Welcome Students!!

My paper is Programming Fundamentals Using C

This is for I semester F.Y.B.Sc. Computer Science.

Today we are dealing with the module no. 10 which is Reversing of digits of integer, GCD of two numbers which comes under the unit IV: Algorithms for Problem Solving

Today we are going to discuss on Algorithms for Problem Solving: Reversing of digits of integer, GCD of two numbers

At the end of the module you should able to

- Explain the algorithm to reverse the digits of integer
- Describe the flowchart to reverse the digits of integer
- Explain the algorithm to find GCD of two numbers
- Describe the flowchart to find GCD of two numbers

Let us start…

**Reversing of digits of integer**

Input : num = 45

Output : num = 54

Input : num = 485

Output : num = 584

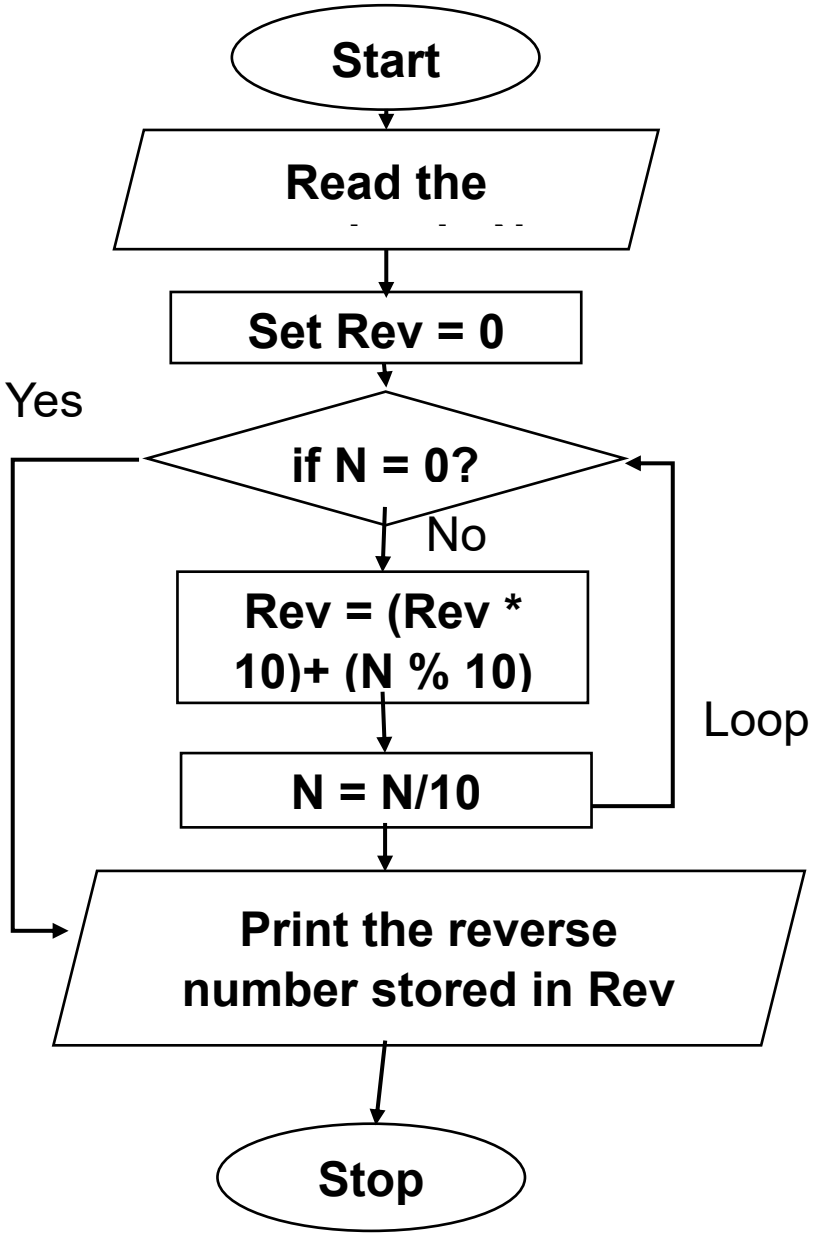
**Algorithms to Reverse the digits of integer**

step 1: Start
step 2: Initialize reverse=0.
step 3: Read digit
step 4: Check whether digit>0 then go to step 5
else go to step 9

step 5: reverse =reverse *10
step 6: reverse=reverse+digit%10
step 7: digit =digit/10
step 8: Go to step 4

