**1.Compare 2 integers**

Write a program to relate 2 integers entered by the user as equal to, less than or greater than.

**Input and Output Format:**

Input consists of 2 integers.

Refer sample input and output for formatting specifications.

All text in bold corresponds to input and the rest corresponds to output.

**Sample Input and Output 1:**

Enter the first number

**6**

Enter the second number

**8**

6 is less than 8

**Sample Input and Output 2:**

Enter the first number

**8**

Enter the second number

**6**

8 is greater than 6

**Sample Input and Output 3:**

Enter the first number

**8**

Enter the second number

**8**

8 is equal to 8

**2.Vowel or Consonant**

Write a program to determine whether the input character is a vowel or consonant.

**Input and Output Format:**

Input consists of a single character.

Output consists of a string --- “Vowel” / “Consonant” / “Not an alphabet”

Refer sample input and output for formatting specifications.

All text in bold corresponds to input and the rest corresponds to output.

**Sample Input and Output 1:**

Enter a character

**a**

Vowel

**Sample Input and Output 2:**

Enter a character

**Z**

Consonant

**Sample Input and Output 3:**

Enter a character

**#**

Not an alphabet

**3.GRADE**

Write a program to determine the grade of the student in a particular subject. Refer the table given below for grade details.

|  |  |
| --- | --- |
| Marks scored | Grade |
| 100 | S |
| [90,100) | A |
| [80,90) | B |
| [70,80) | C |
| [60,70) | D |
| [50,60) | E |
| <50 | F |
|  |  |

The interval [a,b) includes all numbers greater than or equal to a and less than b.

**Input and Output Format:**

Input consists of a single integer which corresponds to the marks scored by the student. Print Invalid Input if it is not in the range 0 to 100.

Refer sample input and output for formatting specifications.

All text in bold corresponds to input and the rest corresponds to output.

**Sample Input and Output 1:**

Enter the marks

**85**

The student obtained a B grade

**Sample Input and Output 2:**

Enter the marks

**850**

Invalid Input

**4. PROFIT OR LOSS**

A fruitseller buys a dozen mangoes at Rs.X. He sells 1 mango at Rs.Y. Write a program to determine the profit or loss in Rs. for the fruitseller.

**Input and Output Format:**

Input consists of 2 floating point numbers which correspond to X and Y.

Refer sample input and output for formatting specifications. All floating point numbers are displayed correct to 2 decimal places.

All text in bold corresponds to input and the rest corresponds to output.

**Sample Input and Output 1:**

Enter the price of a dozen mangoes

**60.0**

Enter the price at which 1 mango is being sold

**4**

Loss : Rs.12.00

**Sample Input and Output 2:**

Enter the price of a dozen mangoes

**60.0**

Enter the price at which 1 mango is being sold

**6**

Profit : Rs.12.00

**Sample Input and Output 3:**

Enter the price of a dozen mangoes

**60.0**

Enter the price at which 1 mango is being sold

**5**

No profit no loss

**5.FEE COLLECTION**

Write a program to determine the fee amount to be collected from a student. The input to the program are the type of the student, tuition fee, bus fee, hostel fee.

Refer the table below for fee details.

|  |  |  |
| --- | --- | --- |
| Student Type | Student Type denoted as | Fee Details |
| Merit Seat Day Scholar | MSDS­ | Tuition fee + Bus fee |
| Merit Seat Hosteller | MSH | Tuition fee + Hostel fee |
| Management Seat Day Scholar | MGSDS | 150% of Tuition fee + Bus fee |
| Management Seat Hosteller | MGSH | 150% of Tuition fee + Hostel fee |

**Input and Output Format:**

Input consists of a string (student type), tuition fee(float), bus fee(float) and hostel fee(float). All floating point numbers are displayed correct to 2 decimal places.

Refer sample input and output for formatting specifications.

All text in bold corresponds to input and the rest corresponds to output.

**Sample Input and Output :­**

Enter the student type

**MSH**

Enter tuition fee

**40000**

Enter bus fee

**12000**

Enter hostel fee

**50000**

The fees to be paid by the student is Rs.90000

**6.Y2K Problem Detector**

Write a program that asks a user for their birth year encoded as two digits (like "62") and for the current year, also encoded as two digits (like "99"). The program is to correctly write out the users age in years.

