

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1Challenge 11
Problem	<p>Question description</p> <p><i>Zach and Miller are preparing themselves for programming contests.</i></p> <p>An important part of preparing for a competition is sharing programming knowledge from the experienced members to those who are just beginning to deal with the contests. Therefore, during the next team training Zach decided to make teams so that newbies are solving problems together with experienced participants.</p> <p>Zach believes that the optimal team of three people should consist of one experienced participant and two newbies. Thus, each experienced participant can share the experience with a large number of people.</p> <p>However, Miller believes that the optimal team should have two experienced members plus one newbie. Thus, each newbie can gain more knowledge and experience.</p> <p>As a result, Zach and Miller have decided that all the teams during the training session should belong to one of the two types described above. Furthermore, they agree that the total number of teams should be as much as possible.</p> <p>There are <math>n</math> experienced members and <math>m</math> newbies on the training session. Can you calculate what maximum number of teams can be formed?</p> <p>Constraints:</p> $0 \leq n, m \leq 5 \cdot 10^5$ <p>Input Format:</p> <p>The first line contains two integers <math>n</math> and <math>m</math> — the number of experienced participants and newbies that are present at the training session.</p> <p>Output Format:</p> <p>Print the maximum number of teams that can be formed.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010042 {

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        int n,m;

        n = in.nextInt();

        m = in.nextInt();

        int s = Math.min((n+m)/3,(n*m)/3);

        System.out.println(s);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1Challenge 12
Problem	<p>Question description</p> <p>Carlos and his little brother Damian are been watching a movie in television , the advertisements in between are very long and boring so Carlos gave Damian a rectangle of length <math>x</math> and width <math>y</math>. Damian is required to determine a circle that contains the maximum circumference that fits inside the rectangle. This type of circle is called a big circle. Damian's task is to determine the maximum number of big circles that can fit inside the rectangle.</p> <p>Can you help him?</p> <p>Constraints:</p> $1 \leq x, y \leq 10^9$ <p>Input format:</p> <p>First line of input contains two integers <math>x</math> and <math>y</math></p> <p>Output format:</p> <p>Print the answer on a new line denoting the maximum number of big circles that can fit in the provided rectangle.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010042{

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

```

        int x,y;

        int t;

Scanner sc=new Scanner(System.in);

x=sc.nextInt();

y=sc.nextInt();

t=(x>y)?x/y:y/x;

System.out.println(t);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 13
Problem	<p>Question description:</p> <p>Kenneth is playing in a T20 cricket match. In a match, Team A plays for 20 overs. In a single over, the team gets to play 6 times, and in each of these 6 tries, they can score a maximum of 6 runs. After Team A's 20 overs are finished, Team B similarly plays for 20 overs and tries to get a higher total score than the first team. The team with the higher total score at the end wins the match.</p> <p>Kenneth is in Team B. Team A has already played their 20 overs, and have gotten a score of R. Kenneth's Team B has started playing, and have already scored C runs in the first O overs. In the remaining 20-O overs, find whether it is possible for Kenneth's Team B to get a score high enough to win the game. That is, can their final score be strictly larger than R?</p> <p>Constraints:</p> <ul style="list-style-type: none"> <li>• <math>0 \leq C \leq R \leq 720</math></li> <li>• <math>1 \leq O \leq 19</math></li> <li>• <math>0 \leq C \leq 36 * O</math></li> </ul> <p>Input Format:</p> <p>There is a single line of input, with three integers, R,O,C</p> <p>Output Format:</p> <p>Output in a single line, the answer, which should be "YES" if it's possible for Kenneth's Team B to win the match and "NO" if not.</p>				

```

import java.util.*;

public class Class232241010042 {

    public static void main(String[] args) {

        int r,o,c;

        String str;

Scanner input = new Scanner(System.in);

r = input.nextInt();

o = input.nextInt();

c = input.nextInt();

int run = 20 - o;

int result = 36 * run;

int sum = c + result;