step 9: Print reverse
step 10: Stop

**Flowchart to Reverse the digits of integer**




**Example:**
num = 4562
rev_num = 0

rev_num = rev_num *10 + num%10 = 2
num = num/10 = 456

rev_num = rev_num *10 + num%10 = 20 + 6 = 26
num = num/10 = 45

rev_num = rev_num *10 + num%10 = 260 + 5 = 265
num = num/10 = 4

rev_num = rev_num *10 + num%10 = 265 + 4 = 2654
num = num/10 = 0

**To find GCD of two numbers**

36 = 2 x 2 x 3 x 3

60 = 2 x 2 x 3 x 5

GCD = 2 x 2 x 3

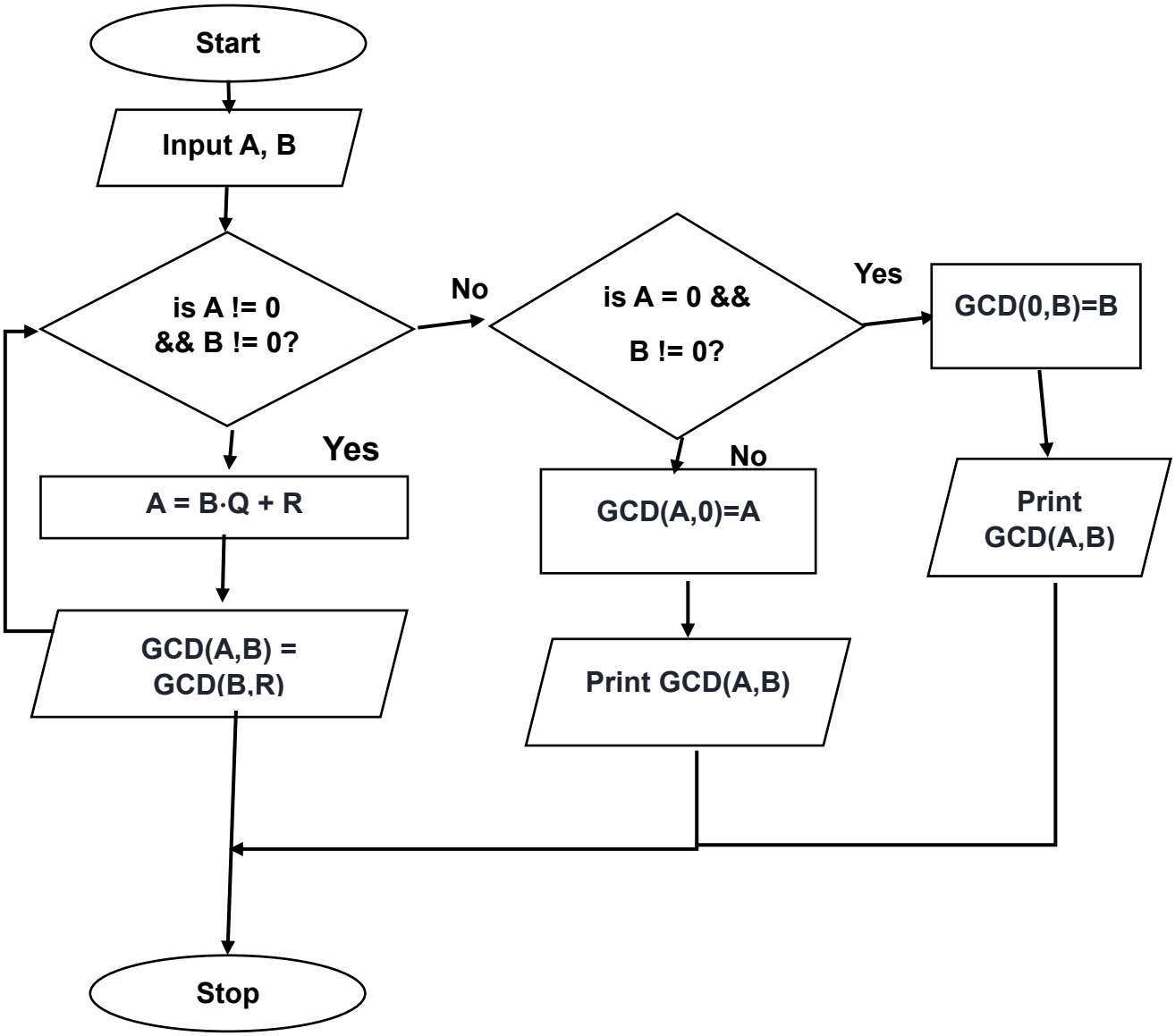
= 12

**Algorithms to find GCD of two numbers**

The Euclidean Algorithm for finding GCD(A,B) is as follows:

- If A = 0 then GCD(A,B)=B, since the GCD(0,B)=B, and we can stop.
- If B = 0 then GCD(A,B)=A, since the GCD(A,0)=A, and we can stop.
- Write A in quotient remainder form (A = B·Q + R)
- Find GCD(B,R) using the Euclidean Algorithm since GCD(A,B) = GCD(B,R)

**Flowchart to find GCD of two numbers**




**Find the GCD of 270 and 192**

- A=270, B=192
- A ≠0
- B ≠0
- Use long division to find that 270/192 = 1 with a remainder of 78. We can write this as: 270 = 192 * 1 +78
- Find GCD(192,78), since GCD(270,192)=GCD(192,78)

  A=192, B=78
- A ≠0
- B ≠0

- Use long division to find that 192/78 = 2 with a remainder of 36. We can write this as:
- 192 = 78 * 2 + 36
- Find GCD(78,36), since GCD(192,78)=GCD(78,36)

  A=78, B=36
- A ≠0
- B ≠0
- Use long division to find that 78/36 = 2 with a remainder of 6. We can write this as:
- 78 = 36 * 2 + 6
- Find GCD(36,6), since GCD(78,36)=GCD(36,6)

  A=36, B=6
- A ≠0
- B ≠0
- Use long division to find that 36/6 = 6 with a remainder of 0. We can write this as:
- 36 = 6 * 6 + 0
- Find GCD(6,0), since GCD(36,6)=GCD(6,0)

**A=6, B=0**

- **A ≠0**
- **B =0, GCD(6,0)=6**

So we have shown:

GCD(270,192) = GCD(192,78) = GCD(78,36) = GCD(36,6) = GCD(6,0) = 6

GCD(270,192) = 6

**References**

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3) R. G. Dromey, “How to solve it by computer”, PHI

4) E Horowith, S Sahni, S Rajasekaran, “Fundamentals of computer algorithm”, Galgotia.

5) Byron Gottfried, “Programming with C”, Tata McGraw Hill

**THANK YOU**