**Input Format:**

Input consists of 2 integers. The first integer corresponds to the last 2 digits of the birth year. The second integer corresponds to the last 2 digits of the current year.

**Output Format:**

Refer sample input and output for further formatting specifications.

**Sample Input and Output:**

[All text in bold corresponds to input and the rest corresponds to output]  
 Enter Year of Birth

62

Enter Current year

99

Your age is 37

 The program will have to determine when a two digit value such as "62" corresponds to a year in the 20th century ("1962") or the 21st century. Here is another run of the program, where "00" is taken to mean the year 2000:

 Enter Year of Birth

62

Enter Current year

00

Your age is 38

 Assume that ages are not negative. Another run of the program:

 Enter Year of Birthr

27

Enter Current year

07

Your age is 80

 In the following run, the age of the person could be 6 or 106 depending on the assumptions. Assume that the age will always be less than or equal to 100.

 Enter Year of Birth

01

Enter Current year

07

Your age is 6

 Enter Year of Birth

**62**

Enter Current year

**99**

Your age is 37

**7.Lab Allocation I**

There are 3 labs in the CSE department(L1, L2 and L3) with a seating capacity of x, y and z. Find the lab which has the minimal seating capacity.

**Input and Output Format:**

Assume that x, y and z are always distinct.

Refer sample input and output.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output 1:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

L3 has the minimal seating capacity

**8.Lab Allocation II**

There are 3 labs in the CSE department(L1, L2 and L3) with a seating capacity of x, y and z. One of the 3 labs has been allocated for ACE training. Out of the available labs, find the lab which has the minimal seating capacity.

**Input and Output Format:**

Assume that x, y and z are always distinct.

Refer sample input and output.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output 1:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

Enter the lab allocated for ACE training

**L3**

L1 has the minimal seating capacity

**9.Lab Allocation III**

There are 3 labs in the CSE department(L1, L2 and L3) with a seating capacity of x, y and z. A single lab needs to be allocated to a class of 'n' students. How many of the 3 labs

can accommodate 'n' students?

**Input and Output Format:**

Refer sample input and output.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output 1:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

Enter n

**25**

2 lab(s) can accommodate 25 students

**Sample Input and Output 2:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

Enter n

**50**

None of the labs can accommodate 50 students

**10.Lab Allocation IV**

There are 3 labs in the CSE department(L1, L2 and L3) with a seating capacity of x, y and z. A single lab needs to be allocated to a class of 'n' students. The labs need to be utilized to the maximum i.e the number of systems that are not being used should be minimal. Which lab needs to be allocated to this class?

**Input and Output Format:**

Assume that x, y and z are always distinct.

Refer sample input and output.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

Enter n

**25**

L1 should be allocated to this class

**Sample Input and Output 2:**

Enter x

**30**

Enter y

**40**

Enter z

**20**

Enter n

**50**

None of the labs can be allocated

**11.Seat Allocation I**

The seats are arranged in the lab in a rectangular fashion with m rows and n columns. The students are seated in the lab according to their roll numbers in rowwise order.

Given the roll number of a student, find whether the student is seated in the first row or in the 1st or last column.

**Input and Output Format:**

Refer sample input and output.

The output consists of a string --- “yes” or “no”.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output 1:**

Enter the number of rows

**5**

Enter the number of columns

**10**

Enter the roll number of the student

**41**

yes

**Sample Input and Output 2:**

Enter the number of rows

**5**

Enter the number of columns

**10**

Enter the roll number of the student

**42**

No

**12.Seat Allocation II**

The seats are arranged in the lab in a rectangular fashion with m rows and n columns. The students are seated in the lab according to their roll numbers in column-wise order.

Given the roll number of a student, find whether the student is seated in the 1st row or in the 1st or last column.

**Input and Output Format:**

Refer sample input and output.

The output consists of a string --- “yes” or “no”.

