

CMR Engineering College

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2022-26_I_CS_B_C Programming Lab

C PROGRAMMING LAB_EXERCISE_OPERATORS

Attempt : 1
Total Mark : 100
Marks Obtained : 76.5

Section 1 : CODING

1. Write a C program to find the roots of a Quadratic equation.

Answer

```
// You are using GCC
#include <stdio.h>
#include <math.h>
int main(){
    float a,b,c;
    scanf("%f %f %f",&a,&b,&c);
    float real=-b/(2*a);
    float d=b*b-4*a*c;
    float imaginary=sqrt(abs(d))/(2*a);
    if(d>0){
        printf("root1 = %.2f and root2 = %.2f",real+imaginary,real-imaginary);
    }
    else if(d==0){
        printf("root1 = root2 = %.2f;",real);
    }
    else{
        printf("root1 = %.2f+%.2fi and root2 = %.2f-
%.2fi",real,imaginary,real,imaginary);
    }
}
```

```
}
```

Status : Correct

Marks : 10/10

2. Write the program for the simple, compound interest.

Answer

```
// You are using GCC
#include <stdio.h>
#include<math.h>

//long double pow(long double a,long double x);
int main(){
    float p,t,r;
    scanf("%f %f %f",&p,&t,&r);
    r/=100;
    float si=p*r*t;
    float ci=p*pow(1+r,t)-p;
    printf("Simple interest = %.2f\n",si);
    printf("Compound interest = %.2f",ci);
}
long double powd(long double a,long double x){
    long double result=1;
    for(int i=1;i<=x;i++) result *=a;
    return result;
}
```

Status : Partially correct

Marks : 7.5/10

3. Write a simple program that prints the results of all the operators available in C (including pre/ post-increment, bitwise and/or/not, etc.).

Answer

```
// You are using GCC
#include <stdio.h>
unsigned int notoperator(int num);
int main()
{
    int a,b;
```

```

scanf("%d%d",&a,&b);
printf("the arithmetic operators result is %d %d %d %d\n",a+b,a-b,a*b,a/b);
printf("the relational operators result is %d %d %d %d\n",a>b,a<b,a>=b,a<=b);
printf("the logical operators result is %d %d %d\n",a&&b,a||b,a||b);
printf("the increment operator result is %d %d %d %d\n",a++,++a,b++,++b);
printf("the decrement operator result is %d %d %d %d\n",a--,--a,b--,--b);
printf("the bitwise AND operator result is %d\n",a&b);
printf("the bitwise OR operator result is %d\n",a|b);
printf("the bitwise NOT operator result is %u",notoperator(a));
}
unsigned int notoperator(int num){
    unsigned int preresult=0;
    while(num!=0){
        preresult <=<=1;
        preresult+=!(num%2);
        num=num>>1;
    }
    unsigned int result=0;
    while(preresult!=0){
        result<=<=1;
        result+=preresult%2;
        preresult=preresult>>1;
    }
    return result;
}

```

Status : **Wrong**

Marks : 0/10

4. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut + (1/2)at^2$ where u and a are the initial velocity in m/sec ($= 0$) and acceleration in m/sec^2 ($= 9.8 m/s^2$)).

Answer

```

#include <stdio.h>
#include <math.h>
int main(){
    printf("%.2f",sqrt(30/4.9));
}

```

Status : Correct

Marks : 10/10

5. Ramu and Somu are going on a picnic. Ramu packs m apples, n oranges. Somu packs $m1$ more apples than Ramu and $n1$ more oranges than Ramu.

If Somu eats x of his apples and Ramu eats y of Somu's oranges, how many apples and oranges are left in total?

