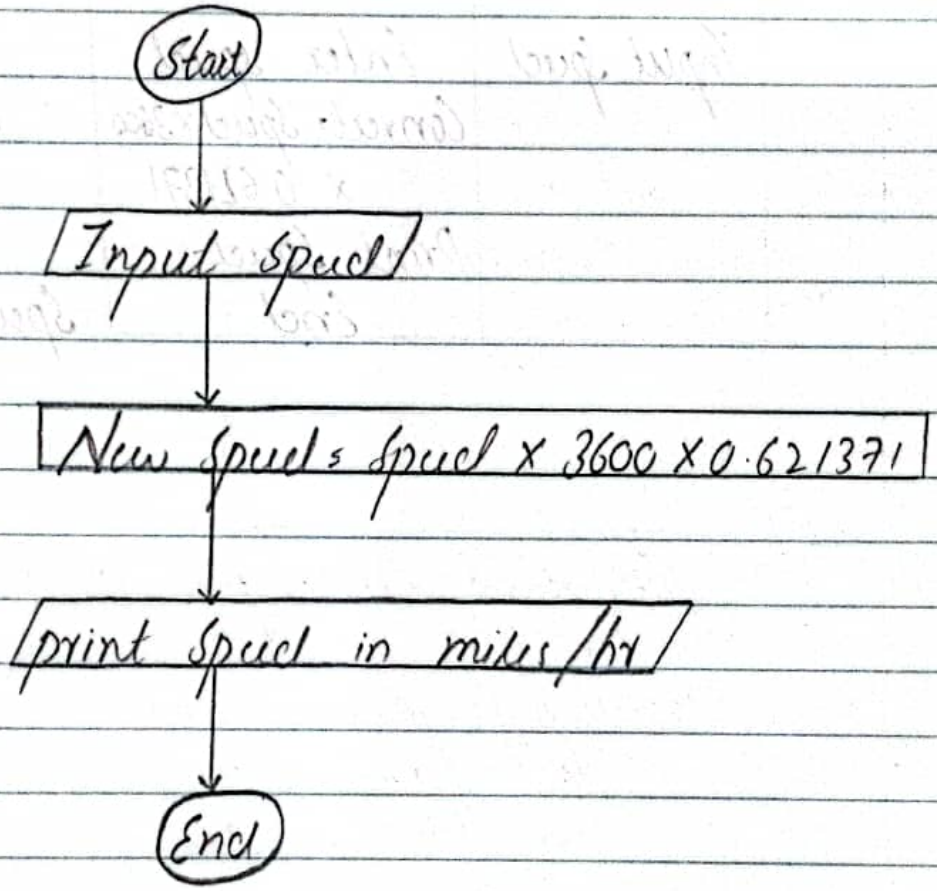
# ⇒ Programming fundamentals (Assignment)

Date:

Name:- Yash-Raj
Roll-number :- 24K-0737

## Task #1:-

### flowchart:-




### Pseudocode:-

1- start
2- prompt user to enter speed.
3- Convert Speed (entered) into miles/hr by multiplying speed with 3600 x 0.621371.
4- Display Speed in miles/hr.
5- End.

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Name:- Yash Raj  Roll no:- 24k-0737

