BATCH

RECURSION

C AND C++

PROGRAMMING MASTERCLASS

Class - 03

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https://www.hsccrackers.com/

SCAN ME

Data Type & variable

```
#include <stdio.h>

int main (){
  int sum ;
  sum=7;
  float a=3.42;
  char g='a';
  return 0;
}
```

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Constant

```
#include <stdio.h>
#define add 8
#define a 'c'

int main (){
  const int p=9;
  printf("%c",a);
}
```

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Output

```c
#include <stdio.h>

int main (){
  printf("Hello World\n");
  printf("Hello World\n");
  printf("Hello World\n");
}
```

```c
#include <stdio.h>

int main (){
  int a;
  float b;
  printf("Hello World %d\n",7);
  printf("Hello World %d\n",a);
  printf("Hello World %d\n",&a);
  printf("Hello World %d\n",&b);
}
```

Comments

```
#include <stdio.h>

int main (){
  //int a;
  float b;
  /*printf("Hello World %d\n",7);
  printf("Hello World %d\n",a);
  printf("Hello World %d\n",&a);
  printf("Hello World %d\n",&b);*/
}
```

Printing new Line

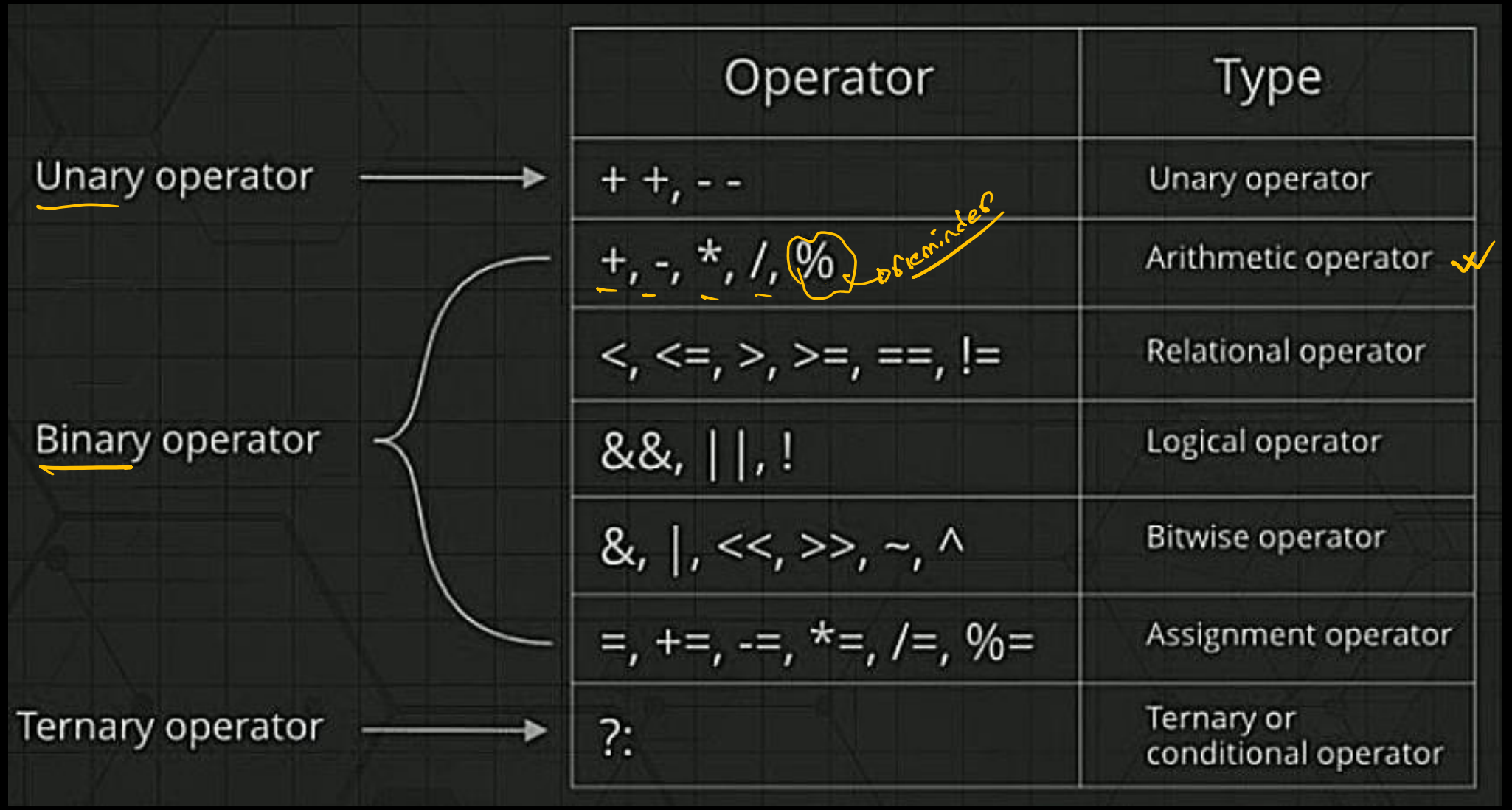
```c
#include <stdio.h>

int main (){
  printf("Hello World\n");
  printf("Hello World\n");
  printf("Hello World\n");
}
```

```c
#include <stdio.h>

int main (){
  int a;
  float b;
  scanf("%d",&a);
  printf("Hello World %d\n",7);
  printf("Hello World %d\n",a);
  printf("Hello World %d\n",&a);
  printf("Hello World %d\n",&b);
  printf("Hello World %f\n",b);
}
```

