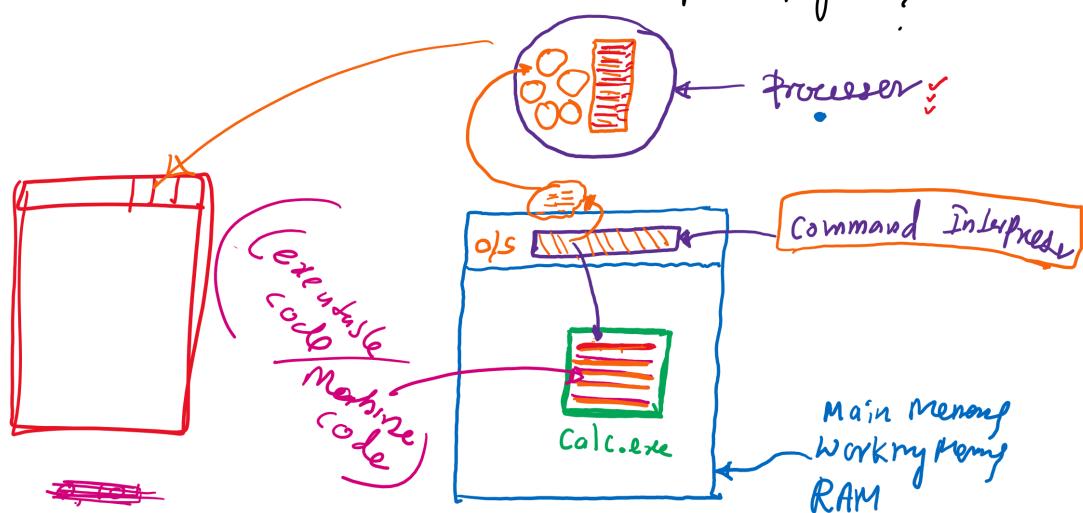
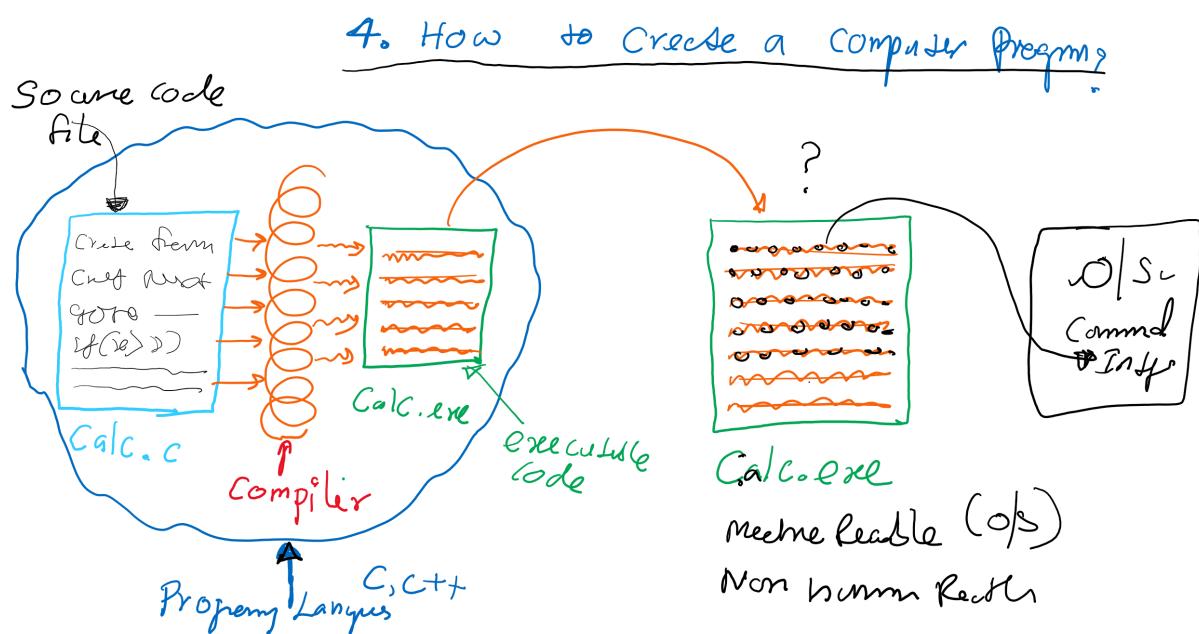
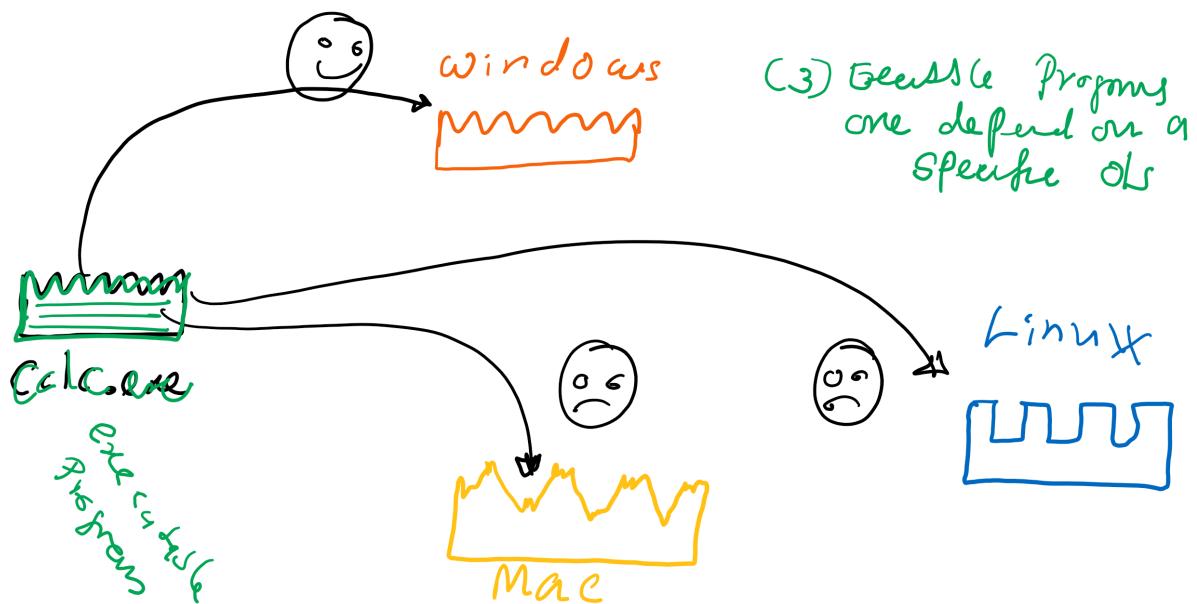
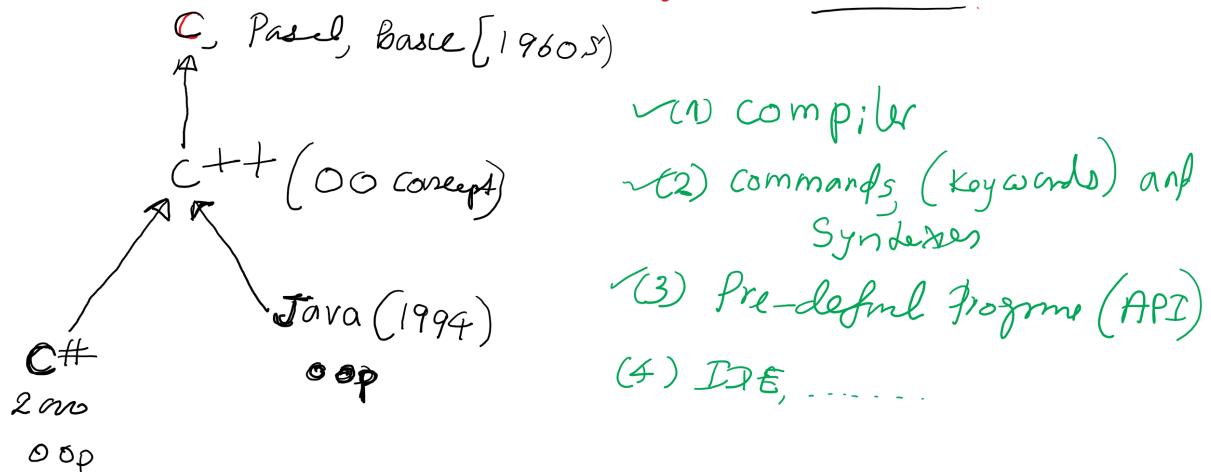