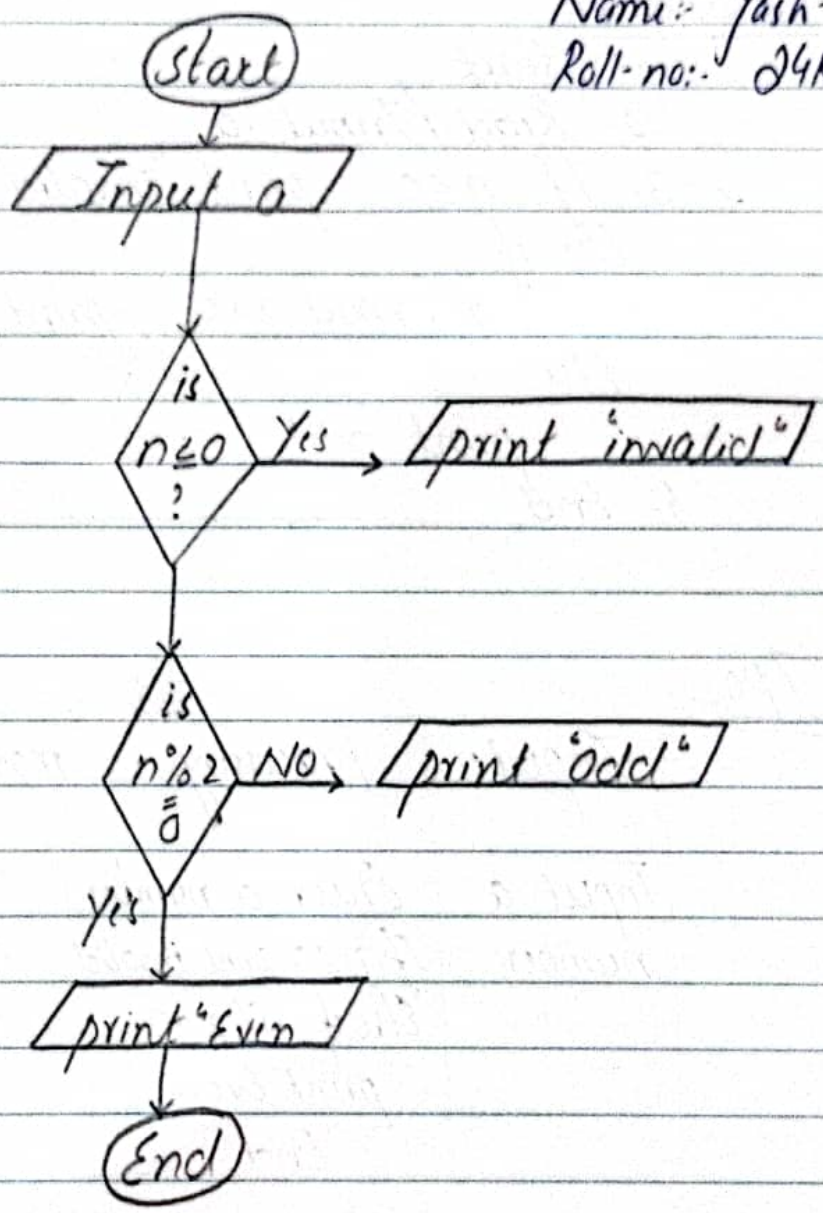
## IPO:-

| Input:- | processing:- | Module-Reference | Output |
|---|---|---|---|
| Input speed | Enter speed<br>Convert speed × 3600 × 0.621371<br>Print Speed<br>End | Read<br>Calculate<br><br>print<br>Speed Conversion | Speed in miles/hr |

Task #2:-

flowchart:-

Name:- Yash Raj
Roll-no:- 24K-0737



Name:- Yash Raj  Roll-no:- 24K-0737

## Pseudocode:-

1- Start
2- Read / Input a
3- If $n \leq 0$ print "invalid"
Else if
n mod 2 = 0 print "Even"
Else
print "odd"
4- End.

## IPO:-

| Input:- | Processing | module-Reference | Output:- |
|---|---|---|---|
| Input a number | Enter a number<br>If $n \leq 0$ print invalid<br>Else if $n \% 2 = 0$<br>print Even<br>End | Read<br>Read<br>Calculate<br>print | print invalid<br>print Even |

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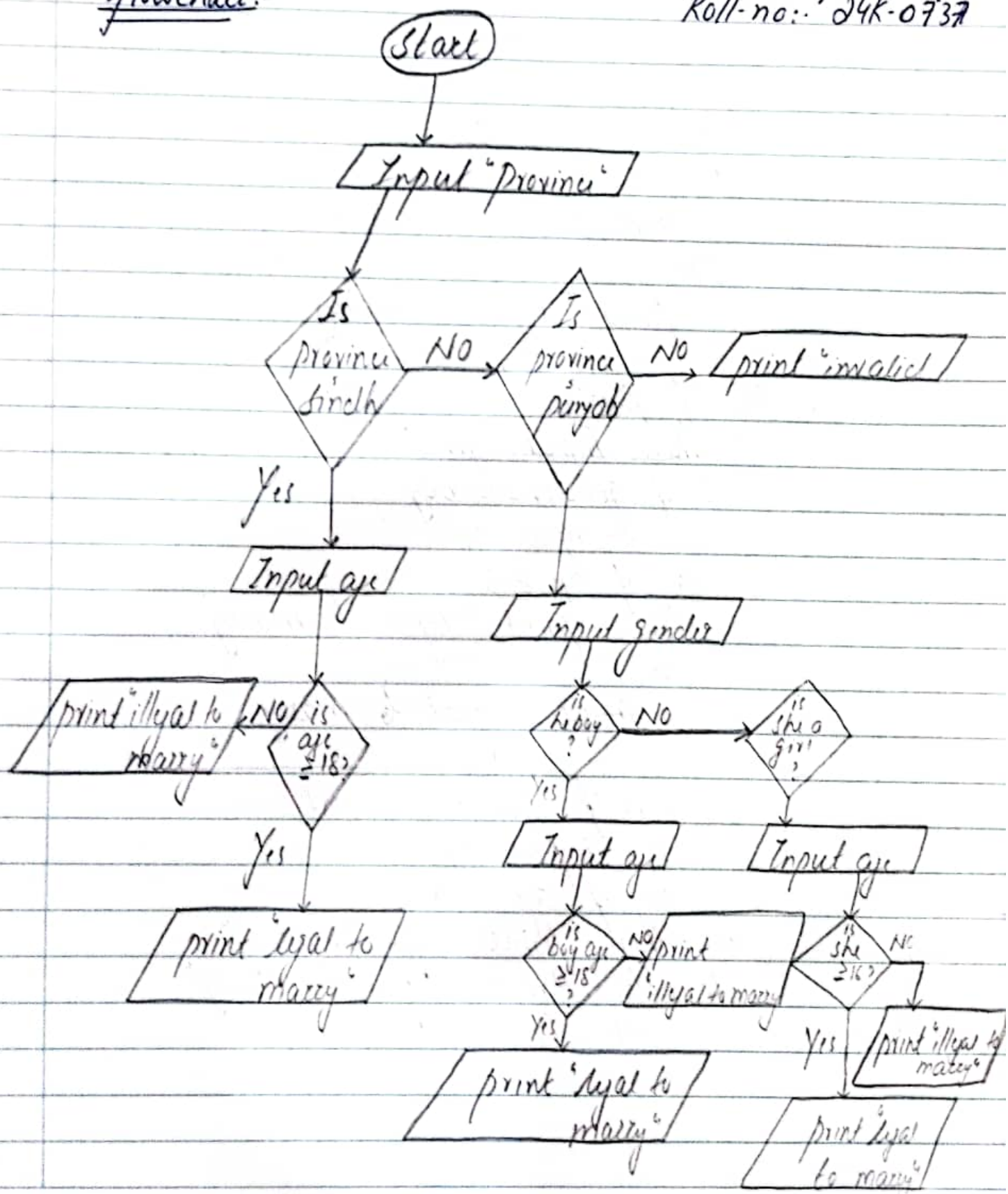
Task #3:-

