THEORY – 2

PROGRAM -1

AIM- Fibonacci

THEORY-

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| **Fibonacci Series** in C: In case of fibonacci series, next number is the sum of previous two numbers for example 0, 1, 1, 2, 3, 5, 8, 13, 21 etc. The first two numbers of fibonacci series are 0 and 1.  There are two ways to write the fibonacci series program:   * Fibonacci Series without recursion * Fibonacci Series using recursion |

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| Fibonacci Series in C without recursion  Let's see the fibonacci series program in c without recursion.   1. #include<stdio.h> 2. **int** main() 3. { 4. **int** n1=0,n2=1,n3,i,number; 5. printf("Enter the number of elements:"); 6. scanf("%d",&number); 7. printf("\n%d %d",n1,n2);//printing 0 and 1 8. **for**(i=2;i<number;++i)//loop starts from 2 because 0 and 1 are already printed 9. { 10. n3=n1+n2; 11. printf(" %d",n3); 12. n1=n2; 13. n2=n3; 14. } 15. **return** 0; 16. } |

OUTPUT-

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| Enter the number of elements:15  0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 |

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| Fibonacci Series using recursion in C  Let's see the fibonacci series program in c using recursion.   1. #include<stdio.h> 2. **void** printFibonacci(**int** n){ 3. **static** **int** n1=0,n2=1,n3; 4. **if**(n>0){ 5. n3 = n1 + n2; 6. n1 = n2; 7. n2 = n3; 8. printf("%d ",n3); 9. printFibonacci(n-1); 10. } 11. } 12. **int** main(){ 13. **int** n; 14. printf("Enter the number of elements: "); 15. scanf("%d",&n); 16. printf("Fibonacci Series: "); 17. printf("%d %d ",0,1); 18. printFibonacci(n-2);//n-2 because 2 numbers are already printed 19. **return** 0; 20. } |

OUTPUT-

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| Enter the number of elements:15  0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 |

PROGRAM -2

AIM- FACTORAIL

THEORY-

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| **Factorial Program** in C: Factorial of n is the product of all positive descending integers. Factorial of n is denoted by n!.  For example:   1. 5! = 5\*4\*3\*2\*1 = 120 2. 3! = 3\*2\*1 = 6   Here, 5! is pronounced as "5 factorial", it is also called "5 bang" or "5 shriek".  The factorial is normally used in Combinations and Permutations (mathematics).  There are many ways to write the factorial program in c language. Let's see the 2 ways to write the factorial program:-   * Factorial Program using loop * Factorial Program using recursion |

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| Factorial Program using loop  Let's see the factorial Program using loop.   1. #include<stdio.h> 2. **int** main() 3. { 4. **int** i,fact=1,number; 5. printf("Enter a number: "); 6. scanf("%d",&number); 7. **for**(i=1;i<=number;i++){ 8. fact=fact\*i; 9. } 10. printf("Factorial of %d is: %d",number,fact); 11. } |

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| Factorial Program using recursion in C  Let's see the factorial program in c using recursion.   1. #include<stdio.h> 3. **long** factorial(**int** n) 4. { 5. **if** (n == 0) 6. **return** 1; 7. **else** 8. **return**(n \* factorial(n-1)); 9. } 11. **void** main() 12. { 13. **int** number; 14. **long** fact; 15. printf("Enter a number: "); 16. scanf("%d", &number); 18. fact = factorial(number); 19. printf("Factorial of %d is %ld\n", number, fact); 20. **return** 0; 21. } |

OUTPUT-

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| **Output:**  Enter a number: 6  Factorial of 5 is: 720 |