str =(r < sum) ? "YES" : "NO";{

    System.out.println(str);

```

```

    }

}

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 • Challenge 14
<b>Problem</b>	<p>Question description</p> <p>Being a nonconformist, Shankar is displeased with the current state of things, particularly with the order of natural numbers (natural number is positive integer number). He is determined to rearrange them. But there are too many natural numbers, so Shankar decided to start with the first <math>n</math>. He writes down the following sequence of numbers: firstly all odd integers from 1 to <math>n</math> (in ascending order), then all even integers from 1 to <math>n</math> (also in ascending order). Help our hero to find out which number will stand at the position number <math>k</math>.</p> <p>Constraints:</p> $1 \leq k \leq n \leq 10^{12}$ <p>Input Format:</p> <p>The only line of input contains integers <math>n</math> and <math>k</math>.</p> <p>Output Format:</p> <p>Print the number that will stand at the position number <math>k</math> after Shankar's manipulations.</p>				

```

import java.io.*;

import java.util.Scanner;

public class Class232241010042 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        long n,k;

        n=sc.nextInt();

        k=sc.nextInt();

        long sum = (k <= (n + 1) / 2) ? (k* 2 - 1):((k - (n + 1)/ 2)* 2);

        System.out.println(sum);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	● Level 1 ● Challenge 15
Problem	<p>Question description</p> <p>Felix starts with an integer <math>n</math>.</p> <p>In one move, he can perform one of the following operations:</p> <ul style="list-style-type: none"><li>• divide <math>n</math> by one of its proper divisors, or</li><li>• subtract 1 from <math>n</math> if <math>n</math> is greater than 1.</li></ul> <p>A proper divisor is a divisor of a number, excluding itself. For example, 1, 2, 4, 5, and 10 are proper divisors of 20, but 20 itself is not.</p> <p>What is the minimum number of moves Felix is required to make to reduce <math>n</math> to 1?</p> <p>Constraints:</p> $1 \leq n \leq 10^9$ <p>Input Format:</p> <p>The only line of each test case contains a single integer <math>n</math>.</p> <p>Output Format:</p> <p>For each test case, output the minimum number of moves required to reduce <math>n</math> to 1.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010042 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int n = input.nextInt();


        int m = Math.min(n&1,0);

        int s = (n%2==0)?(2):(3);

        System.out.println(s);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	● Level 1 ● Challenge 16
Problem	<p>Question description</p> <p>You all probably know how to calculate the distance between two points in two dimensional cartesian plane. But in this problem you have to find the minimum arc distance between two points and they are on a circle centered at another point.</p> <p>You will be given the co-ordinates of the points A and B and co-ordinate of the center O. You just have to calculate the minimum arc distance between A and B. In the picture, you have to calculate the length of arc ACB. You can assume that A and B will always be on the circle centered at O.</p>  <p>Constraints:</p> $1 \leq O_x, O_y \leq 10000$ $1 \leq A_x, A_y, B_x, B_y \leq 10000$ <p>Input Format:</p> <p>Each case starts with a line containing six integers <math>O_x, O_y, A_x, A_y, B_x, B_y</math> where <math>(O_x, O_y)</math> indicates the co-ordinate of O, <math>(A_x, A_y)</math> denote the co-ordinate of A and <math>(B_x, B_y)</math> denote the co-ordinate of B.</p> <p>Output Format:</p> <p>Print the case number and the minimum arc distance rounder off to 4 decimal places</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010042 {
```

```

public static void main(String[] args) {

    Scanner sc = new Scanner(System.in);

    double r,ab,s,ox,oy,ax,ay,bx,by,alpha,result;

    ox=sc.nextDouble();

    oy=sc.nextDouble();

    ax=sc.nextDouble();

    ay=sc.nextDouble();

    bx=sc.nextDouble();

    by=sc.nextDouble();

    r=Math.sqrt(Math.pow((ox-ax),2)+Math.pow((oy-ay),2));

    ab=Math.sqrt(Math.pow((ax-bx),2)+Math.pow((ay-by),2));

    result=(r*r+r*r-ab*ab)/(2.0*r*r);

    alpha=Math.acos(result);

    s=r*alpha;

    System.out.println(String.format("%.4f",s));

}
}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	• Level 1 • Challenge 17
Problem	<p>Question description:</p> <p>Franklin has unlimited number of coins with values <math>1, 2, \dots, n</math>. He wants to select some set of coins having the total value of <math>S</math>.</p> <p>It is allowed to have multiple coins with the same value in the set. What is the minimum number of coins required to get sum <math>S</math>?</p> <p>Can you calculate that for him quickly?</p> <p>Constraints:</p> <p><math>1 \leq n \leq 100000</math></p> <p><math>1 \leq S \leq 10^9</math></p> <p>Input Format:</p> <p>The only line of the input contains two integers <math>n</math> and <math>S</math></p> <p>Output Format:</p> <p>Print exactly one integer - the minimum number of coins required to obtain sum <math>S</math>.</p>				

```

import java.io.*;

import java.util.*;

public class Class232241010042{

    public static void main(String[] args){

        Scanner sc= new Scanner(System.in);

        int n=sc.nextInt();

        int s=sc.nextInt();

```

```

int k1,k2,t;

k1=s/n;

k2=s%n;

t=(k2==0)?k1:k1+1;

System.out.println(t);

}

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 18</div> </div>
Problem	<p>Question description</p> <p>Stormwind Basketball Cup starts really soon! Commentators from all over the world come to the event.</p> <p>Organizers have already built <math>n</math> commentary boxes. <math>m</math> regional delegations will come to the Cup. Every delegation should get the <i>same number</i> of the commentary boxes. If any box is left unoccupied then the delegations will be upset. <i>So each box should be occupied by exactly one delegation.</i></p> <p>If <math>n</math> is not divisible by <math>m</math>, it is impossible to distribute the boxes to the delegations at the moment.</p> <p>Organizers can build a new commentary box paying <math>a</math> dollars and demolish a commentary box paying <math>b</math> dollars. They can both build and demolish boxes arbitrary number of times (each time paying a corresponding fee). It is allowed to demolish all the existing boxes.</p> <p>What is the minimal amount of dollars organizers should pay to satisfy all the delegations (i.e. to make the number of the boxes be divisible by <math>m</math>)?</p> <p>Constraints:</p> <p><math>1 \leq n, m \leq 10^{12}</math></p> <p><math>1 \leq a, b \leq 100</math></p> <p>Input Format:</p> <p>The only line contains four integer numbers <math>n, m, a, b</math>, where <math>n</math> is the initial number of the commentary boxes, <math>m</math> is the number of delegations to come, <math>a</math> is the fee to build a box and <math>b</math> is the fee to demolish a box.</p> <p>Output Format:</p> <p>Output the minimal amount of dollars organizers should pay to satisfy all the delegations (i.e. to make the number of the boxes be divisible by <math>m</math>). It is allowed that the final number of the boxes is equal to 0.</p>				

```

import java.util.*;

public class Class232241010042 {

    public static void main(String[] args) {

        Scanner in=new Scanner(System.in);

        int n,m,a,b;

        int box=0;

        n=in.nextInt();

        m=in.nextInt();

        a=in.nextInt();

        b=in.nextInt();

        if(n%m==0){

            System.out.println(0);

        }

        box=Math.min(b*(n%m),(m-n%m)*a);