Flowchart:-

Name:- Yash Raj
Roll-no:- 24K-0737



Name:- Yash-Raj  Roll-no:- 24K-0737

Pseudocode:-

1- Start
2- Input province
3- if province == Sindh
4- then input age
5- if age ≥ 18
then print "legal to marry"
Else
print "illegal to marry"

6- Else if province == punjab
7- then Input gender
8- if gender == boy
9- input age
10- if age ≥ 18
then print "legal to marry"
Else
11- print "illegal to marry"

12- Else if gender == girl
13- input age
14- if age ≥ 16
15- then print "legal to marry"
16- Else Print "illegal to marry"
17- End

Name:- Yash-Raj Roll-no:- 24k-0737

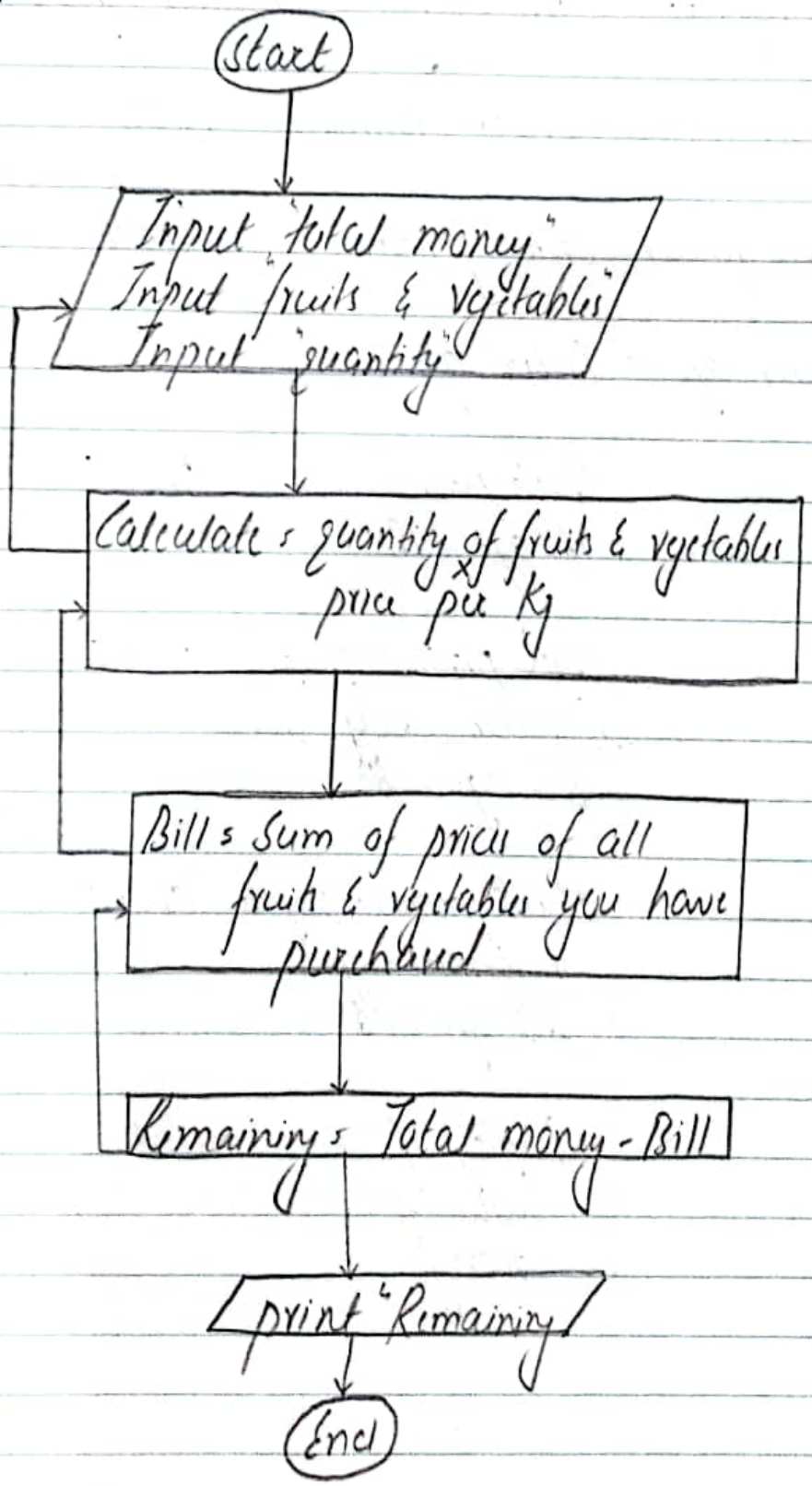
IPO:-

| Input:- | processing:- | Module-Refrence:- | Output:- |
|---|---|---|---|
| ~~Enter~~ province | Enter province | Read | |
| ~~Enter~~ gender | Enter gender | Read | |
| ~~Enter~~ age | Enter age | | |
| | Check province == Sindh if age ≥ 18 | Check | "legal to marry" "illegal to marry" |
| | check province == punjab if gender == boy && age ≥ 18 | check | |
| | check province == punjab if gender == girl && age ≥ 16 | check | |
| | Display if 'legal to marry' | print | |

Task #4:-

Name:- Yash Raj
Roll-no:- 24K-0737

flowchart:-



Name:- Yash-Raj Roll-no:- 24K-0737 Date:

## Pseudocode:-

1- Start
2- Input total money.
3- Input vegetables and fruits.
4- Calculate: "Vegetables & fruits quantity" x "price/kg".
5- Bill: Sum of all prices of all vegetbales & fruits you have purchased.
6- Remaining: Total-Bill
7- Print "Remaining"
8- End.