2. How to run a Computer Program?

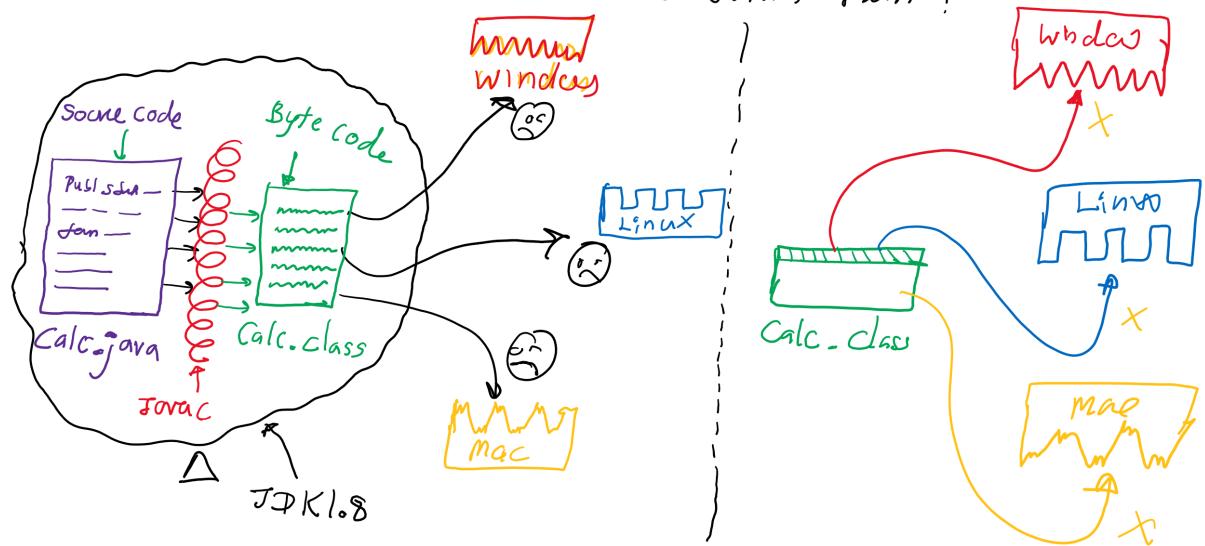




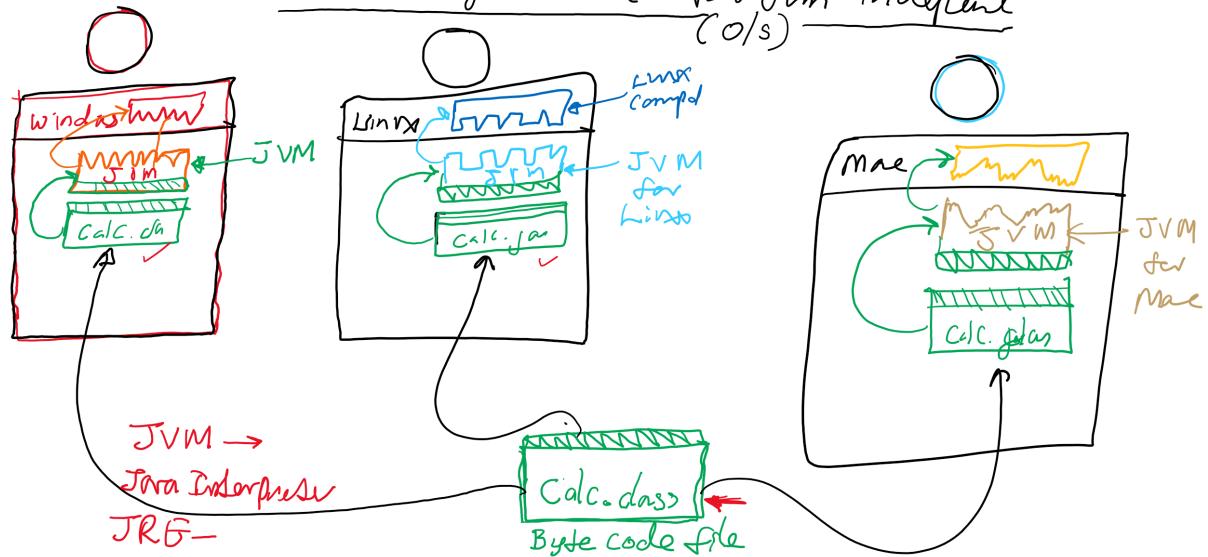
5 Programming Languages features?

