

C, C++, DSA in depth

Doubt class assignment-9



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Asterisk

Q. 1

Sum of first N natural numbers

$$N = 5$$

Sum is 15

$$N = 10$$

Sum is 55

$$N = 100$$

Sum is 5050

$$1 + 2 + 3 + 4 + 5$$

$$S = 0 + 1$$

$$0 + 1$$

Sum of 0 nos + 1

$$S = S + 2$$

$$1 + 2$$

Sum of 1 no + 2

$$S = S + 3$$

$$3 + 3$$

Sum of 2 nos + 3

$$S = S + 4$$

$$6 + 4$$

Sum of 3 nos + 4

$$S = S + 5$$

$$10 + 5$$

Sum of 4 nos + 5

$$S = S + i$$

Ass. 9
Q. 2

Sum of first N even natural nos

$$N=5$$

Sum is 30

$$N=10$$

Sum is 110

$$N=100$$

Sum is 10^{100}

$$N=5$$

$$2+4+6+8+10$$

$$S=S+i \rightarrow$$

$i = 1 \text{ to } N$ x

$i = 2 \text{ to } 2N$

with step = 2

①

for ($i=2, S=0; i \leq 2*N; i+=2$)

$$S = S + i;$$

②

for ($i=1, S=0; i \leq N; i++$)

$$S = S + 2*i;$$

Ass-9

Q. 3

Sum of first N odd natural numbers

$$N = 5$$

Sum is 25

$$N = 8$$

Sum is 64

$$N = 12$$

Sum is 144

1 3 5 7 9

①

```
for (i=1, s=0; i<= 2*N; i+=2)  
    s = s + i;
```

②

```
for (i=1, s=0; i<=N; i++)  
    s = s + 2*i - 1;
```

Ass. 9
Q. 4

Sum of squares of first N natural numbers.

$$1^2 + 2^2 + 3^2 + \dots + N^2$$

$$S = S + i * i;$$

Ass-9
Q.5

Sum of cubes of first N natural nos.

$$S = S + i * i * i;$$

Abs - 9

Q. 6

Factorial

$$1 + 2 + 3 + 4 + \dots + N$$

$$S = S + i;$$

$$1 * 2 * 3 * 4 * \dots * N$$

$$S = S * i;$$

```
while(N)
{
    P=P*N;
    N--;
}
```

```
int i, P, N;
printf("Enter a number");
scanf("%d", &N);
for(i=1, P=1; i<=N; i++)
    P=P*i;
printf("Factorial is %d", P);
```

P = 1 * 5;
P = 5 * 4;
P = 20 * 3;
P = 60 * 2;
P = 120 * 1;

Ass+9
Q. 7

Count = 0;

while (x)
{

 x = x / 10;
 count++;

}

Count digits in a given numb.

x = 257

Digits = 3

x = 10528

Digits = 5

x = 257 ; x
257

x = x / 10; 25

x = x / 10; 2

x = x / 10; 0

 ++(count)
for (count = 0; x; x /= 10);
printf("Digits = %.d", count);

Assn 9

Q. 8

Check Prime no.

which has only two factors
1 and itself.

and it must be a natural
number.

1 is neither Prime nor
Composite

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

if($x \% 2 == 0$)

Not Prime

if($x \% 3 == 0$)

Not Prime

for (i=2; i <= x-1; i++)

{ if($x \% i == 0$)

{ Not Prime

break;

} }

Ass - 9
& - 9

LCM →

LCM	
4	6
8	12
12	18
16	24
20	30
24	36
28	42
32	48
36	54
40	60
44	66
48	72
52	78
⋮	⋮

```
int L, a, b;  
printf("Enter two numbers");  
scanf("%d %d", &a, &b);  
for(L=a>b?a:b; L<=a+b; L++)  
    if(L%a==0 && L%b==0)  
    {  
        printf("LCM is %d", L);  
        break;  
    }
```

$$\begin{array}{r}
 2 \overline{)4,6} \\
 2 \overline{)2\ 3} \\
 3 \overline{)1\ 3} \\
 1\ 1
 \end{array}$$

$$2 \times 2 \times 3$$

$i=2$
 $a \ b \ L = 1 \ flag = 0$
 $\text{while}(a > 1 \ \& \ b > 1)$
 $\{$
 $\quad \text{if}(a \% i == 0)$
 $\quad \quad a = a / i;$
 $\quad \quad flag = 1;$
 $\quad \}$
 $\quad \text{if}(b \% i == 0)$
 $\quad \quad b = b / i;$
 $\quad \quad flag = 1;$
 $\quad \}$
 $\quad \text{if}(flag == 1)$
 $\quad \quad L = L * i;$
 $\quad \quad flag = 0;$
 $\quad \}$
 $\quad \text{else}$
 $\quad \quad i++;$
 $\}$

3

~~Ans~~
Q. 139

$$x = \cancel{2}458$$
$$\begin{array}{r} 245 \\ 245 \end{array}$$
$$x = 0$$

$$y = 9845$$
$$\begin{array}{r} 854 \\ 854 \end{array}$$
$$8542$$

$$y = y * 10 + x \% 10; \quad x = x / 10;$$

8

$$y = y * 10 + x \% 10; \quad x = x / 10;$$

80 5

$$y = y * 10 + x \% 10; \quad x = x / 10;$$

850 + 4

$$y = y * 10 + x \% 10; \quad x = x / 10;$$

8540 + 2