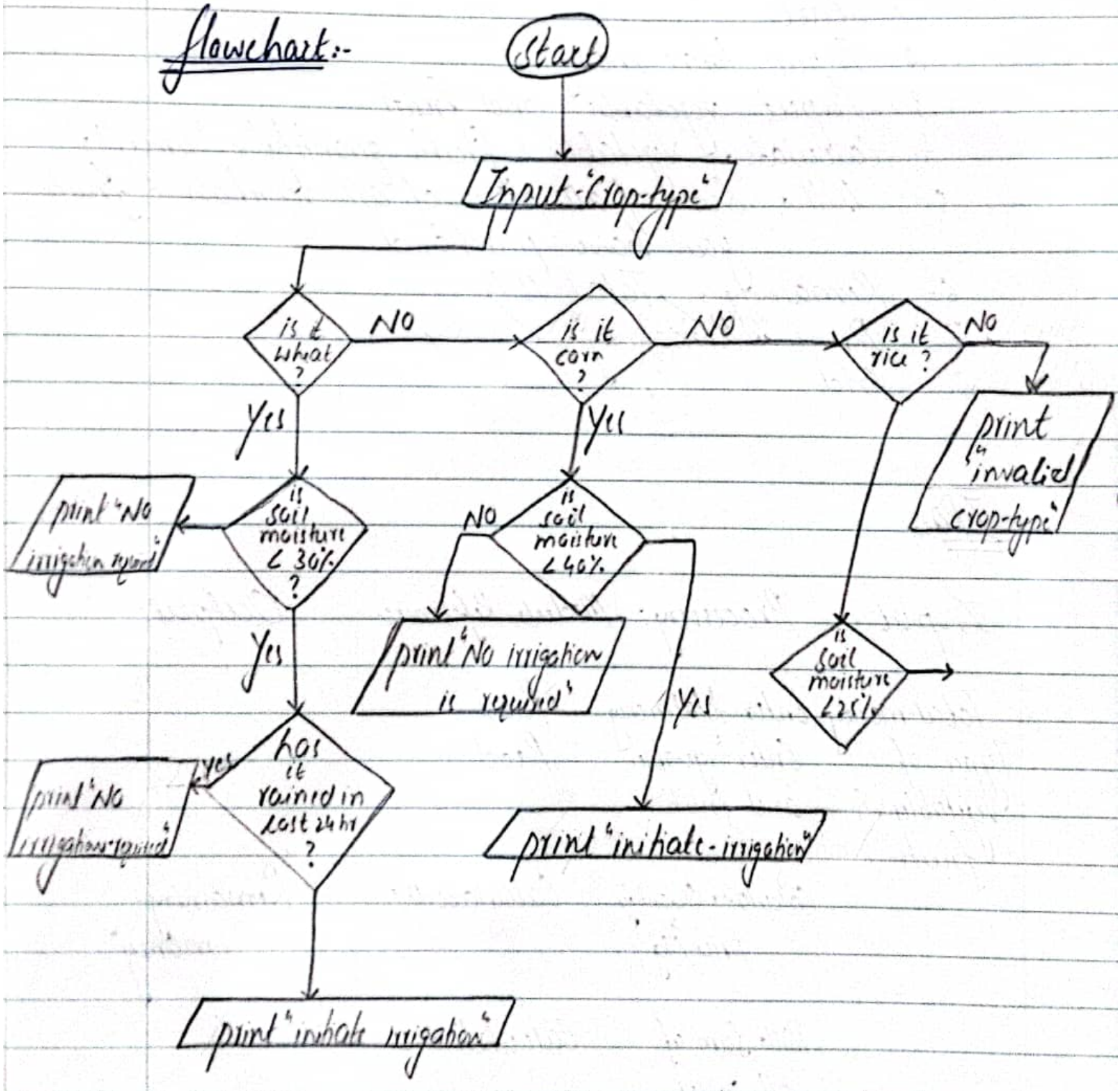
## IPO:-

| Input:- | Processing:- | Module-Referance:- | Output:- |
|---|---|---|---|
| Total-money<br>Types of Vegetables & fruits. | Enter total-money<br>Enter "vegetables and fruits" | Read<br>Read | |
| | Calculate: Quantity x price/kg | Calculate #1 | "Remaining-money". |
| | Bill: Sum of all prices | Calculate #2 | |
| | Remaining: Total-Bill<br>Print remaining | Calculate #3<br>Print | |

Name:- Yash-Raj  Roll-no:- 24K-0737

## Problem #5:-

## flowchart:-



Name:- Yash Raj  Roll-no:- 24K-0737

Pseudocode:-

1- Start
2- Input "crop type".
3- If it is wheat crop
   Soil moisture < 30% && not rained in last 24hr.
   print "Initiate irrigation".

4- Else if it is corn crop
   soil moisture < 40%.
   print "initiate irrigation".

5- Else if it is a rice crop
   Soil moisture < 25% && rained in last 24 hrs.
   print "initiate irrigation".

6- Else "print no irrigation"

7- End.

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Name:- Yash Raj  Roll-no:- 24k-0737