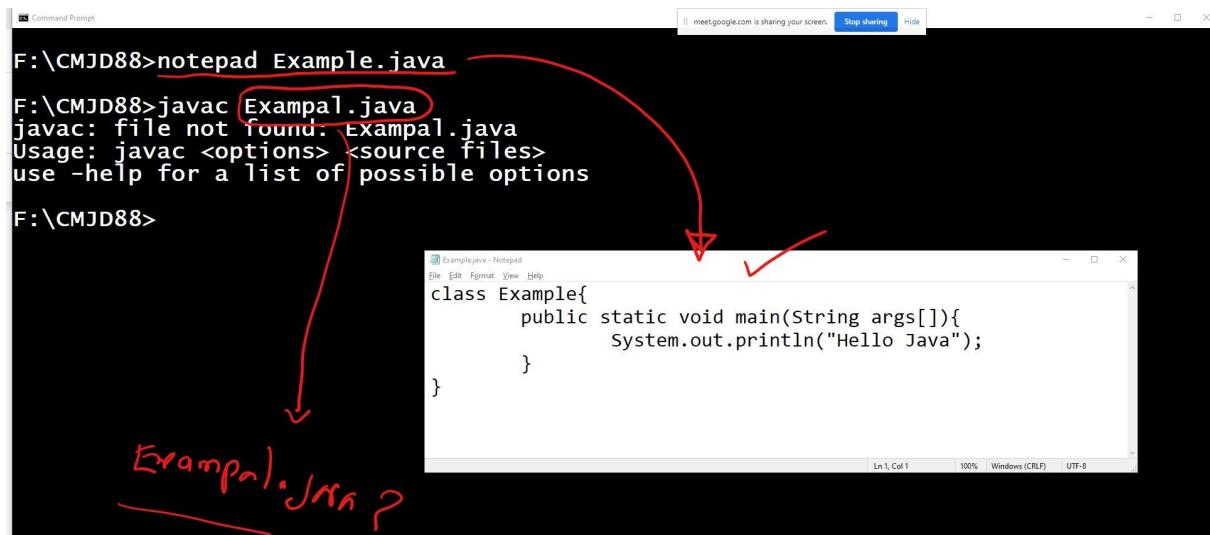
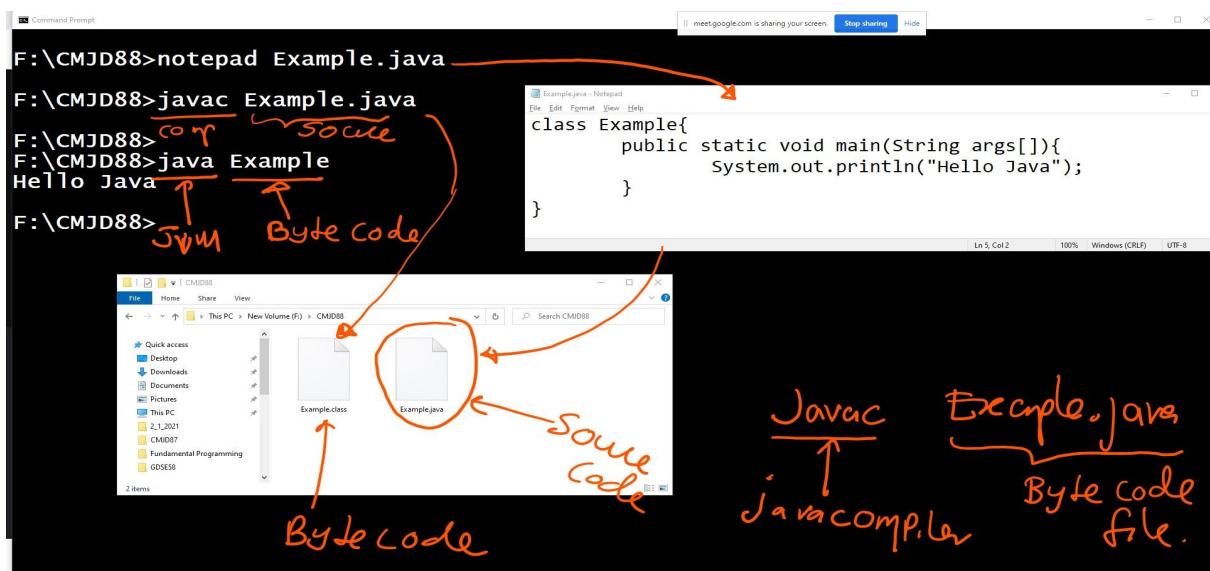


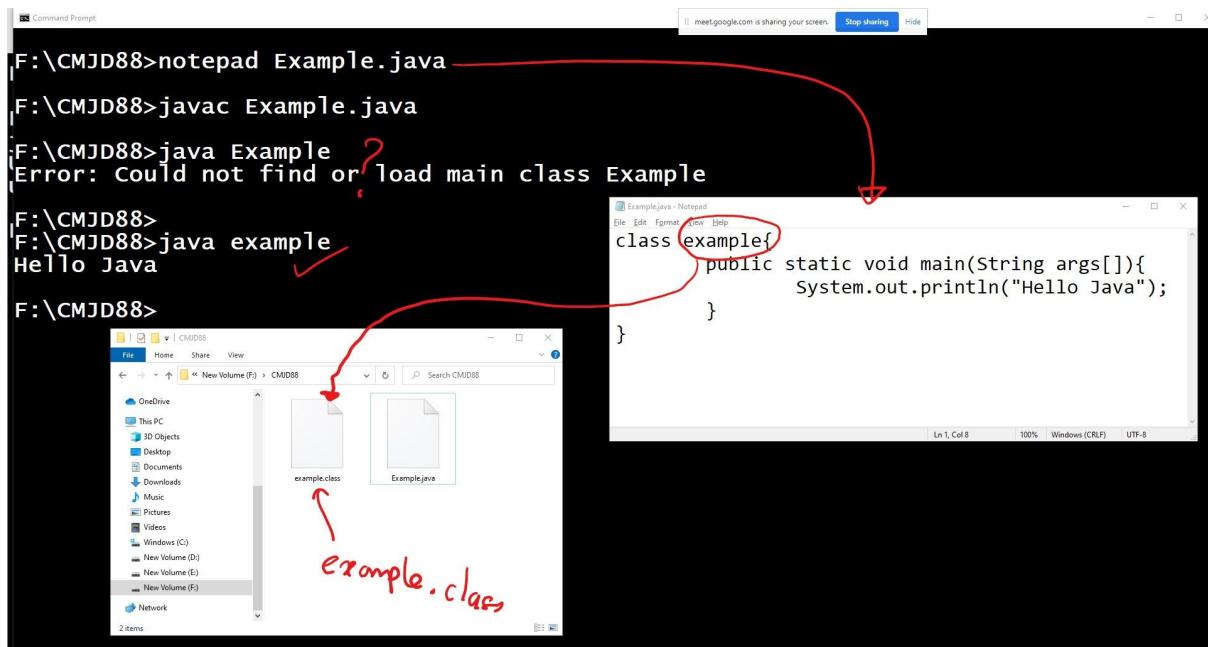
6. Create and run a Java Program ?



To Turn Programs one platform independent (O/S)







12. Legal valid main methods declarations

```
class Example{
    static public void main(String args[]){
        System.out.println("Hello Java");
    }
}
//-----
class Example{
    public static void main(String[] args){
        System.out.println("Hello Java");
    }
}
//-----
class Example{
    public static void main(String[] danapala){
        System.out.println("Hello Java");
    }
}
```

13. Legal (Compile ok) Invalid (Runtime Error)

```
class Example{
    static void main(String[] args){
        System.out.println("Hello Java");
    }
}
//-----
```

```
class Example{
    void main(String[] args){
        System.out.println("Hello Java");
    }
}
//-----

class Example{
    public static void Main(String[] args){
        System.out.println("Hello Java");
    }
}

//-----

class Example{
    public static void main(String args){
        System.out.println("Hello Java");
    }
}

//-----

class Example{
    public static void main(){
        System.out.println("Hello Java");
    }
}
```

