***C Programming Lab***

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## Part A

### Program to read radius of a circle and to find area and circumference.

| /\*Area ( PI\*r\*r ) and Circumference ( 2\*PI\*r ) of a circle\*/ #include <stdio.h> int main() {  int r;  float area, circ;  printf("Enter the radius: ");  scanf("%d", &r);  area = 3.14 \* r \* r;  circ = 2 \* 3.14 \* r;  printf("Area = %f\n", area);  printf("Circumference = %f\n", circ);  return 0; } |
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**Output -**

| Enter the radius: 3 Area = 28.260000 Circumference = 18.840000 |
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### Program to read three numbers and find the biggest of three.

| #include<stdio.h>  int main() {  int a,b;  printf("Enter two numbers: ");  scanf("%d %d", &a, &b);  if( a > b)  printf("%d is the largest.\n", a);  else  printf("%d is the largest.\n", b);  return 0; } |
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**Output -**

| Enter two numbers: 2 3 3 is the largest. |
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### Program to demonstrate library functions in math.h

| #include<stdio.h> #include<math.h> int main() {  //ceil()  printf("Ceil = %f\n", ceil(4.6));  // floor()  printf("Floor = %f\n", floor(4.6));  //fabs()  printf("Fabs = %f\n", fabs(-2));  //sqrt()  printf("sqrt = %f\n", sqrt(16));  //pow()  printf("Power = %f\n", pow(2,3));  //log()  printf("Log = %f\n", log(4.0));  // log10()  printf("Log10 = %f\n", log10(100.0));  // exp()  printf("Exp = %f\n", exp(4.0));  // cos()  printf("Cosine = %f\n", cos(0.523599));  return 0; } |
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**Output -**

| Ceil = 5.000000 Floor = 4.000000 Fabs = 2.000000 sqrt = 4.000000 Power = 8.000000 Log = 1.386294 Log10 = 2.000000 Exp = 54.598150 Cosine = 0.866025 |
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### Program to generate n primes

| **#include<stdio.h> int main() {  int n,i,j, count;  printf("Enter the number: ");  scanf("%d", &n);  printf("Prime numbers between 2 and %d are: ",n);  for(i=2;i<=n;i++)  {  count = 0;  for(j=2;j<i;j++)  {  if( i % j == 0)  count++;  }  if(count == 0)  printf("%d ",i);  }  printf("\n");  return 0; }** |
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**Output -**



| Enter the number: 20 Prime numbers between 2 and 20 are: 2 3 5 7 11 13 17 19 |
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### Program to read a number, find the sum of the digits, reverse the number and check it for palindrome.

| #include <stdio.h>  int main() {  int n, num, rev = 0, rem, sum = 0;    printf("Enter a number: ");  scanf("%d", &n);   num = n;  while (num > 0)  {  rem = num % 10;  sum += rem;  rev = (rev \* 10) + rem;  num /= 10;  }  printf("Sum of the digits in %d = %d\n", n, sum);  printf("Reversed number = %d\n", rev);   if( rev == n)  printf("It is a palindrome number.\n");  else  printf("It is not a palindrome number.\n");   return 0; } |
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**Output -**

| Enter a number: 123 Sum of the digits in 123 = 6 Reversed number = 321 It is not a palindrome number. |
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### Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers.

| #include<stdio.h> int main() {  int i =0, a[100], sum =0;  while(1)  {  printf("%d - Enter the number (999 to stop): ", (i+1));  scanf("%d", &a[i]);  if(a[i] == 999)  break;  if(a[i] > 0)  sum += a[i];  i++;  }  printf("Sum of positive numbers = %d\n", sum);  return 0; } |
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**Output -**

| 1 - Enter the number (999 to stop): 3 2 - Enter the number (999 to stop): 4 3 - Enter the number (999 to stop): 1 4 - Enter the number (999 to stop): 999 Sum of positive numbers = 8 |
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### Program to read percentage of marks and to display an appropriate message. (Demonstration of else-if ladder)

| #include <stdio.h> int main() {  float avg;   printf("Enter the average of all the marks: ");  scanf("%f", &avg);    if (avg >= 80)  printf("Distinction\n");  else if (avg < 80 && avg >= 60)  printf("First class\n");  else if (avg < 60 && avg >= 50)  printf("Second class\n");  else if (avg < 50 && avg >= 40)  printf("Pass\n");  else  printf("Fail\n");   return 0;  } |
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**Output -**



| Enter the average of all the marks: 69 First class |
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### Program to perform addition and subtraction of Matrices.

| #include<stdio.h> int main() {  int a[10][10], b[10][10], sum[10][10], diff[10][10],i, j, r, cl;   printf("Enter number of rows and columns: ");  scanf("%d %d", &r, &cl);    printf("Enter %d elements into matrix A: ", (r \* cl));  for(i = 0; i < r; i++)  for(j = 0; j < cl; j++)  scanf("%d", &a[i][j]);  printf("Enter %d elements into matrix B: ", (r \* cl));  for(i = 0; i < r; i++)  for(j = 0; j < cl; j++)  scanf("%d", &b[i][j]);   for(i = 0; i < r; i++)  for(j = 0; j < cl; j++)  {  sum[i][j] = a[i][j] + b[i][j];  diff[i][j] = a[i][j] - b[i][j];  }    printf("Sum of two matrices\n");  for(i = 0; i < r; i++)  {  for(j = 0; j < cl; j++)  printf("%d ", sum[i][j]);  printf("\n");  }  printf("Difference of two matrices\n");  for(i = 0; i < r; i++)  {  for(j = 0; j < cl; j++)  printf("%d ", diff[i][j]);  printf("\n");  }   return 0; } |
| --- |