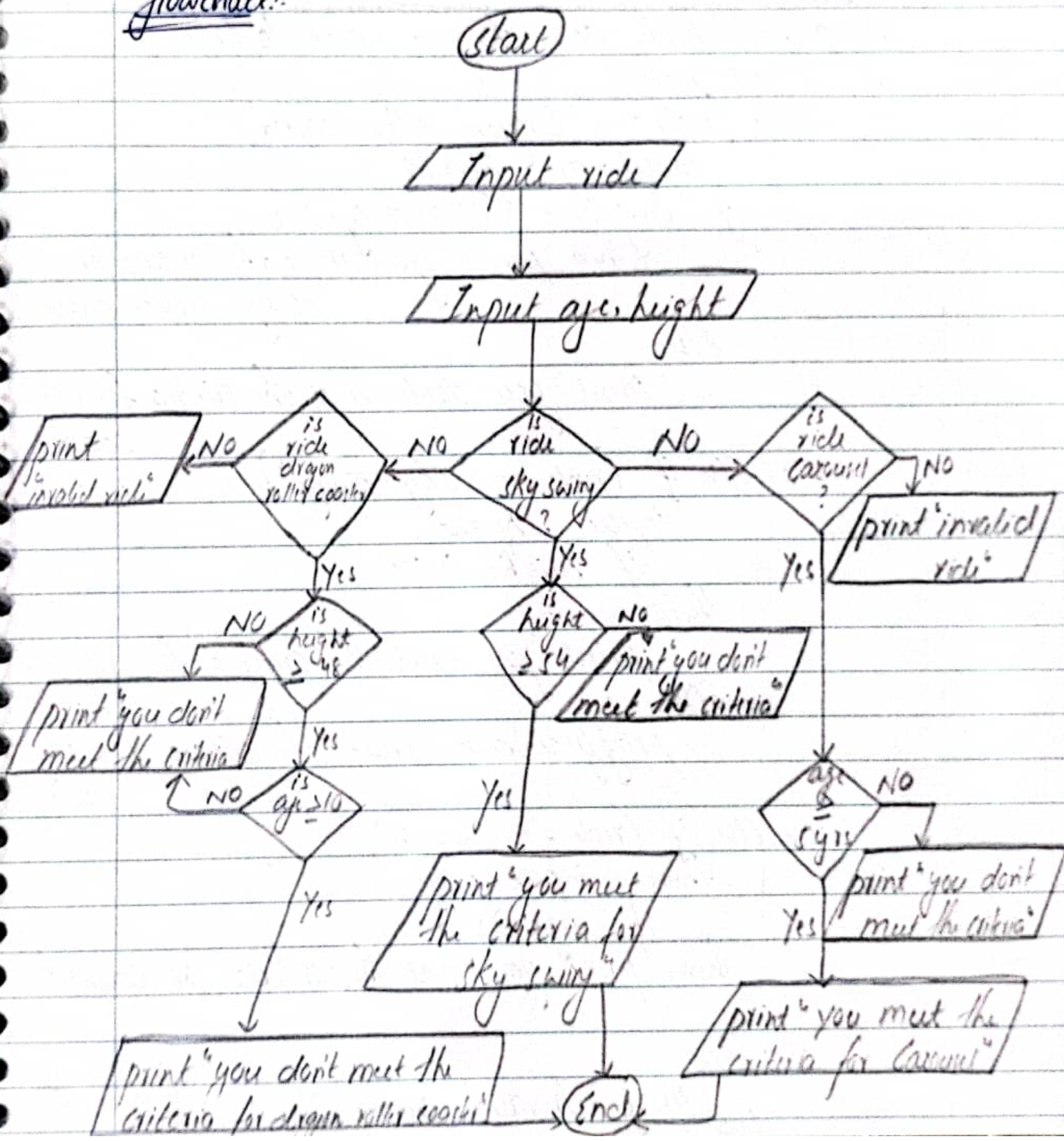
IPO:-

| Input:- | Processing:- | Module Reference | Output:- |
|---|---|---|---|
| "Crop-type" | Enter "crop-type" (Wheat, corn, rice) | Read | |
| "Soil moisture levels" | Enter "soil-moisture & rainfall status based on input" | Read | |
| "Rainfall status of 24 hours" | | | "Initiate-irrigation" |
| | Check for wheat if soil moisture < 30% & not rained in last 24 hours. | Check | "No irrigation is required" |
| | Check for corn if soil moisture < 40%. | check | |
| | Check for rice if soil moisture < 25% & rained in last 24 hrs | check | |
| | Display if crop requires irrigation. | print. | |

Problem #6:-

Name:- Yash Raj
Roll-no:- 24k-0737

flowchart:-



Name:- Yash Raj  Roll-no:- 24K-0737

## Pseudocode:-

1- Start
2- print "Which ride do you want to take:"
3- Input ride
4- If (ride == "Dragon roller coaster")
    input age, height
    if height ≥ 48 and age ≥ 10
        then print "you met the criteria for dragon roller coaster."
    Else
        print "you don't met the criteria for roller coaster."
5- Else if (ride == "Sky swing")
    input height
    if height ≥ 54
    then
        print "you met the criteria for Sky swing"
    Else
        print "you don't met the criteria for sky swing".
6- Else if (ride == Carousel)
    then input age
    If age ≥ 5 yrs
    then print "you met the criteria for Carousel"

7- Else
    print "Invalid ride"
End

Name:- Yash Raj  Roll-no:- 24K-0737  Date:

IPO:-

| Input:- | Processing:- | Module-Returns:- | Output:- |
|---|---|---|---|
| Input ride | Enter "ride" | Read | |
| Input hight | Enter "hight" | Read | |
| Input age | Enter "age" | Read | |
| | Check for dragon roller coaster if hight ≥ 48 inches && age ≥ 10 | check | "you meet the criteria" "Sorry, you don't meet the criteria". |
| | Check for sky swing If hight ≥ 54 inches | check | |
| | Check for Carousel if age ≥ 5yrs | check | |
| | Display if meets the criteria | print | |