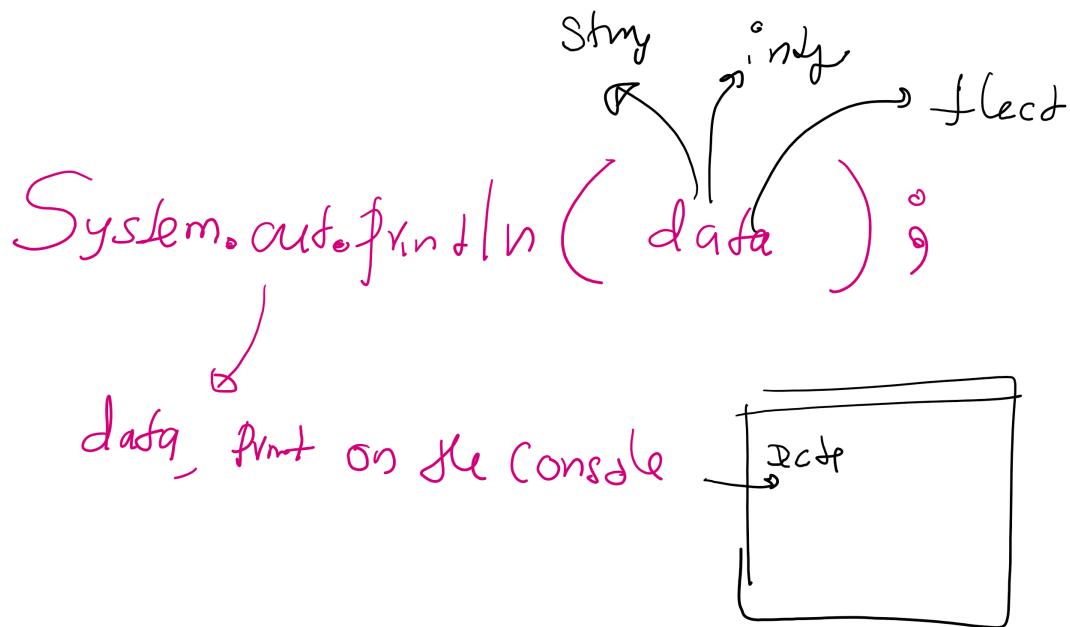
14. Illegal main method declarations

```
=====
class Example{
    public void static main(String[] args){
        System.out.println("Hello Java");
    }
}
//-----

class Example{
    public static void main(String[] ){
        System.out.println("Hello Java");
    }
}
```

15. System.out.println(data)

Q1



Q2 System.out.println(); //Prints an empty line

```
=====
class Example{
    public static void main(String args[]){
        System.out.println("A");
        System.out.println("B");
        System.out.println();
        System.out.println("C");
        System.out.println("D");
        System.out.println();
        System.out.println("E");

    }
}
```

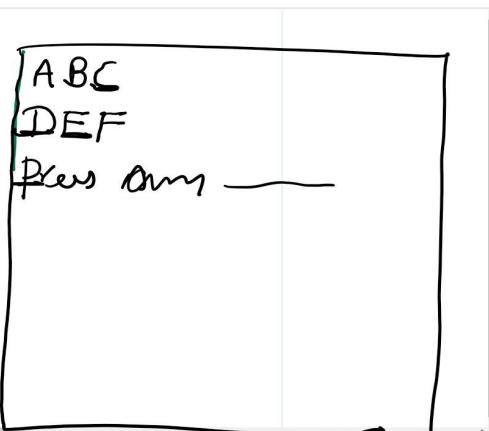
```
//////////  
Q3 System.out.print(data)  
=====  
class Example{  
    public static void main(String args[]){  
        System.out.print("A");  
        System.out.print("B");  
        System.out.print("C");  
        System.out.print("D");  
        System.out.print("E");  
    }  
}
```

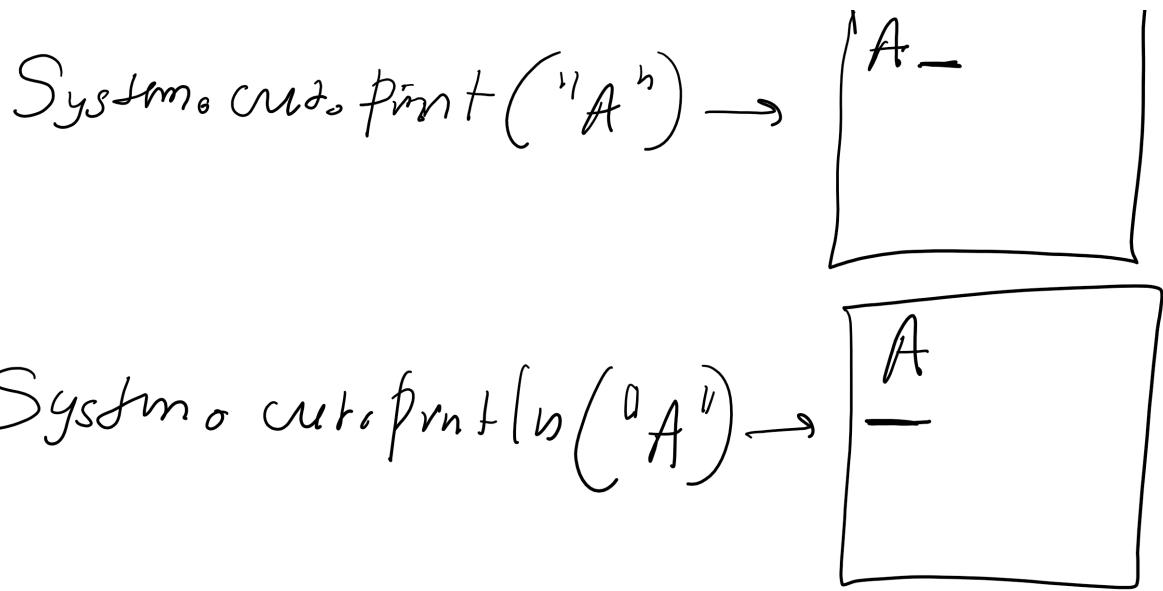
```
//////////  
Q4 Exercise  
=====
```

```
class Example{  
    public static void main(String args[]){  
        System.out.print("A");  
        System.out.print("B");  
        System.out.println("C");  
        System.out.print("D");  
        System.out.print("E");  
        System.out.println("F");  
    }  
}
```

```
class Example{  
    public static void main(String args[]){  
        System.out.print("A");✓  
        System.out.print("B");✓  
        System.out.println("C");✓  
        System.out.print("D");✓  
        System.out.print("E");✓  
        System.out.println("F");  
    }  
}
```