```

```

        System.out.println(box);
    }
}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div></div> Level 1 </div> <div> <div></div> Challenge 19 </div>
Problem	<p>Question description</p> <p>During the La Liga Match between Real Madrid and Barcelona, as a part of La Liga contest the question was asked to the fans.</p> <p>Who are all giving the correct answer to that question will get the free VIP box ticket for the Final for which Atletico Madrid have already qualified .</p> <p>The question is to take two numbers N and M as input and print the boolean value as "True" or "False" whether N is greater than or lesser than M and vice versa.</p> <p>Constraints</p> <p><math>1 \leq N \leq 100</math></p> <p><math>1 \leq M \leq 100</math></p> <p>Input Format:</p> <p>Single line input of two numbers N and M separated by a space</p> <p>Output Format:</p> <p>The corresponding boolean value as "True" or "False" after checking the condition</p>				

```

import java.io.*;

import java.util.*;

public class Class232241010042 {

    public static void main(String[] args) {

        Scanner r = new Scanner(System.in);

        int a = r.nextInt();

        int b = r.nextInt();

        {

            System.out.println(a >= b);

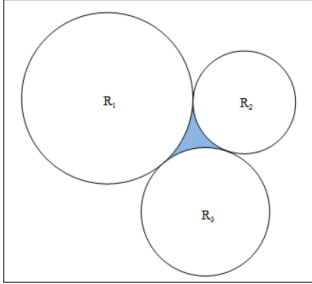
            System.out.println(a <= b);

        }

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 20
Problem	<p><b>Question description</b></p> <p>Agent Hitman 47 is preparing to steal an antique diamond piece from a museum. As it is fully guarded and they are guarding it using high technologies, it's not easy to steal the piece. There are three circular laser scanners in the museum which are the main headache for Agent Hitman 47. The scanners are centered in a certain position, and they keep rotating maintaining a certain radius. And they are placed such that their coverage areas touch each other as shown in the picture below:</p>  <p>Here <math>R_1</math>, <math>R_2</math> and <math>R_3</math> are the radii of the coverage areas of the three laser scanners. The diamond is placed in the place blue shaded region as in the picture. Now your task is to find the area of this region for Agent Hitman 47, as he needs to know where he should land to steal the diamond.</p> <p><b>Constraints:</b></p> <p><math>0 &lt; R_1, R_2, R_3 \leq 100</math></p> <p><b>Input Format:</b></p> <p>Each case starts with a line containing three real numbers denoting <math>R_1</math>, <math>R_2</math> and <math>R_3</math>. And no number contains more than two digits after the decimal point.</p>				

```
import java.util.*;

import java.lang.Math;

public class Class232241010042 {

    public static void main(String[] args) {

        double r1,r2,r3;

        double s,ae,a,b,c,e,x,y,z,s1;

        Scanner input=new Scanner(System.in);

        r1=input.nextDouble();

        r2=input.nextDouble();

        r3=input.nextDouble();

        a=r1+r2;

        b=r2+r3;

        c=r3+r1;

        x=Math.acos((b*b+c*c-a*a)/(2*b*c));

        y=Math.acos((a*a+c*c-b*b)/(2*c*a));

        z=Math.acos((a*a+b*b-c*c)/(2*a*b));

        s=(a+b+c)/2;

        s1=0.5*((y*r1*r1)+(z*r2*r2)+(x*r3*r3));

        ae=Math.sqrt(s*(s-a)*(s-b)*(s-c));

        e=ae-s1;

        String t =(String.format("%.4f",e));
```



```

        System.out.println(t);
    }
}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 11</div> </div>
Problem	<p>Question description</p> <p>Being a nonconformist, Shankar is displeased with the current state of things, particularly with the order of natural numbers (natural number is positive integer number). He is determined to rearrange them. But there are too many natural numbers, so Shankar decided to start with the first <math>n</math>. He writes down the following sequence of numbers: firstly all odd integers from 1 to <math>n</math> (in ascending order), then all even integers from 1 to <math>n</math> (also in ascending order). Help our hero to find out which number will stand at the position number <math>k</math>.</p> <p>Constraints:</p> $1 \leq k \leq n \leq 10^{12}$ <p>Input Format:</p> <p>The only line of input contains integers <math>n</math> and <math>k</math>.</p> <p>Output Format:</p> <p>Print the number that will stand at the position number <math>k</math> after Shankar's manipulations.</p>				

```

import java.io.*;

import java.util.Scanner;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner sc=new Scanner(System.in);

        long n,k;

        n=sc.nextInt();

        k=sc.nextInt();

        long odds = ( n + 1 ) / 2;

        System.out.println( k <= odds ? 2 * k - 1 : 2 * ( k - odds ) );