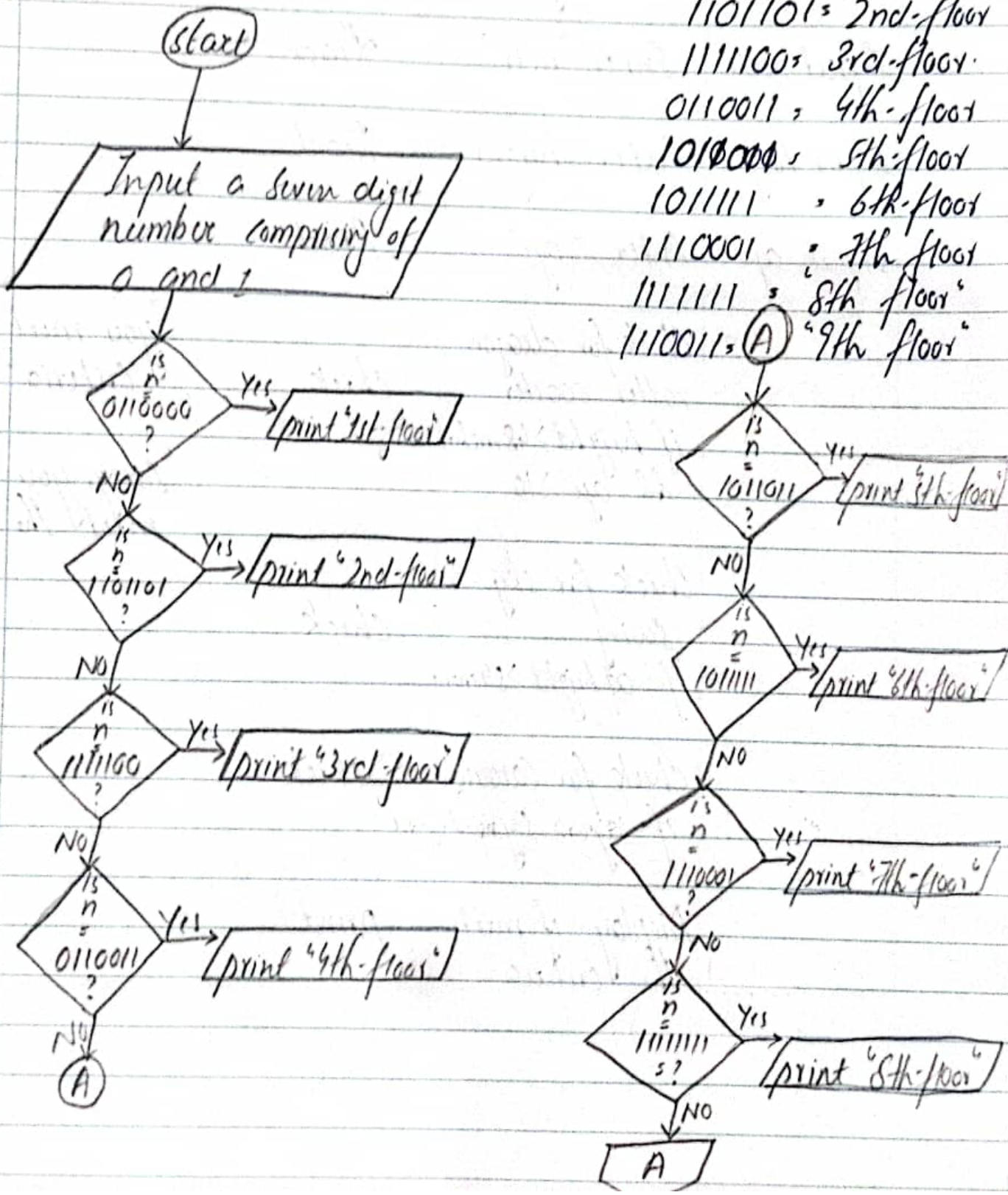
Name:- Yash Raj  Roll-no:- 24K-0737

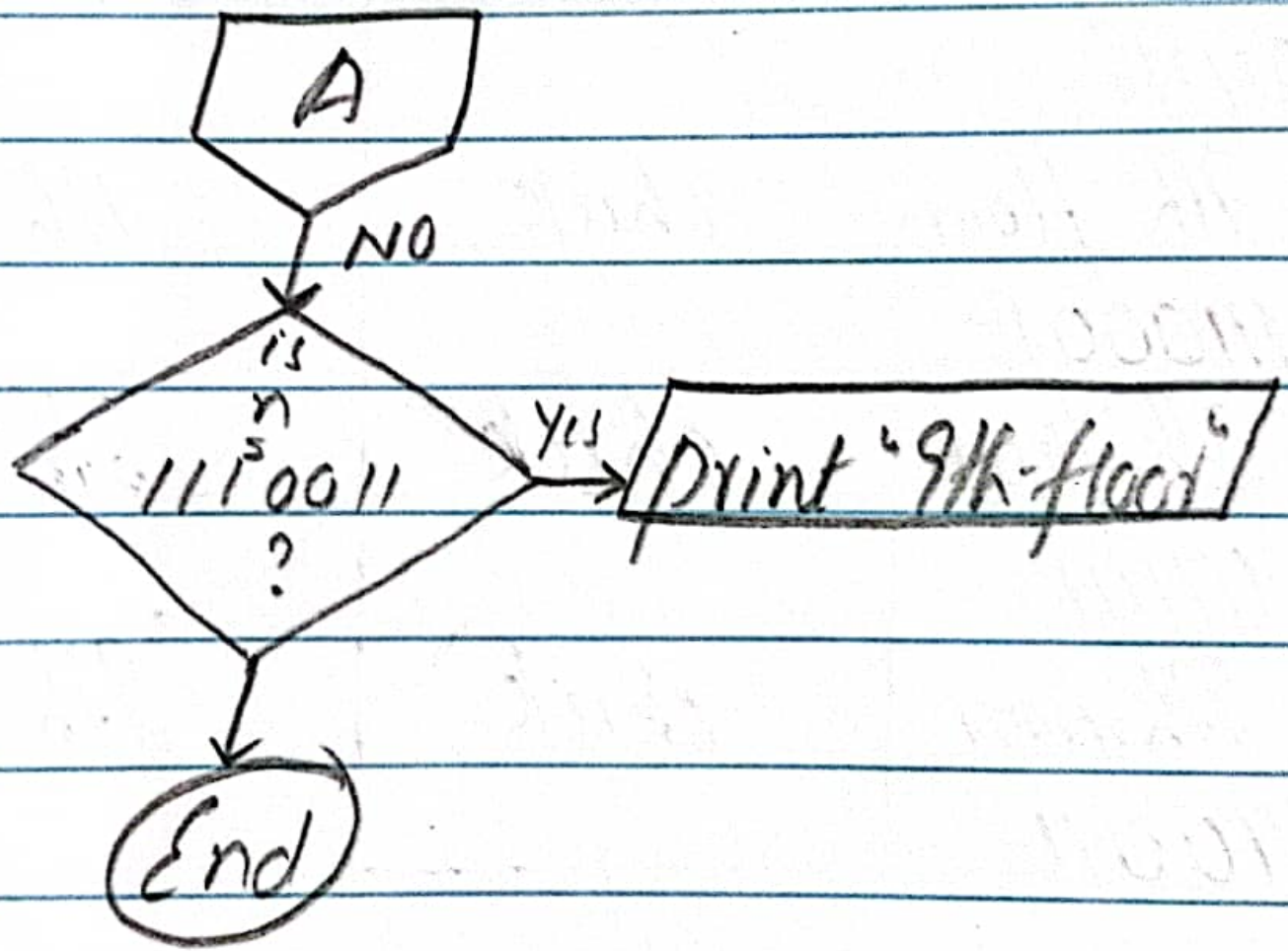
## Problem#7:-

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1111110 = 0
0110000 = 1st-floor
1101101 = 2nd-floor
1111100 = 3rd-floor
0110011 = 4th-floor
1011011 = 5th-floor
1011111 = 6th-floor
1110001 = 7th floor
1111111 = "8th floor"
1110011 = (A) "9th floor"