Operator



Arithmetic Operator

```c
#include <stdio.h>

int main (){
  int a=34;
  int b=5;
  int sum=a+b;
  int sub=a-b;
  int div=a/b;
  int mul=a*b;
  int rem=a%b;
  printf("sum=%d\n",sum);
  printf("sub=%d\n",sub);
  printf("rem=%d\n",rem);
  return 0;
}
```

$\Rightarrow 5*2 + 3/2*5$

$= 10 + (1*5$

$= 10+5$

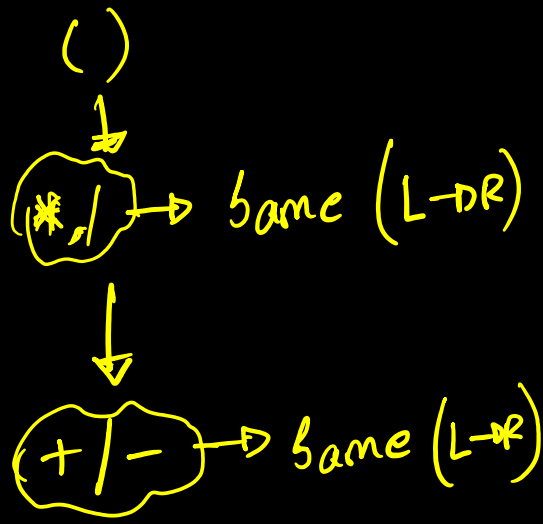
$= 15$

$\Rightarrow 5*2 + 3/(2*5)$

$\Rightarrow 10 + (3/10$

$\Rightarrow 10+0$

$\Rightarrow 10$



Type Casting

```c
#include <stdio.h>

int main (){
  int a=4;
  int b=3;
  float rem=(float)a/b;
  printf("rem=%f\n",(float)4/3);
  return 0;
}
```

```c
#include <stdio.h>

int main (){
  char alfa='c';
  int a=(int)alfa;
  printf("%d\n",a);
  return 0;
}
```

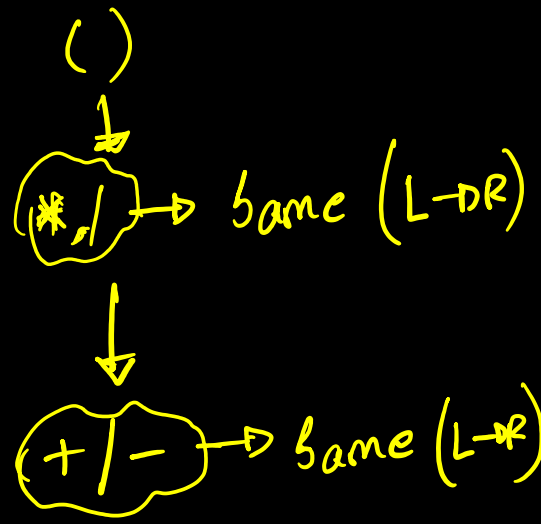
Operator Precedence

$\Rightarrow$ 5*2 + 3/2*5

= 10 + (1*5

= 10+5

= 15



$\Rightarrow$ 5x2 + 3/(2x5)

