**ANANYA LAHA**

**CSE**

**St Thomas’ College of Engineering and Technology**

**Assignment XFactor**

**1. This problem is know as Clock angle problem where we need to find angle between hands of an analog clock at a given time.**

**public Double findAngle(Integer hour, Integer minute)**

**Example 1**

Time : 12:45

Input : hour = 12, Minute = 45

Output : 112.5°

**Example 2**

Time : 3:30

Input : hour = 3, Minute = 30

Output : 75°

Source Code:

import java.util.Scanner;

class Clock

{

public static double findAngle(int hour, int minute)

{

if (hour <0 || minute < 0 || hour >12 || minute > 60)

System.out.println("Wrong input");

if (hour == 12)

hour = 0;

if (minute == 60)

{

minute = 0;

hour++;

if(hour>12)

hour = hour-12;

}

double hour\_angle = (0.5 \* (hour\*60 + minute));

double minute\_angle = (6\*minute);

double angle = Math.abs(hour\_angle - minute\_angle);

angle = Math.min(360-angle, angle);

return angle;

}

public static void main (String[] args)

{

Scanner obj = new Scanner(System.in);

int hour = obj.nextInt();

int minute = obj.nextInt();

System.out.print(findAngle(hour,minute));

}

}

**2.  Divide two integers without using division, multiplication and mod operator: division-without-division-operator**

Perform division without using division, multiplication and mod operator.

**private static Integer divide(Integer numerator, Integer denominator)**

Source Code:

import java.io.\*;

class New

{

private static int divide(int dividend, int divisor)

{

int sign = ((dividend < 0) ^ (divisor < 0)) ? -1 : 1;

dividend = Math.abs(dividend);

divisor = Math.abs(divisor);

int quotient = 0;

while (dividend >= divisor)

{

dividend -= divisor;

++quotient;

}

return sign \* quotient;

}

public static void main(String[] args) throws IOException

{

BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

int a = Integer.parseInt(br.readLine());

int b = Integer.parseInt(br.readLine());

System.out.println(divide(a, b));

}

}

**3. Design and implement a simple tax calculator application.**

Source Code:

import java.io.\*;

class Calculator

{

public static void main(String[] args) throws IOException

{

BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

double tax=0,it;

System.out.println("Enter income ");

it=Double.parseDouble(br.readLine());

if(it<=200000)

tax=0;

else if(it<=300000)

tax=0.1\*(it-200000);

else if(it<=500000)

tax=(0.2\*(it-300000))+(0.1\*100000);

else if(it<=1000000)

tax=(0.3\*(it-500000))+(0.2\*200000)+(0.1\*100000);

else

tax=(0.4\*(it-1000000))+(0.3\*500000)+(0.2\*200000)+(0.1\*100000);

System.out.println("Income tax amount is "+tax);

}

}