**Output -**

| Enter number of rows and columns: 2 2 Enter 4 elements into matrix A: 1 2 3 4 Enter 4 elements into matrix B: 1 2 3 4 Sum of two matrices 2 4 6 8 Difference of two matrices 0 0 0 0 |
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## Part B

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### Program to find the length of a string without using built in function.

| #include<stdio.h> #include<string.h>  int main() {  char s[25];  int i = 0;  printf("Enter a word: ");  //scanf("%s", s);  gets(s);  printf("s = %s\n", s);  while (s[i] != '\0')  i++;  printf("Length = %d\n", i);  printf("Length using function = %ld\n", strlen(s));  return 0; } |
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**Output -**

| Enter a word: noice  s = noice Length = 5 Length using function = 5 |
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### Program to demonstrate pointers in C.

| #include<stdio.h> int main() {  int n =10;  int \*ptr;   printf("Value of n = %d\n", n);  printf("Address of n = %x\n", &n);   ptr = &n;  printf("Address of ptr = %x\n", &ptr);  printf("Value of ptr = %x\n", ptr);  printf("Value of n using ptr = %d\n", \*ptr);   \*ptr = 20;  printf("New value of n = %d\n", n);  printf("New value of n using ptr = %d\n", \*ptr);   return 0; } |
| --- |

**Output -**

| Value of n = 10 Address of n = 1158751c Address of ptr = 11587520 Value of ptr = 1158751c Value of n using ptr = 10 New value of n = 20 New value of n using ptr = 20 |
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### Program to check a number for prime by defining isprime( ) function.

| #include<stdio.h>  void isprime(int n) {  int c = 0, i;   for(i = 2; i < n; i++)  if( n % i == 0)  c++;    if(c == 0)  printf("%d is a prime number.\n", n);  else  printf("%d is not a prime number.\n", n); }  int main() {  int a;   printf("Enter the number: ");  scanf("%d", &a);   isprime(a);  return 0;  } |
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**Output -**

| Enter the number: 3  3 is a prime number. |
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### Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.

| #include <stdio.h> int main() {  char ch[150];  int i, alpha, digit, vowel, consonant, space, splchar;  alpha = digit = vowel = consonant = space = splchar = 0;   printf("Enter a string: ");  fgets(ch, sizeof(ch), stdin);   for (i = 0; ch[i] != '\0'; ++i)  {   if(ch[i] >= 'a' && ch[i] <= 'z' || ch[i] >= 'A' && ch[i] <= 'Z' )  {  alpha++;  if(ch[i] == 'a' || ch[i] == 'e' || ch[i] == 'i' || ch[i] == 'o' || ch[i] == 'u')  vowel++;  else  consonant++;  }  else if (ch[i] >= '0' && ch[i] <= '9')  digit++;  else if (ch[i] == ' ')  space++;  else  splchar++;  }    printf("Alphabets: %d\n", alpha);  printf("Vowels: %d\n", vowel);  printf("Consonants: %d\n", consonant);  printf("Digits: %d \n", digit);  printf("White spaces: %d\n", space);  printf("Special Character: %d\n", splchar);  return 0; } |
| --- |

**Output -**

| Enter a string: new h%$oriz12# Alphabets: 8 Vowels: 3 Consonants: 5 Digits: 2 White spaces: 1 Special Character: 4 |
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### Program to Swap Two Numbers using Pointers.

| #include<stdio.h> void swap(int \*a, int \*b) {  int t;  t = \*a;  \*a = \*b;  \*b = t; }  int main() {  int x, y;  printf("Enter two numbers: ");  scanf("%d %d", &x, &y);  printf("Before\tx = %d\ty = %d\n", x, y);  swap(&x, &y);  printf("After\tx = %d\ty = %d\n", x, y);   return 0; } |
| --- |

**Output -**

| Enter two numbers: 6 9 Before x = 6 y = 9 After x = 9 y = 6 |
| --- |

### Program to demonstrate student structure to read & display records of n students.

| #include<stdio.h>  struct student {  char name[30];  int roll;  float perc; };  int main() {  struct student s[20];  int i, n;   printf("Enter the number of students: ");  scanf("%d", &n);   for(i = 0; i < n; i++)  {  printf("Enter name, roll no. and percentage of student %d: ", (i+1));  scanf("%s %d %f", s[i].name, &s[i].roll, &s[i].perc);  }   printf("\n\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");  printf("\nStudents Details\n");  printf("Name\tRoll no.\tPercentage\n");  for(i = 0; i < n; i++)  printf("%s\t%d\t\t%.2f\n", s[i].name, s[i].roll, s[i].perc);   return 0; } |
| --- |

**Output -**



| Enter the number of students: 2 Enter name, roll no. and percentage of student 1: sample 69 99 Enter name, roll no. and percentage of student 2: sam2 99 69   \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Students Details Name Roll no. Percentage sample 69 99.00 sam2 99 69.00 |
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