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 12</div> </div>
Problem	<p>Question description</p> <p>During the La Liga Match between Real Madrid and Barcelona, as a part of La Liga contest the question was asked to the fans.</p> <p>Who are all giving the correct answer to that question will get the free VIP box ticket for the Final for which Atletico Madrid have already qualified .</p> <p>The question is to take two numbers N and M as input and print the boolean value as "True" or "False" whether N is greater than or lesser than M and vice versa.</p> <p>Constraints</p> $1 \leq N \leq 100$ $1 \leq M \leq 100$ <p>Input Format:</p> <p>Single line input of two numbers N and M separated by a space</p> <p>Output Format:</p> <p>The corresponding boolean value as "True" or "False" after checking the condition</p>				

```

import java.io.*;

import java.util.*;

public class Class232241010096 {

    public static void main(String[] args) {

```

```

        Scanner r= new Scanner(System.in);

        int N=r.nextInt();

        int M=r.nextInt();

        System.out.println(N>=M);

        System.out.println(N<=M);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 13</div> </div>
<b>Problem</b>	<p>Question description</p> <p>Felix starts with an integer <math>n</math>.</p> <p>In one move, he can perform one of the following operations:</p> <ul style="list-style-type: none"> <li>divide <math>n</math> by one of its <b>proper</b> divisors, or</li> <li>subtract 1 from <math>n</math> if <math>n</math> is greater than 1.</li> </ul> <p>A proper divisor is a divisor of a number, excluding itself. For example, 1, 2, 4, 5, and 10 are proper divisors of 20, but 20 itself is not.</p> <p>What is the minimum number of moves Felix is required to make to reduce <math>n</math> to 1?</p> <p>Constraints:</p> <p><math>1 \leq n \leq 10^9</math></p> <p>Input Format:</p> <p>The only line of each test case contains a single integer <math>n</math>.</p> <p>Output Format:</p> <p>For each test case, output the minimum number of moves required to reduce <math>n</math> to 1.</p>				

```

import java.io.*;

import java.util.Scanner;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int n = input.nextInt();

        int m = Math.min(n&1,0);

        int s = (n%2==0)?(2):(3);

        System.out.println(s);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 14
Problem	<p>Question description</p> <p>Mr. Dana White is the manager of the Code cinemas and after a long break, the theatres are now open to the public again. To compensate for the loss in revenue due to Dark Plague, Mr. Dana White wants to maximize the profits for every show from now on and at the same time follow the guidelines set the by government. The guidelines are:</p> <ul style="list-style-type: none"> <li>If two people are seated in the same row, there must be at least one empty seat between them.</li> <li>If two people are seated in different rows, there must be at least one completely empty row between them. That is, if there are people seated in rows <math>i</math> and <math>j</math> where <math>i &lt; j</math>, there must be some row <math>k</math> such that <math>i &lt; k &lt; j</math> and nobody is seated in row <math>k</math>.</li> </ul> <p>Given the information about the number of rows and the number of seats in each row, find the maximum number of tickets Mr. Dana White can sell.</p> <p>Constraints:</p> <p><math>1 \leq N, M \leq 100</math></p> <p>Input Format:</p> <p>Single line of input containing two space-separated integers <math>N, M</math> — the number of rows and the number of seats in each row, respectively.</p> <p>Output Format:</p> <p>Output a single line containing one integer — the maximum number of tickets Mr. Dana White can sell.</p>				

```
import java.io.*;

import java.util.*;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        int a,b,c,d;

        a= in.nextInt();

        b= in.nextInt();

        Math.ceil(a/2);

        Math.ceil(b/2);

        c=a-a/2; //Math.ceil(a/2);

        d=b-b/2; //Math.ceil(b/2);

        System.out.println(c*d);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 15
Problem	<p>Question description</p> <p>Paul Rudd needs to make a rectangular box for his physics class project. He has bought <math>P</math> cm of wire and <math>S</math> cm<sup>2</sup> of special paper. He would like to use all the wire (for the 12 edges) and paper (for the 6 sides) to make the box.</p> <p>What is the largest volume of the box that Paul Rudd can make?</p> <p>Constraints:</p> <p><math>1 \leq P \leq 40000</math></p> <p><math>1 \leq S \leq 20000</math></p> <p>Input Format:</p> <p>Single line input contains two integers <math>P</math> and <math>S</math> in a line..</p> <p>Output Format:</p> <p>Print a real number that is the largest volume of the box that Paul Rudd can make, rounded to two decimal places.</p>				

```
import java.util.*;

public class Class232241010096 {
```

```

public static void main(String[] args) {

    Scanner sc = new Scanner(System.in);

    long a,b;

    a=sc.nextLong();

    b=sc.nextLong();

    double x=(double) (a-Math.sqrt(a*a-24*b))/12;

    double result = (x*x*x)-(a*x*x/4)+(b*x/2);

    System.out.println(String.format("%.2f",result));

