Homework 3

All operators with their associativity and precedence

Operator	Description	Associativity	
() [] . ->> ++ --	Parentheses or function call Brackets or array subscript Dot or Member selection operator Arrow operator Postfix increment/decrement	left to right	
++ -- + - ! ~ (type) * & sizeof	Prefix increment/decrement Unary plus and minus not operator and bitwise complement type cast Indirection or dereference operator Address of operator Determine size in bytes	right to left	

* / %	Multiplication, division and modulus	left to right	
+ -	Addition and subtraction	left to right	
<< >>	Bitwise left shift and right shift	left to right	
< <= > >=	relational less than/less than equal to relational greater than/greater than or equal to	left to right	
== !=	Relational equal to or not equal to	left to right	
&	Bitwise AND	left to right	
^	Bitwise exclusive OR	left to right	
|	Bitwise inclusive OR	left to right	
&&	Logical AND	left to right	
||	Logical OR	left to right	
? :	Ternary operator	right to left	

= += -= *= /= %= &= ^= |= <<= >>=	Assignment operator Addition/subtraction assignment Multiplication/division assignment Modulus and bitwise assignment Bitwise exclusive/inclusive OR assignment	right to left	
,	comma operator	left to right	

Highest and 2nd highest precedence operators

	Operators	Associativity
1	`( )` `[ ]` `->` `.` `++` `--` (postfix)	left to right
2	`sizeof` `&` `*` `+` `-` `~` `!` *typecasts* `++` `--` (prefix)	right to left

Question 1

```c
#include<stdio.h>
void main()
{
    int i=2,j=3,k=0;
    int p;
    p=(i,k,j);
    printf("%d\n",p);
}
```

Question 2

```c
#include<stdio.h>

void main()
{
   int ii = 10;
   ii <<= 1;
   printf("%d\n",ii);
}
```

Question 3

```
main()
{
    int var1=1,var2=12,var3=12;
    var1=var2==var3;
    printf("%d", var1);
}
```

Question 4

```c
#include<stdio.h>

main()
{
   int var = - -3;
   printf("var=%d",var);
}
```

Question 5

```c
#include<stdio.h>
main()
{
   int i = 15, j = 4, m, n;
   m = i > 9;
   n = j > 2 && j != 2;
   printf ("m = %d n = %d", m,n);
}
```

Use the code segment below for problems 6 – 9

```
int x = 7;
int y = 10;
int z = 5;
int result = 0;

result = ++y - 10 || z - 5 && x++;
result += y++ - 11 || z++ - 5 && x++;
result += y + 1 > 11 && (z++ >= 6 || x++);

printf("result: %d\n", result);
printf("x: %d\n", x);
printf("y: %d\n", y);
printf("z: %d\n", z);
```

6. Which of the following is the first line of output generated by the code segment above?
   A. `result: 0`
   B. `result: 1`
   C. `result: 2`
   D. None of the above.

7. Which of the following is the second line of output generated by the code segment above?
   A. `x: 7`
   B. `x: 8`
   C. `x: 9`
   D. None of the above.

8. Which of the following is the third line of output generated by the code segment above?
   A. `y: 11`
   B. `y: 12`
   C. `y: 13`
   D. None of the above.

9. Which of the following is the fourth line of output generated by the code segment above?
   A. `z: 5`
   B. `z: 6`
   C. `z: 7`
   D. None of the above.

Use the code segment below for problems 6 – 9

```
int x = 7;
int y = 10;
int z = 5;
int result = 0;

result = ++y - 10 || z - 5 && x++;
result += y++ - 11 || z++ - 5 && x++;
result += y + 1 > 11 && (z++ >= 6 || x++);

printf("result: %d\n", result);
printf("x: %d\n", x);
printf("y: %d\n", y);
printf("z: %d\n", z);
```

6. Which of the following is the first line of output generated by the code segment above?

A. `result: 0`
B. `result: 1`
C. `result: 2`
D. None of the above.

```
int x = 7;
int y = 10;
int z = 5;
int result = 0;

result = ++y - 10 || z - 5 && x++;
result += y++ - 11 || z++ - 5 && x++;
result += y + 1 > 11 && (z++ >= 6 || x++);

printf("result: %d\n", result);
printf("x: %d\n", x);
printf("y: %d\n", y);
printf("z: %d\n", z);
```

7. Which of the following is the second line of output generated by the code segment above?

A. `x: 7`
B. `x: 8`
C. `x: 9`
D. None of the above.

```
int x = 7;
int y = 10;
int z = 5;
int result = 0;

result = ++y - 10 || z - 5 && x++;
result += y++ - 11 || z++ - 5 && x++;
result += y + 1 > 11 && (z++ >= 6 || x++);

printf("result: %d\n", result);
printf("x: %d\n", x);
printf("y: %d\n", y);
printf("z: %d\n", z);
```

8. Which of the following is the third line of output generated by the code segment above?

A. `y: 11`
B. `y: 12`
C. `y: 13`
D. None of the above.

```
int x = 7;
int y = 10;
int z = 5;
int result = 0;

result = ++y - 10 || z - 5 && x++;
result += y++ - 11 || z++ - 5 && x++;
result += y + 1 > 11 && (z++ >= 6 || x++);

printf("result: %d\n", result);
printf("x: %d\n", x);
printf("y: %d\n", y);
printf("z: %d\n", z);
```

9. Which of the following is the fourth line of output generated by the code segment above?

A. `z: 5`
B. `z: 6`
C. `z: 7`
D. None of the above.

```
result = ++y - 10 || (z - 5 && x++);
= 11 - 10 || (z - 5 && x++)

= 1 || (z - 5 && x++);
= True || don't care
= true
```