A_





//////////

16. Java Comments

//////////

Q5

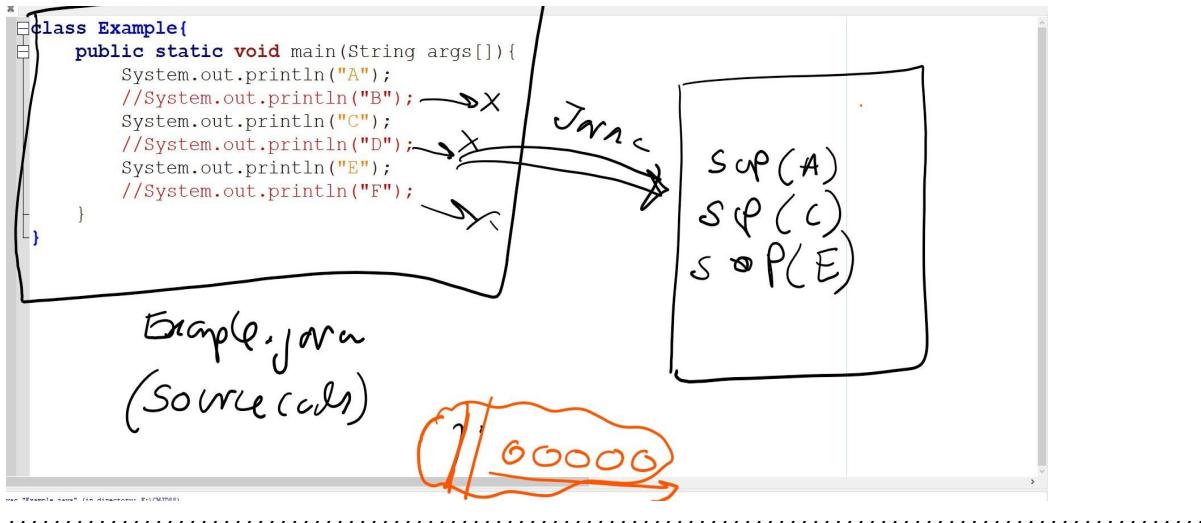
```
class Example{
    public static void main(String args[]){
        System.out.println("A");
        System.out.println("B");
        System.out.println("C");
        System.out.println("D");
        System.out.println("E");
        System.out.println("F");
    }
}
```

//////////

Q6 Line comments

=====

```
class Example{
    public static void main(String args[]){
        System.out.println("A");
        //System.out.println("B");
        System.out.println("C");
        //System.out.println("D");
        System.out.println("E");
        //System.out.println("F");
    }
}
```



Q7

```
class Example{
```

```
public static void main(String args[]){
    System.out.println("A");//Prints letter A
    System.out.println("B"); //Prints letter B
    System.out.println("C");//Prints letter C
    System.out.println("D"); //Prints letter D
    System.out.println("E");//Prints letter E
    System.out.println("F");//Prints letter F
}
```

.....

Q8 Block comments

=====
=====

```
class Example{  
    public static void main(String args[]){  
        System.out.println("A");  
        /*  
         *  
         */  
        System.out.println("B");  
        System.out.println("C");  
        System.out.println("D");  
        System.out.println("E");  
        System.out.println("F");  
    }  
}
```

```
///////////////////////////////
17. Java Literals (Simple data)
///////////////////////////////
Q9
class Example{
    public static void main(String args[]){
        System.out.println(100); //Integer Literals
        System.out.println(12345); //Integer Literals
        System.out.println(-345); //Integer Literals

        System.out.println(1.23456); //Floating point Literals
        System.out.println(-0.00346); //Floating point Literals

        System.out.println('A'); //Character Literals
        System.out.println('9'); //Character Literals
        System.out.println(9); //Integer Literals

        System.out.println(true); //Boolean Literals
        System.out.println(false); //Boolean Literals

        System.out.println("ABC");//String Literals
        System.out.println("A");//String Literals
        System.out.println("9");//String Literals
        System.out.println('9');//Character Literals
        System.out.println(9);//Integer Literals
    }
}
```

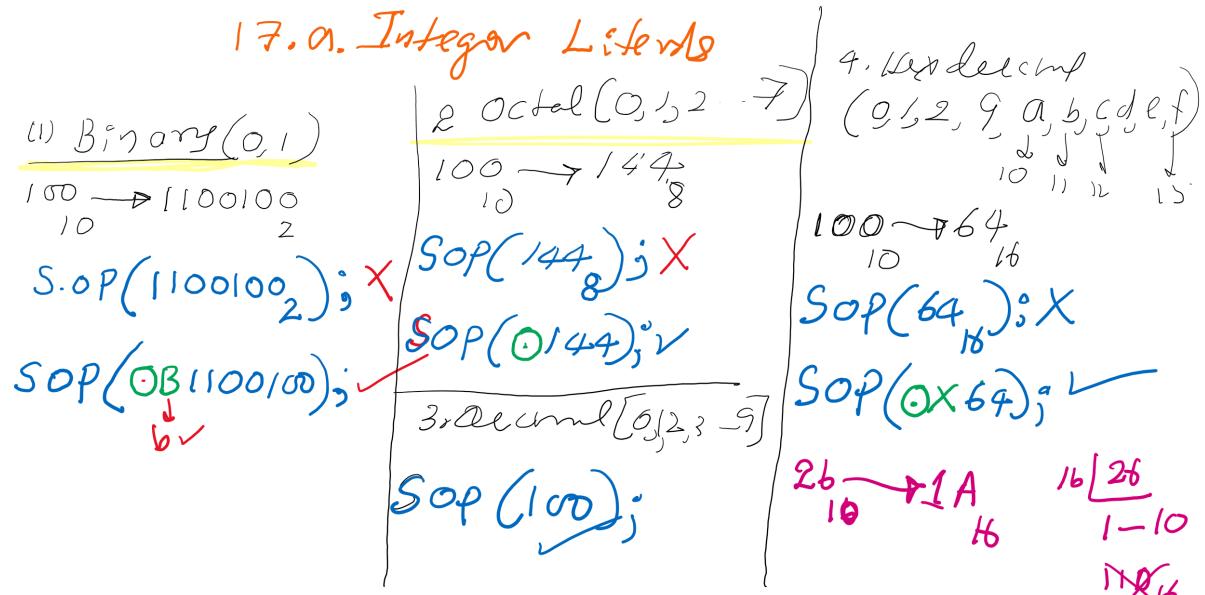
17. Java Literals

1. Integer (100, -123)
2. Floating Point (1.25, 0.005, -1.5)
3. Character ['A', '9', 'AB']
- 4 Boolean [true, false] ← Reserved word
- 5 String ["AB"]

||||||||||||||||||||||||||||||||||||||||||||

Q10 Integer Literals

=====



||||||||||||||||||||||||||||||||||||||||

Q11 Binary Literals

=====

class Example{

```

    public static void main(String args[]){
        System.out.println(1100100);
        System.out.println(0B1100100); //binary (100)
        System.out.println(0B100); //binary (4)
    }
}

```

||||||||||||||||||||||||||||||||||||

Q12

class Example{

```

    public static void main(String args[]){
        System.out.println(0B110021); //Illegal ?
    }
}

```

||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Q13 Octal Literals

=====

class Example{

```
    public static void main(String args[]){
        System.out.println(144); //prints 144
        System.out.println(0144); //prints 100, octal

        System.out.println(01234567); //prints 342391, octal
        System.out.println(0123856); //Illegal
    }
```

}

||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Q14 Hexadecimal

=====

class Example{

```
    public static void main(String args[]){
        System.out.println(64); //prints 64
        System.out.println(0x64); //prints 100
        System.out.println(0X64); //prints 100
```

