**CSE 115 Lab on simple loop (part 3) – Ara2**

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| **1. Write a C program to read 2 integers: n and r from user and compute the value of** | |
| **Inefficient Code** | **Efficient Code** |
| #include <stdio.h>  void main()  {  int n,r,m=1,d=1,i;  printf("Enter n and r: ");  scanf("%d %d", &n, &r);  //compute n!  for(i=1;i<=n;i++)  m\*=i;  //compute (n-r)!  for(i=1;i<=n-r;i++)  d\*=i;  printf("nPr = %d", m/d);  } | #include <stdio.h>  void main()  {  int n,r,p=1,i;  printf("Enter n and r: ");  scanf("%d %d", &n, &r);  //compute nPr = (n-r+1)(n-r+2)… (n-1)n  for(i=n-r+1;i<=n;i++)  p\*=i;  printf("nPr = %d", p);  } |

**Try Yourself 1: Write a C program to read 2 integers: n and r from user and compute the value of**

**2. Write a C program to find Least Common Multiple (LCM) of two given numbers.**

#include <stdio.h>

void main()

{

int i, n1, n2, max, lcm=1;

printf("Enter any two numbers to find LCM: ");

scanf("%d %d", &n1, &n2);

i = max = (n1>n2) ? n1 : n2; //compute the max of n1 and n2; this is the lowest possible value of LCM

while(1) //while condition is always true (1)

{

if(i%n1==0 && i%n2==0) // If i is a multiple of both n1 and n2 then i is the LCM of n1 and n2

{

lcm = i;

break; //break out of the loop since LCM has been found

}

//we come to the next line if current value of i is not the LCM

i += max; //values of i are: max, 2\*max, 3\*max, …, all of which are possible values of LCM

}

printf("\nLCM of %d and %d = %d\n", n1, n2, lcm);

}

**Try Yourself 2: Write a C program to read 3 integers and compute their LCM.**

**3. Write a C program display a given number in words starting from its rightmost digit**

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| #include <stdio.h>  void main()  {  int num, i;  printf("Enter any number to print in words: ");  scanf("%d", &num);  // Finds last digit of the number and print it in words  while(num!=0)  {  switch(num%10) {  case 0: printf("Zero "); break;  case 1: printf("One "); break; | case 2: printf("Two "); break;  case 3: printf("Three "); break;  case 4: printf("Four "); break;  case 5: printf("Five "); break;  case 6: printf("Six "); break;  case 7: printf("Seven "); break;  case 8: printf("Eight "); break;  case 9: printf("Nine ");  }//end of switch  num = num/10;  }//end of while loop  } |

**Exercise Problems:**

1. **Write a C program to find Greatest Common Divisor (GCD ) of two given integers. GCD of two integers is the highest number that totally divides those two integers. E.g. GCD of 15 and 25 is 5.**
2. **Write a C program to compute the quadruple factorial of a given number**
3. **Write a C program to compute the super-factorial of a given number**

**Assignment Problems:**

1. **Write a C program to display a given number in words starting from its leftmost digit.**

**Hint: Compute the reverse of the given number and then use a while loop like practice 3 to print the digits. E.g., if input number is 1234 your program should print “One Two Three Four”.**

1. **Write a C program to convert a given Binary number to its Decimal equivalent.**
2. **Write a C program to convert a given decimal number to its binary equivalent.**
3. **Write a C program to compute the sum of the series: 1/1! + 1/2! + 1/3! + … + 1/n! where n is an input.**
4. **Write a C program that prints all even numbers between m and n (m,n are user inputs) except the ones which are divisible by 3. [*Hint*: Use continue statement within a loop] Sample input/output:**

Enter m: **99**

Enter n: **116**

All even numbers between 100 and 112 except those divisible by 3 are: 100, 104, 106, 110, 112, 116,

1. **Write a C program that asks a shopper to enter amount (in kg) and total price of sugar he bought from different places. If the shopper mistakenly enters a negative number as amount/price, it prints an error message “Invalid input, enter a positive number” and prompts the shopper to give another input. When the shopper enters 0 as an amount then the program terminates and shows the shopper total amount, price and average price of sugar per kg. [*Hint*: Use continue statement within a loop] Sample input/output:**

Enter amount (in kg): **5**

Enter price: **350**

Enter amount (in kg): **-3**

*Invalid input, enter a positive number*

Enter amount (in kg): **5**

Enter price: **-67**

*Invalid input, enter a positive number*

Enter amount (in kg): **10**

Enter price: **650**

Enter amount (in kg): **0**

Total amount (in kg): 15, Total price: 1000, Average price per kg: 66.67