&& has higher precedence than ||

y value will be 11 now

```
result += y++ - 11 || z++ - 5 && x++;
```

(see next page)

```
result += y++ - 11 || z++ - 5 && x++;

result += y++ - 11 || (z++ - 5 && x++);

result += 11 - 11 || (z++ - 5 && x++);

result += 0 || (z++ - 5 && x++);

result += 0 || (5 - 5 && x++);

result += 0 || (0 && x++);

result += 0 || (0 && dont care);

result += 0 || 0;

result += false

result += 0
result = result +0 = 1
```

(y is 12 now)

(z is 6 now)

Here y =12, z = 6, result =1 and x = 7

```
result += y + 1 > 11 && (z++ >= 6 || x++);

result += 12+ 1 > 11 && (z++ >= 6 || x++);

result += 13 > 11 && (z++ >= 6 || x++);

result += true && (z++ >= 6 || x++);

result += true && (6 >= 6 || x++);

result += true && (true || x++);

result += true && (true || dont care);

result += true
```

(z is 7 now)

```
result = result +1
result = 1 +1 =2
```

Finally - result =2, x = 7, y =12 and z= 7

Question 10

```
int a=1, b=3, c=1;

if( (a||c--) && (c&&b--) )
      printf("%d\n",b);


printf("%d %d %d",a,b,c);
```

Question 11

```
main()
{
    int a = 0;

    if (0 && a++ == 0)
    {
      printf("Inside if");
    }

    else
    {
      printf(”else");
    }

    printf("%d", a);

}
```

Question 12

```
int   i = 4, j = -1, k = 0, w, x, y, z ;

 w = i || j || k ;
 x = i && j && k ;
 y = i || j && k ;
 z = i && j || k ;

 printf("%d, %d, %d, %d\n", w, x, y, z);
```

A. 1, 1, 1, 1
B. 1, 1, 0, 1
C. 1, 0, 0, 1
D. 1, 0, 1, 1

Question 13

```
int main() {
    int i,j,k,l,m;

    //Line 1

    m = (i++&&j++&&k++)||l++;

    printf("i=%d  j=%d  k=%d  l=%d  m=%d\n",i,j,k,l,m);
}
```

Write down the output in each of the following cases when Line 1 is relaced by –

1. i = -1,j=-1,k=-1,l=2;

2. i = -1,j=-1,k=0,l=2;

3. i = 0,j=2,k=3,l=2;

Question 14

```c
#include<stdio.h>
main()
{
    int a,b,c,d;
    a=3;
    b=5;
    c=a,b;
    d=(a,b);
    printf("c=%d d=%d", c, d);
}
```

Question 15

```c
#include<stdio.h>
main()
{
    int a,b=2,c;

    a = 2*(b++);
    c = 2*(++b);

    printf("a = %d c = %d", a,c);
}
```

Question 16

```c
#include <stdio.h>
void main()
{
    int x = 0, y = 2, z = 3;
    int a = x & y | z;
    printf("%d", a);
}
```

a) 3
b) 0
c) 2
d) Run time error

Question 17

```c
#include <stdio.h>
int main()
{
    int a = 10, b = 5, c = 3;
    b != !a;
    c = !!a;
    printf("%d\t%d", b, c);
}
```

a) 5 1
b) 0 3
c) 5 3
d) 1 1

Question 18

```c
#include <stdio.h>
int main()
{
    int c = 2 ^ 3;
    printf("%d\n", c);
}
```

a) 1
b) 8
c) 9
d) 0

Question 19

For what is/are values program execute printf ?

```
#include <stdio.h>
int main()
{
    int i;
    scanf("%d", &i);
    if (!i == ~i) printf("same this time\n");
}
```

Question 20

```c
#include <stdio.h>
int main()
{
    int a = 2;
    if (a >> 1)
        printf("%d\n", a);
}
```

a) 0
b) 1
c) 2
d) No Output

Question 21

```
#include<stdio.h>
main()

{

    int i=0, j=1, k=2, m;

    m= i++ || j++ || k++;

    printf("%d %d %d %d", m,i,j,k);

}
```

Question 22

```
#include <stdio.h>
    void main()
    {
        int x = 1, y = 0, z = 5;

        int a = x && y || z++;

        printf("%d", z);
    }
```

Question 23

```c
#include <stdio.h>
int main()
{

    int x,i=4,j=7;

    x=j || i++ && 1;

    printf("%d",i);
}
```

Question 24

```c
#include<stdio.h>
int main()
{
    int i=-3, j=2, k=0, m;
    m = ++i && ++j && ++k;
    printf("%d, %d, %d, %d\n", i, j, k, m);
    return 0;
}
```

A. -2, 3, 1, 1
B. 2, 3, 1, 2
C. 1, 2, 3, 1
D. 3, 3, 1, 2

Question 25

```c
#include<stdio.h>
int main()
{
    int i=-3, j=2, k=0, m;
    m = ++i || ++j && ++k;
    printf("%d, %d, %d, %d\n", i, j, k,m);
    return 0;
}
```

A. 2, 2, 0, 1
B. 1, 2, 1, 0
C. -2, 2, 0, 0
D. -2, 2, 0, 1

Question 26

```
#include<stdio.h>
void main()
{
int k,i=50,j=100,l;


i=i|(j&&100);


k=i||(j||100);


l=i&(j&&100);


printf("%d %d\n",i,j);
printf("%d %d",k,l);
}
```