$\Rightarrow$ 10 + (3/10

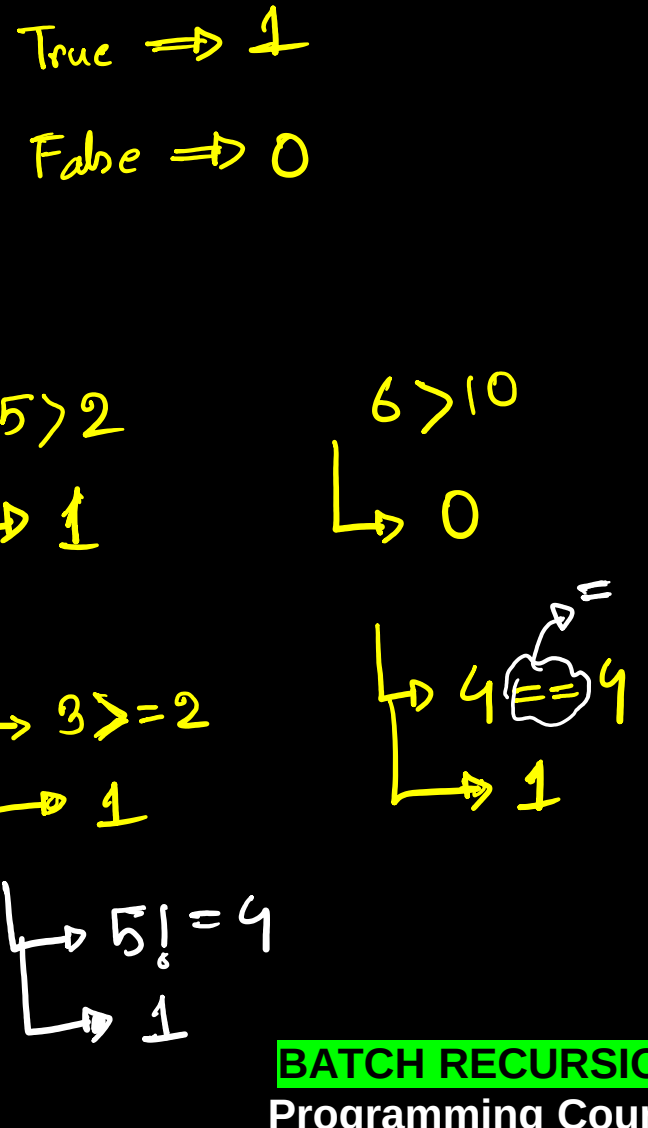
$\Rightarrow$ 10+0

$\Rightarrow$ 10

Relational Operator

```
#include <stdio.h>

int main (){
  int a=5;
  int b=6;
  int temp=a<b;
  printf("%d",temp);
  //output either 1/0;
  return 0;
}
```



Logical Operator

AND

T T = T

T F = F

F T = F

F F = F

OR

T T = T

T F = T

F T = T

F F = F

NOT

T → F

F → T

```
#include <stdio.h>

int main (){
  int a=5;
  int b=6;
  int temp=a<b;
  printf("%d\n",1&&0);
  printf("%d\n",1&&1);
  printf("%d\n",(5>2)&&(2>1));
  printf("%d\n",(5>2)&&(0>1));
  printf("%d\n",(5>2)||(0>1));
  return 0;
}
```

Assignment Operator

```c
#include <stdio.h>

int main (){
  int a=5;
  //a=a+10;
  a+=10;
  a*=10;
  a-=10;
  printf("%d\n",a);
  return 0;
}
```

Increment Decrement

```
#include <stdio.h>

int main (){
  int a=5;
  //a=a+1;
  //a+=1;
  a++;
  a--;
  printf("%d\n",a);
  return 0;
}
```

Bitwise Operator

```
#include <stdio.h>

int main (){
  printf("%d\n",7&&4);
  printf("%d\n",7&4);
  return 0;
}
```

10 => 1010
0010

10>>2

7 => 111

4 -> 100

7 & 4 => 100 => 4

7 | 4 => 111 => 7

1010<<2

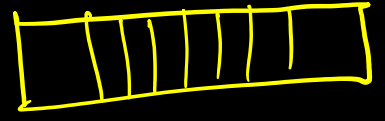
1010 00

11>>3

1011

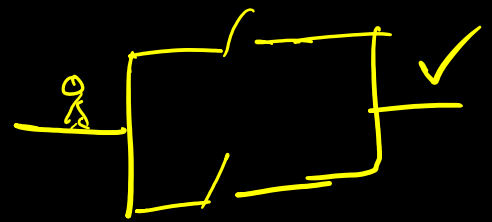
0001

<<



1001

001001



1 & 1 = 1 1 + 1 = 1

1 & 0 = 0 1 + 0 = 1

0 & 1 = 0 0 + 1 = 1

0 & 0 = 0 0 + 0 = 0

BATCH RECURSION
Programming Course

Operator Precedence

Priority	Operator
1	!
2	*, /, %
3	+, -
4	<, <=, >, >=
5	==, !=
6	&&
7	||
8	=

Problem Solving

Prob 01 : Write a C program to Print “Hello World!”