}
}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 16
Problem	<p>Question description</p> <p>Mbappe and Pogba missed the last Euro football game, so they decided to watch the game's key moments on the Net. They want to start watching as soon as possible but the connection speed is too low. If they turn on the video right now, it will "hang up" as the size of data to watch per second will be more than the size of downloaded data per second.</p> <p>The guys want to watch the whole video without any pauses, so they have to wait some integer number of seconds for a part of the video to download. After this number of seconds passes, they can start watching. Waiting for the whole video to download isn't necessary as the video can download after the guys started to watch.</p> <p>Let's suppose that video's length is <math>c</math> seconds and Mbappe and Pogba wait <math>t</math> seconds before the watching. Then for any moment of time <math>t_0</math>, <math>t \leq t_0 \leq c + t</math>, the following condition must fulfill: the size of data received in <math>t_0</math> seconds is not less than the size of data needed to watch <math>t_0 - t</math> seconds of the video.</p> <p>Of course, the guys want to wait as little as possible, so your task is to find the minimum integer number of seconds to wait before turning the video on. The guys must watch the video without pauses.</p> <p>Constraints:</p> <p><math>1 \leq a, b, c \leq 1000</math></p> <p><math>a &gt; b</math></p> <p>Input Format:</p> <p>The first line contains three space-separated integers <math>a</math>, <math>b</math> and <math>c</math>. The first number (<math>a</math>) denotes the size of data needed to watch one second of the video. The second number (<math>b</math>) denotes the size of data Mbappe and Pogba can download from the Net per second. The third number (<math>c</math>) denotes the video's length in seconds.</p> <p>Output Format:</p> <p>Print a single number — the minimum integer number of seconds that Mbappe and Pogba must wait to watch football without pauses.</p>				

```

import java.util.Scanner;

public class Class232241010096 {

    public static void main(String[] args) {

        double a,b,c;

        Scanner sc=new Scanner(System.in);

        a=sc.nextDouble();

        b=sc.nextDouble();

        c=sc.nextDouble();

        System.out.println((int)Math.ceil(((int) (((a-b)*c+b-1)/b)));

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 17
	<p>Question description</p> <p>Once upon a time, there lived a mad programmer. He loved to solve creative problems other than anything. His wife loved him quite a lot but disliked his curiosity for the problems. One day he came from office, his wife gave him a glass of cold lime juice. She was in a romantic mood and waiting for some romantic stuff. But the programmer asked her curiously, "If I give u radius of the top and bottom part of the glass and the height, can you come up with the volume of the glass?" His wife became a bit disappointed but as she is smart she replied with a smile, "You already have drunk some juice, and the glass is not full. If I give you the height of the juice, can you find the volume of the remaining juice in the glass?" Then the programmer kissed his wife and said, "You are the best problem setter in the world!"</p> <p>Now he set the same problem for you. The radius of the upper part <math>r_1</math> and lower part <math>r_2</math> is given. If height of the glass is h and height of the juice is p what is the volume of the juice in the glass?</p>  <p>Constraints:</p> $1 \leq r_2 < r_1 \leq 100$ $1 \leq p \leq h \leq 100$ <p>Input Format:</p> <p>Each case starts with a line containing four integers <math>r_1</math>, <math>r_2</math>, h and p</p> <p>Output Format:</p> <p>For each case, print the case number and the volume of the juice in the glass, and the decimal value should be rounded off to 4 decimal places</p>				
Problem					

```
import java.io.*;

import java.util.*;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        double r1,r2,h,p,r,k,juice;

        r1=sc.nextDouble();

        r2=sc.nextDouble();

        h=sc.nextDouble();

        p=sc.nextDouble();

        r=p/(h*1.0)*(r1-r2)+r2;

        juice=(Math.PI/3.0)*p*(r*r+r2*r2+(r*r2));

        System.out.printf("%.4f%n",juice);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1Challenge 18
Problem	<p>Question description</p> <p>Some country is populated by wizards. They want to organize a demonstration.</p> <p>There are <math>n</math> people living in the city, <math>x</math> of them are the wizards who will surely go to the demonstration. Other city people (<math>n-x</math> people) do not support the wizards and aren't going to go to the demonstration. We know that the city administration will react only to the demonstration involving at least <math>y</math> percent of the city people. Having considered the matter, the wizards decided to create clone puppets which can substitute the city people on the demonstration.</p> <p>So all in all, the demonstration will involve only the wizards and their puppets. The city administration cannot tell the difference between a puppet and a person, so, as they calculate the percentage, the administration will consider the city to be consisting of only <math>n</math> people and not containing any clone puppets.</p> <p>Help the wizards and find the minimum number of clones to create to that the demonstration had no less than <math>y</math> percent of the city people.</p> <p>Constraints:</p> $1 \leq n, x, y \leq 10^4,$ $x \leq n$ <p>Input Format:</p> <p>The first line contains three space-separated integers, <math>n, x, y</math> - the number of citizens in the city, the number of wizards and the percentage the administration needs, correspondingly.</p> <p>Please note that <math>y</math> can exceed 100 percent, that is, the administration wants to see on a demonstration more people that actually live in the city (<math>&gt; n</math>).</p> <p>Output Format:</p> <p>Print a single integer — the answer to the problem, the minimum number of clones to create, so that the demonstration involved no less than <math>y</math> percent of <math>n</math> (the real total city population).</p>				

```
import java.io.*;

import java.util.*;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        int n,x,y;

        n=sc.nextInt();

        x=sc.nextInt();


        y=sc.nextInt();

        int m = Math.max((n*y+99)/100-x,0);

        System.out.println(m);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1Challenge 19
Problem	<p>Question description</p> <p>You all probably know how to calculate the distance between two points in two dimensional cartesian plane. But in this problem you have to find the minimum arc distance between two points and they are on a circle centered at another point.</p> <p>You will be given the co-ordinates of the points A and B and co-ordinate of the center O. You just have to calculate the minimum arc distance between A and B. In the picture, you have to calculate the length of arc ACB. You can assume that A and B will always be on the circle centered at O.</p>  <p>Constraints:</p> $1 \leq O_x, O_y \leq 10000$ $1 \leq A_x, A_y, B_x, B_y \leq 10000$ <p>Input Format:</p> <p>Each case starts with a line containing six integers <math>O_x, O_y, A_x, A_y, B_x, B_y</math> where <math>(O_x, O_y)</math> indicates the co-ordinate of O, <math>(A_x, A_y)</math> denote the co-ordinate of A and <math>(B_x, B_y)</math> denote the co-ordinate of B.</p> <p>Output Format:</p> <p>Print the case number and the minimum arc distance rounder off to 4 decimal places</p>				