**All text in bold corresponds to input and the rest corresponds to output.**

**Sample Input and Output 1:**

Enter the number of rows

**5**

Enter the number of columns

**10**

Enter the roll number of the student

**41**

yes

**Sample Input and Output 2:**

Enter the number of rows

**5**

Enter the number of columns

**10**

Enter the roll number of the student

**42**

no

**13.HOTEL TARIFF CALCULATOR**

 Write a C program to calculate the hotel tariff. The room rent is 20% high during peak seasons [April-June, November-December]

**Input Format:**

The first line of the input contains an integer which corresponds to the number of the month. [ January is 1, Feb is 2 and so on].  The second line of the input consists of a floating point number which corresponds to the room rent per day. The third line of the input consists of an integer which corresponds to the number of days stayed in the hotel.

**Output Format:**

Output consists of a single line which displays the hotel tariff to be payed.  Hotel tariff should be displayed correct to 2 decimal places. Refer  sample output  for format details.

**Sample Input 1:**

3

1500

2

**Sample Output 1:**

Hotel Tariff: Rs.3000.00

**Sample Input 2:**

4

2000

2

**Sample Output 2:**

Hotel Tariff: Rs.4800.00

**Sample Input 3:**

14

**Sample Output 3:**

Invalid Input

**14.P2 - Green Lights**

We are driving down the street and see a green traffic light ahead. Because we know precisely the pattern of this traffic light, we know exactly how long we have before it will turn red. We wish to compute whether we will pass the traffic light before it turns red at our current speed.

Write a program that takes the following floating point numbers as input:

* our current speed in miles per hour (s)
* the distance to the light in miles (d)
* the time until it turns red in seconds (t)

and displays a message indicating whether we will beat the light. You may assume that the input won't be such that we reach the light at exactly the same time it turns red.

**Input Format:**

Input consists of 3 lines.

* The first line of the input consists of a floating point number which corresponds to the speed,s.
* The second line of the input consists of a floating point number which corresponds to the distance,d.
* The third line of the input consists of a floating point number which corresponds to the time, t.

**Output Format:**

Output consists of a string ("yes" or "no").  Output yes if we will be able to beat the light at current speed. Output no if we won't be able to beat light at current speed.

**Sample Input 1:**

59.99

1.0

60.0

**Sample Output 1:**

no

**Sample Input 2:**

60.01

1

60

**Sample Output 2:**

yes

**15.BUDGET**

**Description:**It’s your job to calculate the cost of replacing damaged battle droids and to check whether it is within the budget limit of Rs. 15000. The cost of the equipment and parts is given in the table below.

|  |  |
| --- | --- |
| Blast Rifle | Rs. 350.34 |
| Visual Sensors | Rs. 230.90 |
| Auditory Sensors | Rs. 190.55 |
| Arms | Rs. 125.30 |
| Legs | Rs. 180.90 |

Can you write a program to do the given task?

**Input:**

The input consists of 5 positive integers separated by a space (A B C D E).

A: number of blast rifles needed

B: number of visual sensors needed

C: number of auditory sensors needed

D: number of arms needed

E: number of legs needed

**Output:**

Output consists of a single string (“yes” or “no”). Print yes if the total cost of replacing damaged battle droids is within the sanctioned budget of Rs. 15000. Print no otherwise.

**Sample Input:**

20 10 14 3 9

**Sample Output:**

yes

16.P1 - **SECE DINING**

The catering staff in the SECE mess are known for their good cooking skills as well as hospitality. We all know that the dining table arrangement needs to be different for left handed and right handed persons.

So whenever any VIP guests come to SECE, they would make the table arrangements based on whether they are left handed or right handed.

The mess is situated in the 15th floor of the hostel building. SECE hostel building has superfast elevators to help to travel from one floor to another. Each elevator has 2 doors, the front one and the rear one. If a person enters the elevator through the front door, he goes out through the rear door and vice-versa. The elevator has 2 rails numbered as 1 and 2. Rail 1 is located to the left of the entrance to the front door (or correspondingly, to the right of the entrance to the rear door). Rail 2 is located opposite it, to the right of the entrance to the front door and to the left of the entrance to the rear door. We know that each person holds at the rail with his/her strongest hand.

There is an IP camera in the elevator and based on the camera output, the catering staff will be easily able to identify whether a guest is left handed or right handed.

