1. A. n^3

B. nlog(n)

C. n^2

D. 2^n

2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | O(n) | O(n^2) | O(n^3) | O(2^n) |
| 1000 | 5 | 5 | 5 | 5 |
| 2000 | 10 | 20 | 40 | Can’t compute |
| 3000 | 15 | 45 | 135 | Very large |
| 10000 | 50 | 500 | 5000 | Very large |

3.//code sample of it

smallest=array1[0];

**for**(**int** c=1;c<n-1;c++){

**if**(smallest>array1[c]){

smallest=array1[c];

}

}

Growth rate for this algorithm is n.

Algorithm cycles for n-2 times and does 1 check.

4. // code

**import** java.util.\*;

**public** **class** LAB3 {

**public** **static** **void** main(String[] args) {

Random a=**new** Random();

ArrayList<Integer> alist=**new** ArrayList();

ArrayList<Integer> alist2=**new** ArrayList();

**for**(**int** x=0;x<10;x++){

alist.add(a.nextInt(10));

}

System.***out***.println(alist);

**for**(**int** x=0;x<alist.size();x++){

**if**(alist2.contains(alist.get(x))){

;

}

**else**

alist2.add(alist.get(x));

}

alist.clear();

alist.addAll(alist2);

System.***out***.println(alist);

System.***out***.println(alist2);

}

}

5.

**import** java.util.\*;

**public** **class** LAB3 **implements** Comparable {

**public** **static** **void** main(String[] args){

Random a=**new** Random();

Integer[] alist=**new** Integer[15];

Integer[] alist2=**new** Integer[15];

**for**(**int** x=0;x<15;x++){

alist[x]=a.nextInt(30);

alist2[x]=a.nextInt(30);

}

InsertionSort.*InsertionSort*(alist);

BinarySearcher temp=**new** BinarySearcher(alist);

**for**(**int** x=0;x<15;x++){

**if**(temp.BinarySearch(alist2[x])<0){

System.***out***.println("Yes "+alist[x]+" is in common in the original list");

}

}

}

}

The program loops for n times and does a binary search of log n times.

6. **import** java.util.\*;

**public** **class** LAB3 **implements** Comparator<String> {

**static** String[] *one*=**new** String[5];

**public** **static** **void** main(String[] args) {

*one*[0]="54321";

*one*[1]="123";

*one*[2]="4444";

*one*[3]="12";

*one*[4]="1";

Arrays.*sort*(*one*);

**for**(**int** x=0;x<5;x++){

System.***out***.println(*one*[x].toString());

}

}

**public** **int** compare(String s1, String s2){

**return** s1.length()-s2.length();

}

}