```
import java.io.*;
```

```
import java.util.Scanner;

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        double r,ab,s,ox,oy,ax,ay,bx,by,alpha,result;

        ox=sc.nextDouble();

        oy=sc.nextDouble();

        ax=sc.nextDouble();

        ay=sc.nextDouble();

        bx=sc.nextDouble();

        by=sc.nextDouble();

        r=Math.sqrt(Math.pow((ox-ax),2)+Math.pow((oy-ay),2));

        ab=Math.sqrt(Math.pow((ax-bx),2)+Math.pow((ay-by),2));

        result=(r*r+r*r-ab*ab)/(2.0*r*r);

        alpha=Math.acos(result);

        s=r*alpha;

        System.out.println(String.format("%.4f",s));

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div><div>Level 1</div><div>Challenge 20</div></div>
Problem	<div>Question description</div> <div>Zach and Miller are preparing themselves for programming contests.</div> <div>An important part of preparing for a competition is sharing programming knowledge from the experienced members to those who are just beginning to deal with the contests. Therefore, during the next team training Zach decided to make teams so that newbies are solving problems together with experienced participants.</div> <div>Zach believes that the optimal team of three people should consist of one experienced participant and two newbies. Thus, each experienced participant can share the experience with a large number of people.</div> <div>However, Miller believes that the optimal team should have two experienced members plus one newbie. Thus, each newbie can gain more knowledge and experience.</div> <div>As a result, Zach and Miller have decided that all the teams during the training session should belong to one of the two types described above. Furthermore, they agree that the total number of teams should be as much as possible.</div> <div>There are <math>n</math> experienced members and <math>m</math> newbies on the training session. Can you calculate what maximum number of teams can be formed?</div> <div>Constraints:</div> <div><math>0 \leq n, m \leq 5 \cdot 10^5</math></div> <div>Input Format:</div> <div>The first line contains two integers <math>n</math> and <math>m</math> — the number of experienced participants and newbies that are present at the training session.</div> <div>Output Format:</div> <div>Print the maximum number of teams that can be formed.</div>				

```
import java.io.*;

import java.util.Scanner;
```

```

public class Class232241010096 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);

        int n,m;

        n = input.nextInt();

        m = input.nextInt();

        int ans = Math.min(Math.min(n,m),Math.min(m,(n+m)/3));

        System.out.println(ans);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 11
Problem	<p>Question description:</p> <p>Franklin has unlimited number of coins with values <math>1, 2, \dots, n</math>. He wants to select some set of coins having the total value of <math>S</math>.</p> <p>It is allowed to have multiple coins with the same value in the set. What is the minimum number of coins required to get sum <math>S</math>?</p> <p>Can you calculate that for him quickly?</p> <p>Constraints:</p> <p><math>1 \leq n \leq 100000</math></p> <p><math>1 \leq S \leq 10^9</math></p> <p>Input Format:</p> <p>The only line of the input contains two integers <math>n</math> and <math>S</math></p> <p>Output Format:</p> <p>Print exactly one integer - the minimum number of coins required to obtain sum <math>S</math>.</p>				

```

import java.io.*;

import java.util.*;

public class Class232241010020{

    public static void main(String[] args){

        Scanner sc= new Scanner(System.in);

        int n=sc.nextInt();

        int s=sc.nextInt();

        int k1,k2,t;

        k1=s/n;

        k2=s%n;

        t=(k2==0)?k1:k1+1;

        System.out.println(t);

    }

}

```



Course	JAVA	Session	Datatypes and Operators	Question Information	• Level 1 • Challenge 12
Problem	<p>Question description</p> <p>Paul Rudd needs to make a rectangular box for his physics class project. He has bought <math>P</math> cm of wire and <math>S</math> cm<sup>2</sup> of special paper. He would like to use all the wire (for the 12 edges) and paper (for the 6 sides) to make the box.</p> <p>What is the largest volume of the box that Paul Rudd can make?</p> <p>Constraints:</p> <p><math>1 \leq P \leq 40000</math></p> <p><math>1 \leq S \leq 20000</math></p> <p>Input Format:</p> <p>Single line input contains two integers <math>P</math> and <math>S</math> in a line..</p> <p>Output Format:</p> <p>Print a real number that is the largest volume of the box that Paul Rudd can make, rounded to two decimal places.</p>				

```
import java.util.*;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        long a,b;

        a=sc.nextLong();

        b=sc.nextLong();

        double x =(double) (a-Math.sqrt(a*a-24*b))/12;

        double result = (x*x*x)-(a*x*x/4)+(b*x/2);

        System.out.println(String.format("%.2f",result));