System.out.println(0Xabcd); //Legal

//System.out.println(0Xabgd); //Illegal

}

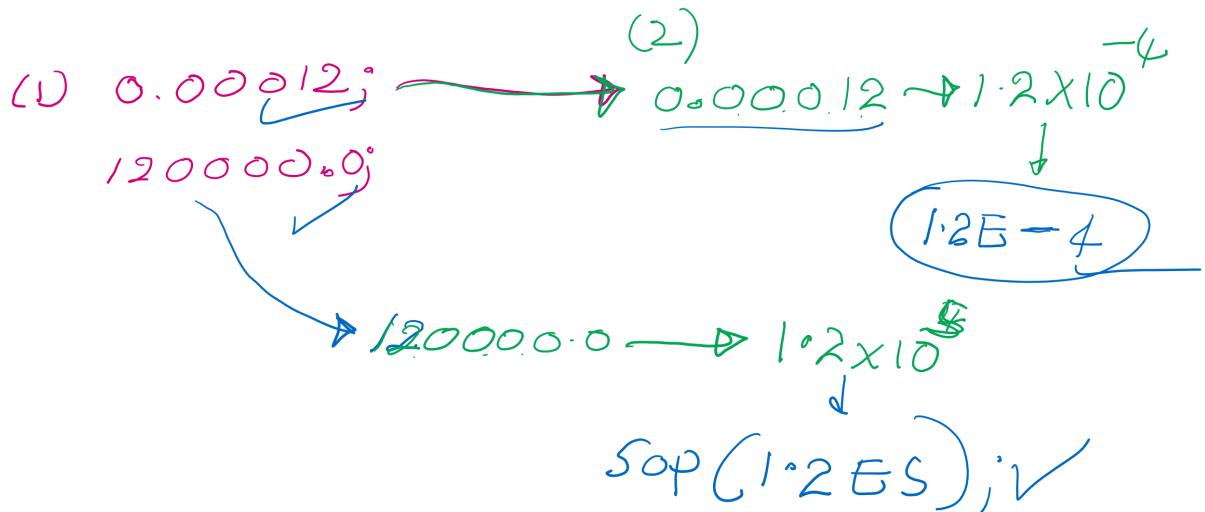
}

||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Q15 Floating-point Literals

=====

17.6 floating-point numbers



//////////

Q16

class Example{

```

    public static void main(String args[]){
        System.out.println(0.000123);
        System.out.println(120000.0);

        System.out.println(1.2E-5);
        System.out.println(1.2e7);

        System.out.println(1.2E-5>0); //true
        System.out.println(-1.2E5>0); //false
    }
}

```

//////////

Q17 Boolean Literals

=====

class Example{

```

    public static void main(String args[]){
        System.out.println(true); //boolean literals (Reserved words)
        System.out.println(false);

        System.out.println(True); //Illegal
    }
}

```

||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

18. Character Literals

18. Character Literals

`SOP('A');` `Sop(←)`
`SOP('7');` `Sop('b');` ← back space
~~`SOP('AB');` X~~ `Sop('n')` → new line } escape
 ~~tab, backspace~~ `Sop('t')` → tab key } characters
 enter key ↴

Escape Sequence	Description
\t	Inserts a tab in the text at this point.
\b	Inserts a backspace in the text at this point.
\n	Inserts a newline in the text at this point.
\r	Inserts a carriage return in the text at this point.
\f	Inserts a form feed in the text at this point.
\'	Inserts a single quote character in the text at this point.
\"	Inserts a double quote character in the text at this point.
\\\	Inserts a backslash character in the text at this point.

```
//////////  
Q18  
class Example{  
    public static void main(String args[]){  
        System.out.println('A');  
        System.out.println('7');  
        //System.out.println('AB'); //Illegal  
    }  
}
```

```
//////////  
Q19 Escape characters  
=====  
class Example{  
    public static void main(String args[]){  
        System.out.println("AB\bCD");  
        System.out.println("AB\nCD");  
        System.out.println("AB\tCD");  
    }  
}
```

```
//////////  
Q20  
class Example{  
    public static void main(String args[]){  
        System.out.print(" "); //Illegal  
  
    }  
}
```

```
//////////  
Q21  
class Example{  
    public static void main(String args[]){  
        System.out.print(" \" "); //Legal  
    }  
}
```

```
//////////  
Q22  
class Example{  
    public static void main(String args[]){  
        System.out.print("\"); //Illegal  
    }  
}
```

```
}
```

```
//////////
```

```
Q23
```

```
class Example{  
    public static void main(String args[]){  
        System.out.print("\\"); //Legal prints \  
    }  
}
```

```
//////////
```

```
Q24 Exercise
```

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        System.out.println(); //--> C:\Windows\\"Calc.exe"  
    }  
}
```

```
//////////
```

```
Q25 From Q24
```

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        System.out.println("C:\\windows\\\\\\\"Calc.exe\\\"");  
    }  
}
```

```
//////////
```

```
Q26 Exercise
```

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        System.out.println(); //-->     ^VVV^  
    }  
}
```

```
//////////
```

```
Q27 From Q26
```

```
=====
```

```

class Example{
    public static void main(String args[]){
        System.out.println("\\\\\\\\\\\\\\\\");
    }
}

```

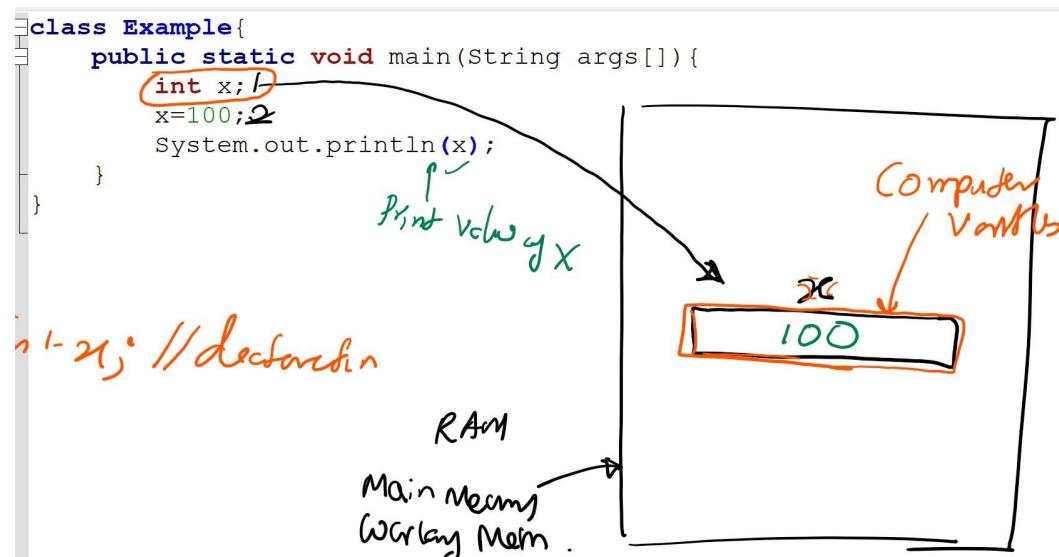
||||||||||||||||||||||||||||||||||||||
 19. Computer Variables
 ||||||||||||||||||||||||||||||||||||

Q28