Prob 02 : Write a C program to print your name, date of birth. and mobile number.

Prob 03 : Write a C program to take 2 inputs and display their Sum

Prob 04 : Write a C program to take 2 inputs and display their multiple Calculations Sum,Division,Sub,Mul,Remainder

Prob 05 : Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches. and width of 5 inches

Expected Output:
Perimeter of the rectangle = 24 inches
Area of the rectangle = 35 square inches

Problem Solving

Prob 06 : Write a C program to compute the perimeter and area of a circle with a given radius 7

Expected Output:
Perimeter of the Circle = 37.680000 inches
Area of the Circle = 113.040001 square inches

Prob 07 : **Write a C program to compute the value of ‘a’ | take two integer input of a*b and b**

Expected :
input = 22 7
output= 3.1428

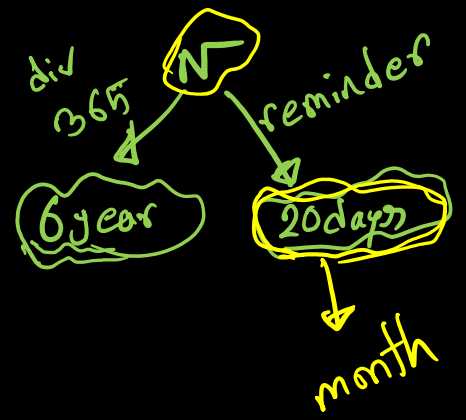
Problem Solving

Prob 08 : **Write a C program to display speed in m/s with input km/h**

Input : 36
Expected Output: 10

Prob 09 : **Write a C program to convert a given integer (in days) to years, months and days, assumes that all months have 30 days and all years have 365 days.**

Test Data :
Input no. of days: 2535
Expected Output:
6 Year(s)
11 Month(s)
15 Day(s)



Problem Solving

Prob 10 : **Write a C program to convert a given integer (in seconds) to hours, minutes and seconds.**

Test Data :
Input seconds: 25300
Expected Output:
There are: H:M:S - 7:1:40

Prob 11 : **Write a C program to display Temp in Farenhite scale while input is in Celsius**

Prob 12 : **Write a C program that accepts two item’s weight (floating points' values) and number of purchase (floating points' values) and calculate the average weight value of the items**

Test Data :
Weight - Item1: 15
No. of item1: 5
Weight - Item2: 25
No. of item2: 4
Expected Output:
Average Value = 19.444444

Problem Solving

Prob 13 : **Write a C program that accepts an employee's ID, total worked hours of a month and the amount he received per hour. Print the employee's ID and salary (with two decimal places) of a particular month.**

Test Data :
Input the Employees ID(Max. 10 chars): 0342
Input the working hrs: 8
Salary amount/hr: 15000
Expected Output:
Employees ID = 0342
Salary = U$ 120000.00

Prob 13 : **Write a C Program that accepts a 2 digit integer and and shows the total multiplications of all it's digit**

Input :
23
Expected Output:
6

Brain Teaser

Tonmoy likes beautiful value . Beautiful numbers are made by the sum of its all integer's square value .Suppose if a number is 3204 then the beautiful value is $3^2 + 2^2 + 0^2 + 4^2 = 29$.Take a input of a integer and print the beautiful value . Assume user will give you a 4 digit integer

Test Data 1:
Input : 3204
Expected Output:
Beautiful Value = 29

Test Data 2:
Input : 1001
Expected Output:
Beautiful Value = 2

Test Data 3:
Input : 9999
Expected Output:
Beautiful Value = 324

Brain Teaser

```
#include <stdio.h>
#include <math.h>

int main (){
  int temp=pow(10,3);
  printf("%d\n",temp);
  double str=sqrt(temp);
  //invalid
  //double str=pow(temp,1/2);
  printf("%lf\n",str);
  return 0;
}
```

Brain Teaser

Mirror image + 10

Test Data 1:
Input : 320
Expected Output:
Mirror = 023
Beautiful Value = 033

Test Data 2:
Input : 101
Expected Output:
Mirror = 101
Beautiful Value = 111

Test Data 3:
Input : 245
Expected Output:
Mirror = 542
Beautiful Value = 552