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	• Level 1 • Challenge 13
Problem	<p>Question description</p> <p>Mbappe and Pogba missed the last Euro football game, so they decided to watch the game's key moments on the Net. They want to start watching as soon as possible but the connection speed is too low. If they turn on the video right now, it will "hang up" as the size of data to watch per second will be more than the size of downloaded data per second.</p> <p>The guys want to watch the whole video without any pauses, so they have to wait some integer number of seconds for a part of the video to download. After this number of seconds passes, they can start watching. Waiting for the whole video to download isn't necessary as the video can download after the guys started to watch.</p> <p>Let's suppose that video's length is <math>c</math> seconds and Mbappe and Pogba wait <math>t</math> seconds before the watching. Then for any moment of time <math>t_0</math>, <math>t \leq t_0 \leq c + t</math>, the following condition must fulfill: the size of data received in <math>t_0</math> seconds is not less than the size of data needed to watch <math>t_0 - t</math> seconds of the video.</p> <p>Of course, the guys want to wait as little as possible, so your task is to find the minimum integer number of seconds to wait before turning the video on. The guys must watch the video without pauses.</p> <p>Constraints:</p> <p><math>1 \leq a, b, c \leq 1000</math></p> <p><math>a &gt; b</math></p> <p>Input Format:</p> <p>The first line contains three space-separated integers <math>a</math>, <math>b</math> and <math>c</math>. The first number <math>[a]</math> denotes the size of data needed to watch one second of the video. The second number <math>[b]</math> denotes the size of data Mbappe and Pogba can download from the Net per second. The third number <math>[c]</math> denotes the video's length in seconds.</p> <p>Output Format:</p> <p>Print a single number — the minimum integer number of seconds that Mbappe and Pogba must wait to watch football without pauses.</p>				

```
import java.util.Scanner;

public class Class232241010020 {

    public static void main(String[] args) {

        double a,b,c;
```

```

Scanner sc=new Scanner(System.in);

a=sc.nextDouble();

b=sc.nextDouble();

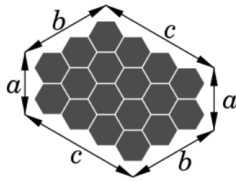
c=sc.nextDouble();

System.out.println((int)Math.ceil(((a-b)*c+b-1)/b));

}

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 14
Problem	<p>Question description</p> <p>Several ages ago Stratfordshire was a kingdom. The King of Stratfordshire adored math. That's why, when he first visited one of his many palaces, he first of all paid attention to the floor in one hall. The floor was tiled with hexagonal tiles.</p> <p>The hall also turned out hexagonal in its shape. The King walked along the perimeter of the hall and concluded that each of the six sides has <math>a</math>, <math>b</math>, <math>c</math>, <math>a</math>, <math>b</math> and <math>c</math> adjacent tiles, correspondingly.</p> <p>To better visualize the situation, look at the picture showing a similar hexagon for <math>a=2</math>, <math>b=3</math> and <math>c=4</math>.</p>  <p>According to the legend, as the King of Stratfordshire obtained the values <math>a</math>, <math>b</math> and <math>c</math>, he almost immediately calculated the total number of tiles on the hall floor. Can you do the same?</p> <p>Constraints:</p> <p><math>2 \leq a, b, c \leq 1000</math></p> <p>Input Format:</p> <p>The first line contains three integers: <math>a</math>, <math>b</math> and <math>c</math>.</p> <p>Output Format:</p> <p>Print a single number — the total number of tiles on the hall floor.</p>				

```

import java.util.*;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        int a,b,c;

        a= sc.nextInt();

        b=sc.nextInt();

        c=sc.nextInt();

        int ans =(a*b)+(b*c)+(c*a)-(a+b+c)+1;

        System.out.println(ans);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 15
Problem	<p>Question description</p> <p>Being a nonconformist, Shankar is displeased with the current state of things, particularly with the order of natural numbers (natural number is positive integer number). He is determined to rearrange them. But there are too many natural numbers, so Shankar decided to start with the first <math>n</math>. He writes down the following sequence of numbers: firstly all odd integers from 1 to <math>n</math> (in ascending order), then all even integers from 1 to <math>n</math> (also in ascending order). Help our hero to find out which number will stand at the position number <math>k</math>.</p> <p>Constraints:</p> $1 \leq k \leq n \leq 10^{12}$ <p>Input Format:</p> <p>The only line of input contains integers <math>n</math> and <math>k</math>.</p> <p>Output Format:</p> <p>Print the number that will stand at the position number <math>k</math> after Shankar's manipulations.</p>				

```
import java.util.*;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        long n,k;

        n=sc.nextInt();

        k=sc.nextInt();

        long ans =(k<=(n+1)/2)?(k*2-1):((k-(n+1)/2)*2);

        System.out.println(ans);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	Level 1 Challenge 16
Problem	<p>Question description</p> <p>Felix starts with an integer <math>n</math>.</p> <p>In one move, he can perform one of the following operations:</p> <ul style="list-style-type: none"> <li>divide <math>n</math> by one of its proper divisors, or</li> <li>subtract 1 from <math>n</math> if <math>n</math> is greater than 1.</li> </ul> <p>A proper divisor is a divisor of a number, excluding itself. For example, 1, 2, 4, 5, and 10 are proper divisors of 20, but 20 itself is not.</p> <p>What is the minimum number of moves Felix is required to make to reduce <math>n</math> to 1?</p> <p>Constraints:</p> $1 \leq n \leq 10^9$ <p>Input Format:</p> <p>The only line of each test case contains a single integer <math>n</math>.</p> <p>Output Format:</p> <p>For each test case, output the minimum number of moves required to reduce <math>n</math> to 1.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);
```

```

        int n = input.nextInt();

        int m = Math.min(n&1,0);

        int s = (n%2==0)?(2):(3);

        System.out.println(s);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 17</div> </div>
Problem	<p>Question description</p> <p>You've got a rectangular parallelepiped with integer edge lengths. You know the areas of its three faces that have a common vertex. Your task is to find the sum of lengths of all 12 edges of this parallelepiped.</p> <p>Constraints:</p> <p><math>1 \leq A, B, C \leq 10000</math></p> <p>Input Format:</p> <p>The first and the single line contains three space-separated integers <math>A, B</math> and <math>C</math> — the areas of the parallelepiped's faces</p> <p>Output Format:</p> <p>Print a single number — the sum of all edges of the parallelepiped.</p>				