```

class Example{
    public static void main(String args[]){
        int x; //Variable declaration
        x=100; //variable initialization (assign 100 to variable x)
        System.out.println(x); //print value of variable x
    }
}

```



||||||||||||||||||||||||||||||||||||||

Q29 Exercise

=====

```

class Example{
    public static void main(String args[]){
        int x;
        x=100;
        System.out.println('x'); //'x'--> character x
        System.out.println("x"); //"x"--> String x
        System.out.println(x); //x--> variable x, (print value of variable x)
    }
}

```

```
//////////  
Q30 Exercise  
=====  
class Example{  
    public static void main(String args[]){  
        int x;  
        System.out.println(x); //Initialization error  
    }  
}
```

```
//////////  
Q31 Exercise  
=====  
class Example{  
    public static void main(String args[]){  
        int x;  
        x=100;  
        x=200;  
        System.out.println(x); //PRINTS 200  
    }  
}
```

```
//////////  
Q32 eXERCISE  
=====  
class Example{  
    public static void main(String args[]){  
        int x;  
        x=100;  
        System.out.println(x);  
        x=200;  
        System.out.println(x);  
    }  
}
```

```
//////////  
Q33 Exercise  
=====  
class Example{  
    public static void main(String args[]){  
        int x=100;  
        System.out.println(x);  
        x=200;  
        System.out.println(x);
```

```
    }  
}
```

```
//////////
```

Q34 Exercise

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        int x=100;  
        System.out.println(x);  
        int y=200;  
        System.out.println(y);  
  
        int z=300;  
        System.out.println(z);  
    }  
}
```

```
//////////
```

Q35 Exercise

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        int x,y,z; //declare variables x,y,z  
        x=100; //assign 100 to x  
        y=200; //assign 200 to y  
        z=300; //assign 300 to z  
        System.out.println(x); //prints value of x  
        System.out.println(y);  
        System.out.println(z);  
    }  
}
```

```
//////////
```

Q36 Exercise

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        int x=100,y,z=300;  
        y=200; //assign 200 to y  
        System.out.println(x);  
        System.out.println(y);  
        System.out.println(z);  
    }  
}
```

```
    }  
}
```

```
//////////
```

Q37 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x,y,z;  
        x=y=z=100;  
        System.out.println(x); //prints 100  
        System.out.println(y); //prints 100  
        System.out.println(z); //prints 100  
    }  
}
```

```
//////////
```

Q38 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x=y=z=100; //Illegal  
    }  
}
```

```
//////////
```

Q39 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x=100,z=300;  
        System.out.println(x);  
        System.out.println(y);  
        System.out.println(z);  
    }  
}
```

```
//////////
```

Q40 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x=100,y=200,z=300;  
        System.out.println(x);  
        System.out.println(y);  
    }  
}
```

```
        System.out.println(z);

        x=10;
        y=20;
        int z;
        z=30;
        System.out.println(z);
    }
}
```

//////////

Q41 Exercise

=====

```
class Example{
    public static void main(String args[]){
        int x=100;
        int y=200;
        System.out.println(x);
        System.out.println(y);

        x=y;//?
        System.out.println(x);//?
        System.out.println(y);//?
    }
}
```

//////////

Q42 Exercise

=====

```
class Example{
    public static void main(String args[]){
        int x,y,z;
        x=100;
        y=200;
        z=x+y;
        System.out.println(z);
    }
}
```

//////////

Q43 Exercise

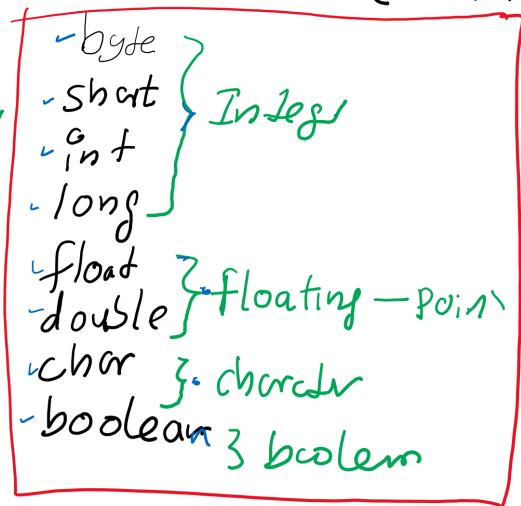
```
=====
class Example{
    public static void main(String args[]){
        int x;
        x=1.5; //Illegal
        System.out.println(x);
    }
}
```

19. Simple data types in Java

19. Simple desintegration Law (Primitive decay)

Diagram illustrating variable assignment in C:

- Variable x is assigned the value 100.
- The variable x is annotated with "integer" and "variable".
- The value 100 is enclosed in a box.



JPK → 1.0 → 1994
RAM - 4 MB / 8 MB

||||| Q44

```
class Example{
```

```
public static void main(String args[]){
    double x;
    x=1.5; //Legal
    System.out.println(x);
}
```

```
//////////  
Q45  
class Example{  
    public static void main(String args[]){  
        byte a=100;  
        short b=200;  
        int c=300;  
        long d=400;  
        System.out.println(a);  
        System.out.println(b);  
        System.out.println(c);  
        System.out.println(d);  
    }  
}
```

```
//////////  
Q46  
class Example{  
    public static void main(String args[]){  
        byte a=127;  
        System.out.println(a);  
  
        a=-128; //Legal  
        System.out.println(a); // -128  
  
        a=128; //Illegal  
        a=-129; //Illegal  
    }  
}
```

```
//////////  
Q47  
class Example{  
    public static void main(String args[]){  
        float x;  
        x=100;  
        System.out.println(x); //print 100.0  
  
        //x=1.5; //Illegal  
        x=1.5f; //or F  
        System.out.println(x); //print 1.5  
    }  
}
```

||||||||||||||||||||||||||||||||||||||||||||

Q48

```
class Example{  
    public static void main(String args[]){  
        char ch;  
        ch='A';  
        System.out.println(ch); //print A  
    }  
}
```

