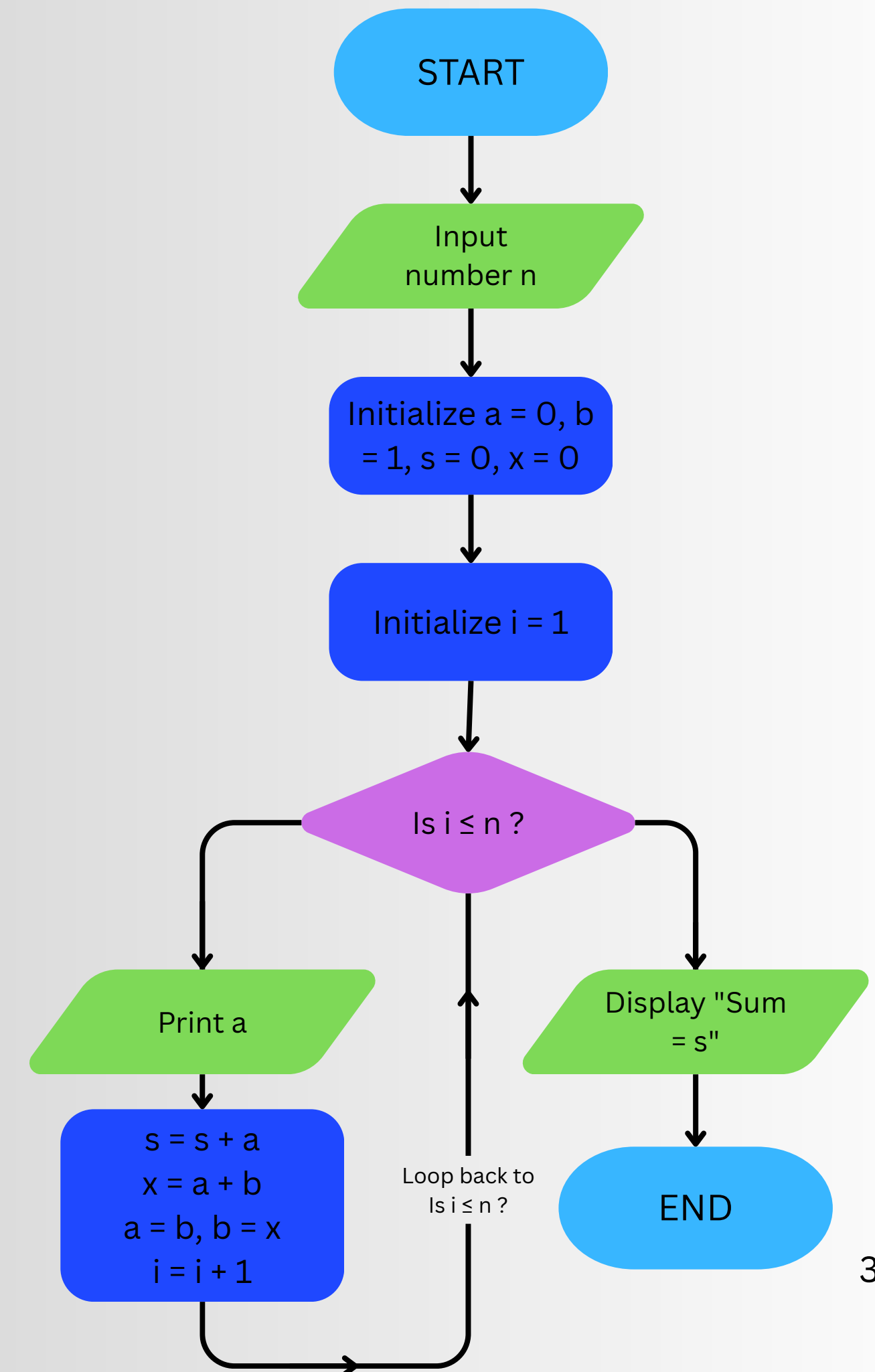
1. Start
2. Input number n
3. Set fac = 1
4. Repeat from i = 1 to n: $\text{fac} = \text{fac} * i$
5. Display fac
6. End



Q34. Display Fibonacci Series and Its Sum

Algorithm:-

1. Start
2. Declare integer variables n , $a = 0$, $b = 1$, $s = 0$, $x = 0$.
3. Prompt the user: "Enter Any Number:" and read n .
4. Initialize counter $i = 1$.
5. While $i \leq n$, do the following:
 - => Print a .
 - => Add a to sum: $s = s + a$.
 - => Compute next term: $x = a + b$.
 - => Update $a = b$, $b = x$.
 - => Increment i .
6. Display "Sum = " followed by s .
7. End



Q35. Display Prime numbers in a range

Algorithm:-

1. Start
2. Declare integers st (start) and en (end).
3. Prompt: "Enter the Starting Limit:" and read st.
4. Prompt: "Enter the Ending Limit:" and read en.
5. For i = st to en:
6. Initialize c = 0
7. If $i < 2$, skip to next iteration (continue)
8. For j = 1 to i:
9. If $i \% j == 0$, increment c by 1
10. If $c == 2$, print i (prime number)
11. End

