Міністерство освіти, науки, молоді та спорту України
Національний університет «Львівська політехніка»

Кафедра СШІ

Лабораторна робота №2

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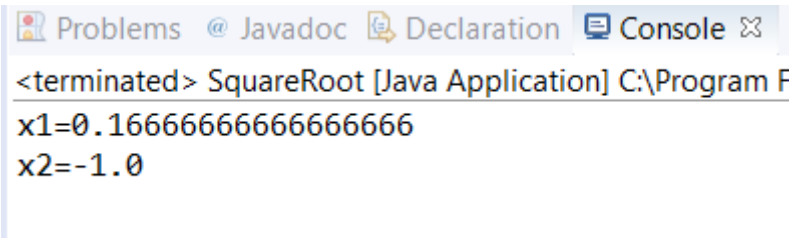
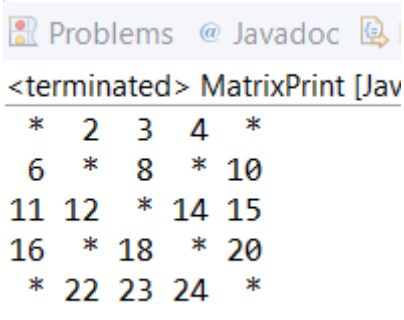
2.1



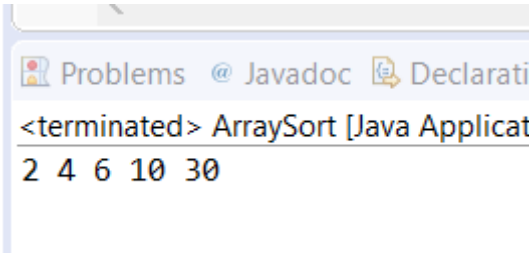

```
public class SquareRoot
{
    public static void main(String args [])
    {
     double a = 3;
     double b = 2.5;
     double c = -0.5;
     double D = b*b - 4*a*c;
     double x1, x2;
     if(Math.sqrt(D) > 0)
     {
      if((2*a) == 0)
      {
       System.out.print("x1=0.0\nx2=0.0\n");
      }
      else
      {
      x1 = (-b + Math.sqrt(D))/(2*a);
      x2 = (-b - Math.sqrt(D))/(2*a);
      System.out.print("x1="+x1+"\n"+"x2="+x2+"\n");
      }
     }
     else if(Math.sqrt(D) < 0)
     {
      System.out.print("x1= \nx2= \n");
     }
     else if(Math.sqrt(D) == 0)
     {
      if((2*a) == 0)
      {
       System.out.print("x1=\nx2=\n");
      }
      else
      {
      x1 = (-b + Math.sqrt(D))/(2*a);
      x2 = (-b - Math.sqrt(D))/(2*a);
      System.out.print("x1="+x1+"\n"+"x2="+x2+"\n");
      }
     }

    }
}
```

2.2



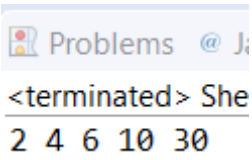
```
public class MatrixPrint
{

 public static void main(String[] args)
 {
  int [][] M = new int [5][5];
  M[0][0] = 0;
  M[0][1] = 2;
  M[0][2] = 3;
  M[0][3] = 4;
  M[0][4] = 0;
  M[1][0] = 6;
  M[1][1] = 0;
  M[1][2] = 8;
  M[1][3] = 0;
  M[1][4] = 10;
  M[2][0] = 11;
  M[2][1] = 12;
  M[2][2] = 0;
  M[2][3] = 14;
  M[2][4] = 15;
  M[3][0] = 16;
  M[3][1] = 0;
  M[3][2] = 18;
  M[3][3] = 0;
  M[3][4] = 20;
  M[4][0] = 0;
  M[4][1] = 22;
  M[4][2] = 23;
  M[4][3] = 24;
  M[4][4] = 0;
  for(int i = 0; i < 5; i++)
  {
   for(int j = 0; j < 5; j++)
   {
    if(M[i][j] == 0)
    {
     System.out.print(" * ");
    }
    else
    {
     if(M[i][j] > 10)
     {
      System.out.print(M[i][j] + " ");
     }
     else if(M[i][j] < 10 && M[i][j] > 1)
     {
      System.out.print(" "+ M[i][j] + " ");
     }
     else
     {
      System.out.print(10 + " ");
     }

    }
   }
   System.out.println();
  }

 }

}
```

2.3



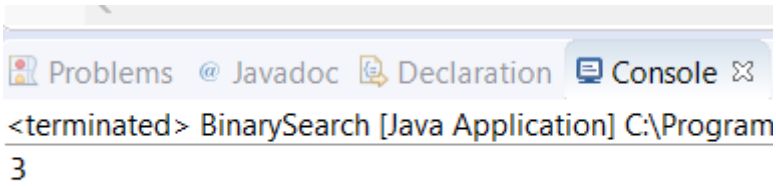

```
public class ArraySort {

 public static void main(String[] args){
  int[] array = {30, 2, 10, 4, 6};
  int length = array.length;
  int j = 0;
  int t;
  while(j < length - 1)
  {
   if(array[j+1] >= array[j])
   {
    ++j;
   }
   else
   {
    t = array[j];
    array[j] = array[j+1];
    array[j+1] = t;
    j = 0;
   }
  }


  for (int i = 0; i < length; i++) {
   System.out.print(array[i] + " ");
  }
    }
}
```

2.4




```
public class ShellSort {

 public static void main(String[] args) {
  int[] array = {30, 2, 10, 4, 6};
  int length = array.length;
  for(int d = length/2; d >= 1; d /= 2)
  {
   for (int i = d; i < length; i++)
   {
    for (int j = i; j >= d && array[j-d] > array[j]; j -= d)
    {
     int t = array[j];
     array[j] = array[j-d];
     array[j-d] = t;
    }
   }
  }
  for (int i = 0; i < length; i++) {
   System.out.print(array[i] + " ");
  }
 }
}
```

2.5




```java
public class BinarySearch {

 public static void main(String[] args) {

  int data[] = { 3, 6, 7, 10, 34, 56, 60 };
  int numberToFind = 10;
  int averageIndex = 0;
  int firstIndex = 0;
  int lastIndex = data.length-1;
  while(firstIndex < lastIndex)
  {
   averageIndex = firstIndex + (lastIndex - firstIndex) / 2;
   if(numberToFind <= data[averageIndex])
   {
    lastIndex = averageIndex;
   }
   else
   {
    firstIndex = averageIndex + 1;
   }
  }
   if(data[lastIndex] == numberToFind)
   {
    System.out.println(lastIndex);
   }
   else
   {
    System.out.println(-1);
   }
 }
}
```