They have decided to automate this task and they asked the help of Image Processing Group. The Image Processing Group has written a program to perform this task and the program will output the door through which the person entered and the rail number which the person held.

Based on this input, can you write a program to determine whether a person is left handed or right handed?

**Input Format:**

The first line of the input is a string. The input may be “front” or “rear”.

The second line of the input is an integer. The input may be 1 or 2.

**Output Format:**

Output consists of the string “Left Handed” or “Right Handed”.

**Sample Input:**

front

1

**Sample Output:**

Left Handed

**17.Circle Intersection**

In this problem you must write a program that determines if two circles intersect each other. The input to your program will be the <x, y> coordinates for the center of each circle, followed by the radius(r) of each circle. The output will state whether the circles overlap, do not overlap, or are tangential (i.e., tangential circles touch each other at just one common point).

**Input Format:**

Input consists of 6 integers. The first integer corresponds to the x-coordinate of the centre of the first circle. The second integer ccorresponds to the y-coordinate of the centre of the first circle. The third integer corresponds to the radius of the first circle. The next 3 integers correspond to the x,y and radius of the second circle.

**Output Format:**

The output consists of a single line which contains any of these 3 strings --- “The circles are tangential”, “The circles overlap”, “The circles do not overlap”

**Sample Input 1:**

10

10

3

10

6

1

**Sample Output 1:**

The circles are tangential

**Sample Input 2:**

8

8

3

8

4

2

**Sample Output 2:**

The circles overlap

**18.P5 - Time Sheet**

Jeevitha just started work as a programming trainer for UIT's Placement Cell. She is paid Rs.100 an hour, with a few exceptions. She earns an extra Rs.15 an hour for any part of a day where she works more than 8 hours, and an extra Rs.25 an hour for hours beyond 40 in any one week. Also, she earns a 25% bonus for working on Saturday, and a 50% bonus for working on Sunday. The bonuses for Saturday and Sunday are computed based on the hours worked those days; they are not used to calculate any bonus for working more than 40 hours in a week.

You'll be given the number of hours Jeevitha worked each day in a week (Sunday, Monday, ..., Saturday), and you need to compute her salary for the week.

**Input Format:**

Input consists of 7 positive integers, less than or equal to 24 on separate lines.

**Output Format:**

Output consists of a single integer  ---  Jeevith's salary for the week.

**Sample Input 1:**

0

8

8

8

10

6

0

**Sample Output 1:**

4030

**Sample Input 2:**

4

0

0

0

0

6

0

**Sample Output 2:**

1200

**19.Microwave Oven**

A microwave oven manufacturer recommends that when heating two items, add 50% to the heating time, and when heating three items double the heating time. Heating more than three items at once is not recommended.

Write a program that asks the user for the number of items and the single-item heating time. The program then writes out the recommended heating time.

**Input Format:**

The first input is an integer which corresponds to the number of items. The second integer is a float which corresponds to the single item heating time.

**Output Format:**

Refer sample input and output for further formatting specifications.

**Sample Input and Output 1:**

[All text in bold corresponds to input and the rest corresponds to output]

Enter the number of items

**2**

Enter the single item heating time

**5.0**

The recommended heating time is 7.50

**Sample Input and Output 2:**

[All text in bold corresponds to input and the rest corresponds to output]

Enter the number of items

**4**

Enter the single item heating time

**5.0**

Number of items is more

**Matinee Movie Tickets**

 Write a program that determines the price of a movie ticket. The program asks for the customer's age and for the time on a 24-hour clock (where noon is 12.00 and 4:30PM is 16.30). The show timings are 10.15, 13.30, 18.00 and 22.00. The normal adult ticket price is $8.00, however the adult matinee price is $5.00. Adults are those over 13 years. The normal children's ticket price is $4.00, however the children's matinee price is $2.00.

**Input Format:**

The first input is an integer which corresponds to the age. The second integer is a float which corresponds to the show timing.

**Output Format:**

Refer sample input and output for further formatting specifications.

**Sample Input and Output:**

**[All text in bold corresponds to input and the rest corresponds to output]**

Enter your age

**16**

Enter show timing

**10.15**

The ticket price is $8.00