```

import java.util.Scanner;

public class Class232241010020 {

    public static void main(String[] args) {

        int x,y,z;

        Scanner sc = new Scanner(System.in);

        x=sc.nextInt();

        y=sc.nextInt();

        z=sc.nextInt();

        double a=Math.sqrt(x*y/z) + Math.sqrt(z*x/y) + Math.sqrt(z*y/x);

        System.out.println(4* (int) a);

    }

}

```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div> <div>Level 1</div> <div>Challenge 18</div> </div>
Problem	<p>Question description</p> <p>Stormwind Basketball Cup starts really soon! Commentators from all over the world come to the event.</p> <p>Organizers have already built <math>n</math> commentary boxes. <math>m</math> regional delegations will come to the Cup. Every delegation should get the <i>same number</i> of the commentary boxes. If any box is left unoccupied then the delegations will be upset. <i>So each box should be occupied by exactly one delegation.</i></p> <p>If <math>n</math> is not divisible by <math>m</math>, it is impossible to distribute the boxes to the delegations at the moment.</p> <p>Organizers can build a new commentary box paying <math>a</math> dollars and demolish a commentary box paying <math>b</math> dollars. They can both build and demolish boxes arbitrary number of times (each time paying a corresponding fee). It is allowed to demolish all the existing boxes.</p> <p>What is the minimal amount of dollars organizers should pay to satisfy all the delegations (i.e. to make the number of the boxes be divisible by <math>m</math>)?</p> <p>Constraints:</p> <p><math>1 \leq n, m \leq 10^{12}</math></p> <p><math>1 \leq a, b \leq 100</math></p> <p>Input Format:</p> <p>The only line contains four integer numbers <math>n, m, a, b</math>, where <math>n</math> is the initial number of the commentary boxes, <math>m</math> is the number of delegations to come, <math>a</math> is the fee to build a box and <math>b</math> is the fee to demolish a box.</p> <p>Output Format:</p> <p>Output the minimal amount of dollars organizers should pay to satisfy all the delegations (i.e. to make the number of the boxes be divisible by <math>m</math>). It is allowed that the final number of the boxes is equal to 0.</p>				

```
import java.util.*;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner in=new Scanner(System.in);

        int n,m,a,b;

        int box=0;

        n=in.nextInt();

        m=in.nextInt();

        a=in.nextInt();

        b=in.nextInt();

        if(n%m==0){

            System.out.println(0);

        }

        box=Math.min(b*(n%m),(m-n%m)*a);

        System.out.println(box);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div><div></div> Level 1</div> <div><div></div> Challenge 19</div>
Problem	<p>Question description</p> <p>Carlos and his little brother Damian are been watching a movie in television , the advertisements in between are very long and boring so Carlos gave Damian a rectangle of length x and width y. Damian is required to determine a circle that contains the maximum circumference that fits inside the rectangle. This type of circle is called a big circle. Damian's task is to determine the maximum number of big circles that can fit inside the rectangle.</p> <p>Can you help him?</p> <p>Constraints:</p> <p><math>1 \leq x,y \leq 10^9</math></p> <p>Input format:</p> <p>First line of input contains two Integers x and y</p> <p>Output format:</p> <p>Print the answer on a new line denoting the maximum number of big circles that can fit in the provided rectangle.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        int x,y;

        x=in.nextInt();

        y=in.nextInt();

        int z = (x>y)?x/y:y/x;

        System.out.println(z);

    }

}
```

Course	JAVA	Session	Datatypes and Operators	Question Information	<div><div></div> Level 1</div> <div><div></div> Challenge 20</div>
Problem	<p>Question description:</p> <p>Kenneth is playing in a T20 cricket match. In a match, Team A plays for 20 overs. In a single over, the team gets to play 6 times, and in each of these 6 tries, they can score a maximum of 6 runs. After Team A's 20 overs are finished, Team B similarly plays for 20 overs and tries to get a higher total score than the first team. The team with the higher total score at the end wins the match.</p> <p>Kenneth is in Team B. Team A has already played their 20 overs, and have gotten a score of R. Kenneth's Team B has started playing, and have already scored C runs in the first O overs. In the remaining 20-O overs, find whether it is possible for Kenneth's Team B to get a score high enough to win the game. That is, can their final score be strictly larger than R?</p> <p>Constraints:</p> <ul style="list-style-type: none"><li><math>0 \leq C \leq R \leq 720</math></li><li><math>1 \leq O \leq 19</math></li><li><math>0 \leq C \leq 36 \cdot O</math></li></ul> <p>Input Format:</p> <p>There is a single line of input, with three integers, R,O,C</p> <p>Output Format:</p> <p>Output in a single line, the answer, which should be "YES" if it's possible for Kenneth's Team B to win the match and "NO" if not.</p>				

```
import java.io.*;

import java.util.Scanner;

public class Class232241010020 {

    public static void main(String[] args) {

        Scanner input = new Scanner(System.in);
```

```
int r,o,c;
r=input.nextInt();
o=input.nextInt();
c=input.nextInt();
String val=((20-o)*36>r-c)?"YES":"NO";
System.out.println(val);
}
}
```