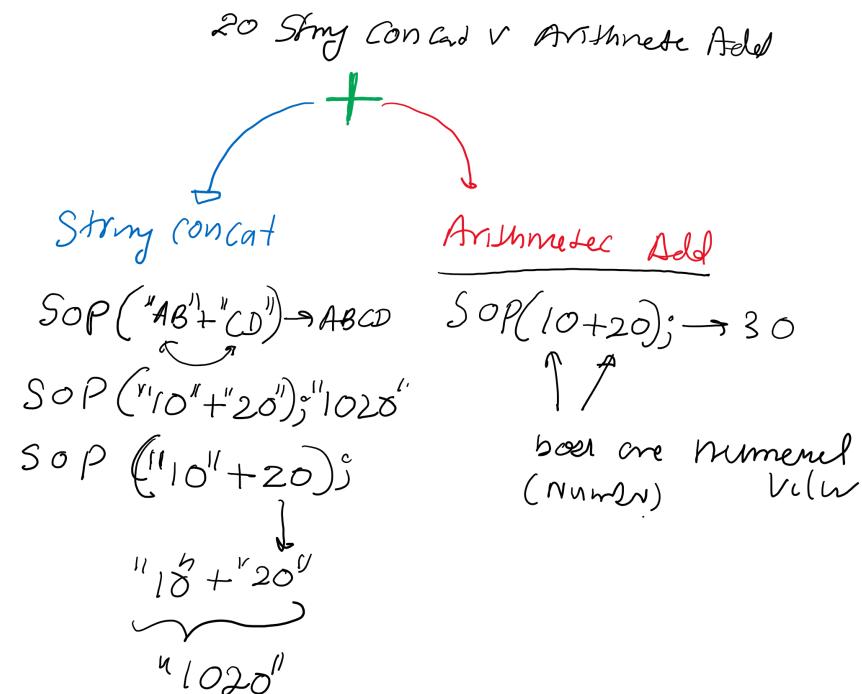
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Q49

```
class Example{  
    public static void main(String args[]){  
        boolean b;  
        b=true;  
        System.out.println(b); //print true  
    }  
}
```

||||||||||||||||||||||||||||||||||||||||

20. String concatenation vs Arithmetic addition



```
//////////  
Q50  
class Example{  
    public static void main(String args[]){  
        System.out.println("AB"+"CD"); //ABCD  
        System.out.println(10+20); //30-->arithmetic addition  
  
        System.out.println("10+20"); //-->10+20  
        System.out.println("10"+"20"); //-->1020  
        System.out.println("10"+20); //-->1020  
        System.out.println(10+"20"); //-->1020  
    }  
}
```

```
//////////  
Q51  
class Example{  
    public static void main(String args[]){  
        int x=100,y=200;  
        System.out.println("x+y");  
        System.out.println("x"+y);  
        System.out.println(x+"y");  
        System.out.println("x"+y);  
        System.out.println(x+y);  
  
    }  
}
```

```
//////////  
Q52 Exercise  
=====
```

```
class Example{  
    public static void main(String args[]){  
        System.out.println("10+20+30");  
        System.out.println("10+20"+"30");  
        System.out.println("10"+20+30);  
        System.out.println("10"+20+"30");  
        System.out.println("10"+20+30);  
        System.out.println("10"+20+"30");  
        System.out.println(10+20+"30");  
        System.out.println(10+"20"+30);  
        System.out.println("10"+20+30);  
        System.out.println(10+20+"30");  
        System.out.println(10+20+30);  
    }  
}
```

```
    }  
}
```

//////////

Q53 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int age;  
        age=20;  
        System.out.println("Age is : "+age); //Age is : 20  
    }  
}
```

//////////

Q54 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x=100,y=200;  
        System.out.println(); //100 200  
    }  
}
```

//////////

Q55 From Q54

=====

```
class Example{  
    public static void main(String args[]){  
        int x=100,y=200;  
        System.out.println(x+" "+y); //100 200  
    }  
}
```

//////////

Q56 Exercise

=====

```
class Example{  
    public static void main(String args[]){  
        int x,y,z;  
        x=100;  
        y=200;  
        z=x+y;  
        System.out.println(); //100 + 200 = 300  
    }  
}
```

```
}
```

```
//////////
```

```
Q57 From Q56
```

```
=====
```

```
class Example{
```

```
    public static void main(String args[]){  
        int x,y,z;  
        x=100;  
        y=200;  
        z=x+y;  
        System.out.println(x+" + "+y+" = "+z); //100 + 200 = 300  
    }  
}
```

```
//////////
```

```
21. Keyboard Input
```

```
//////////
```

```
Q58
```

```
import java.util.*; //or import java.util.Scanner;  
class Example{  
    public static void main(String args[]){  
        Scanner input=new Scanner(System.in);  
  
        int x,y,z;  
        x=input.nextInt();  
        y=input.nextInt();  
        z=x+y;  
        System.out.println(x+" + "+y+" = "+z);  
    }  
}
```

```
//////////
```

```
Q59
```

```
import java.util.*; //or import java.util.Scanner;  
class Example{  
    public static void main(String args[]){  
        Scanner input=new Scanner(System.in);  
  
        int x,y,z;
```

```

        System.out.println("Input number 1 : ");
        System.out.println("Input number 2 : ");
        x=input.nextInt();
        y=input.nextInt();
        z=x+y;
        System.out.println(x+" + "+y+" = "+z);
    }
}

///////////////////////////////
Q60
import java.util.*; //or import java.util.Scanner;
class Example{
    public static void main(String args[]){
        Scanner input=new Scanner(System.in);

        int x,y,z;
        System.out.print("Input number 1 : ");
        x=input.nextInt();
        System.out.print("Input number 2 : ");
        y=input.nextInt();
        z=x+y;
        System.out.println(x+" + "+y+" = "+z);
    }
}

///////////////////////////////
Q61
import java.util.*;
class Example{
    public static void main(String args[]){
        Scanner input=new Scanner(System.in);
        byte b;
        short s;
        int x;
        long y;
        float f;
        double d;
        String line;

        b=input.nextByte();
        s=input.nextShort();
        x=input.nextInt(); //***
        y=input.nextLong();
        f=input.nextFloat();
    }
}

```

```
d=input.nextDouble(); //***  
  
line=input.nextLine(); //  
  
}  
}
```

22. Java Reserved words and keywords

22. Reserved word key words



23. Identifiers

Rules for valid Identifiers

- (Identifiers)
- variable name
- int age; int my age; X
int myAge; ✓
- Key word
- ① one word
int my age; X
int myAge; ✓
- ② a-z, A-Z, 0-9, \$, _
int X, X; ✓
- ③ Can be any length
- ④ No Reserved/Key word can be used

//////////

Q63

class Example{

```
public static void main(String args[]){
    //int customer code; //Illegal
    int customerCode; //Legal
    int customer_code; //Legal
}
```

//////////

Q64

class Example{

```
public static void main(String args[]){
    int abcd;
    double average$; //
    double $average; //Legal

    int _abcd; //Legal
    //int _;
    //int __;
    //int item&code; //Illegal
}
```

```
//////////  
Q65  
class Example{  
    public static void main(String args[]){  
        int x;  
        int byte ;//Illegal, byte-->keyword  
    }  
}
```

```
//////////  
Q66  
class Example{  
    public static void main(String args[]){  
        int x1,x2,x3;//Legal  
        int 2count; //Illegal  
    }  
}
```

```
//////////  
Q67  
class Example{  
    public static void main(String args[]){  
        int x;  
        int X;  
  
    }  
}
```

```
//////////  
Unicode Characters
```

```
=====
```

```
class Example{  
    public static void main(String args[]){  
        char ch='A';  
        System.out.println(ch); //prints A  
        ch=97; //ASCII of a  
        System.out.println(ch); //prints a  
  
        System.out.println(65); //Integer Literals  
        System.out.println('\u0041'); //Unicode Character Literals A  
  
        char \u0061; //char a;  
        \u0061='\u0061';  
        System.out.println(\u0061); //prints a  
  
        // \u0061--> unicode character a
```

```
// '\u0061'-> unicode character literal 'a'  
}  
}
```