Answer

```
// You are using GCC
#include<stdio.h>
int main(){
    int m,n,m1,n1,x,y;
    scanf("%d %d %d %d %d %d",&m,&n,&m1,&n1,&x,&y);
    int remApples=m+m1+1;
    int remOranges=n+n1+1;
    printf("%d %d",remApples,remOranges);
}
```

Status : Partially correct

Marks : 1/10

6. There are 3 friends named John, Ram, Joseph who worked together. After their work, they spent their money. Given their salaries and expenditures, find the friend who has more money.

Answer

```
// You are using GCC
#include <stdio.h>
#include <math.h>
int main(){
    long double johnsal, ramsal, josephsal, johnexp, ramexp, josephexp;
    scanf("%Lf%Lf%Lf%Lf%Lf%Lf", &johnsal, &ramsal, &josephsal, &johnexp,
    &ramexp, &josephexp);

    long double john=johnsal-johnexp;
    long double ram =ramsal -ramexp;
    long double joseph=josephsal-josephexp;
```

```

long double max;
if(john>ram && john>joseph) max=john;
if(ram>john && ram>joseph) max=ram;
if(joseph>ram && joseph>john) max=joseph;

printf("%.0Lf",max);
}

```

Status : Partially correct

Marks : 8/10

7. Aakash felt very bored to do math homework. As he was interested to play with his friends, he needs your help to do the homework. Help him by writing a program to automate the work. He gave a number which is greater than 10. Your program needs to calculate perimeter of a rectangle using the given number. The last digit of the number is the breadth and the remaining digits correspond to the length.

Eg:

-> If num is 23, length =2; breadth = 3.

-> If num is 562, length =56; breadth = 2.

Answer

```

#include<stdio.h>
int main(){
    int l,b,input;
    scanf("%d",&input);
    if(input<11){
        printf("-1");
        return 0;
    }
    b=input%10;
    l=input/10;
    printf("%d",2*(l+b));
}

```

Status : Correct

Marks : 10/10

8. Francis is trying to calculate his water tax by himself.

Take negative inputs as positive values.

Write a program to compute the water tax using ternary operator

The water tax slab is as follows:

If units <100, then cost is Rs.1 per unit.If 100<=units<=500, then cost is Rs.1.5 per unitIf units > 500, then cost is Rs.3 per unit.

Answer

```
#include<math.h>
#include<stdio.h>
int main(){
    float volume;
    scanf("%f",&volume);
    volume = volume<0 ? -volume : volume;

    float cost = volume<100 ? volume : volume<501? volume*1.5 : volume*3;
    printf("%.2f",cost);
}
```

Status : Correct

Marks : 10/10

9. Sasikumar is a mathematics teacher and he is preparing a question paper of his own, So he need to calculate the answers for the questions he prepared without any errors. As he is busy with his work he has no time to make it.

Write the program and trace the output for the following expressions:

- a) $x = a + b * 5 / 4 + c \% 3 * 5$, where a, b and c are variables (inputs).
- b) $y = u > v ? u : v$; where u and v are variables (inputs).
- c) $z = ++i \&\& ++j \&\& ++k$; where i, j, and k are variables (inputs).

Answer

```
#include<stdio.h>
int main(){
    int a,b,u,v;
```

```

int c,i,j,k;
scanf("%d%d%d%d%d%d%d", &a, &b, &c, &u, &v, &i, &j, &k);

printf("x=%d\n", a+b*5/4+c%3*5);
printf("y=%d\n", u>v?u:v);
printf("z=%d", ++i&&++j&&++k);
}

```

Status : Correct

Marks : 10/10

10. Lokesh is designing a micro-controller for finding the maximum power usage in a system. In order to implement this, he has to check whether the input voltage has any values less than or equal to it such that its sum and bitwise OR with the given voltage is the same. Help him write a code to implement the same.

Answer

```

#include<stdio.h>
int main(){
    int vol;
    scanf("%d",&vol);
    int count=0;
    for(int i=0; i<=vol; i++) count += (vol+i)==(vol|i)?1:0;
    printf("%d",count);
}

```

Status : Correct

Marks : 10/10