## flowchart:-



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Name:- Yash-Raj  Roll no:- 24K-0737  Date:

Pseudocode:-

1- Start
2- Input "Seven number digit Binary number".
3- If n=1111110 then print "0"
   n=0110000 then print "1st floor"
   Else if n= 1101101 print "2nd floor"
   Else if n= 1111100 print "3rd floor".
   Else if n= 0110011 print "4th floor"
   Else if n= 1011011 print "5th floor"
   Else if n= 1011111 print "6th floor"
   Else if n= 1110001 print "7th floor".
   Else if n= 1111111 print "8th floor"
   ~~4- Else print "invalid input".~~
   Else if n= 1110011 print "9th floor"

   Else print "invalid input".

Name: Yash Raj  Roll-no:- 24k-0737

IPO:

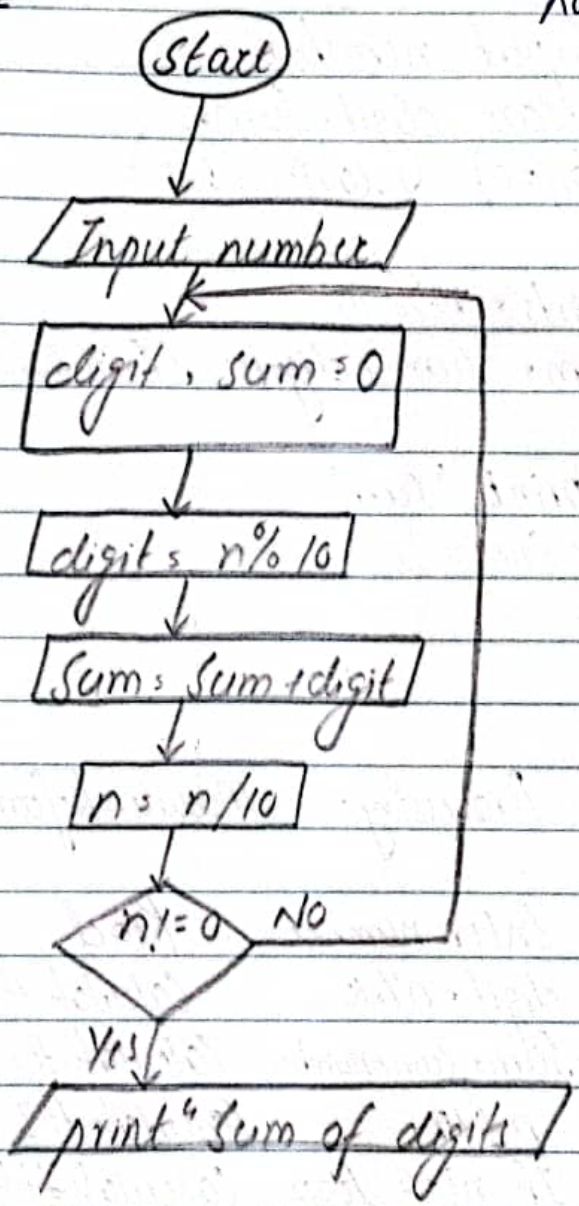
| Input:- | Processing:- | Module Reference:- | Output:- |
|---|---|---|---|
| Input "Seven digit number" | Enter number<br>check for 1st floor<br>If n=0110000 | Read | "1st floor" |
| | Check for 2nd floor<br>If n= 1101101 | check | "2nd floor" |
| | check for 3rd floor<br>If n= 1111100 | check | "3rd floor" |
| | check for 4th floor<br>If n= 0110011 | check | "4th-floor" |
| | check for 5th floor<br>If n= 1011011 | check | "5th floor" |
| | check for 6th floor<br>If n= 1011111 | check | "6th-floor" |
| | check for 7th floor<br>If n= 1110001 | check | "7th-floor" |
| | Check for 8th floor<br>If n= 1111111 | check | "8th floor" |
| | check for 9th floor<br>If n= 1110011 | check | "9th floor" |
| | Display the floor | print | |

Date:

Problem #8

Name:- Yash-Raj
Roll-no:- 24K-0737.

flowchart:-



Name:- Yash Raj  Roll-no:- 24K-0737  Date:

## Pseudocode:-

1- Start
2- Input number
3- Declare digit, Sum=0
if (n!=0) loop (While)

digits = n% 10
Sum = sum + digits (End While)
Else
print 'sum'.
End.

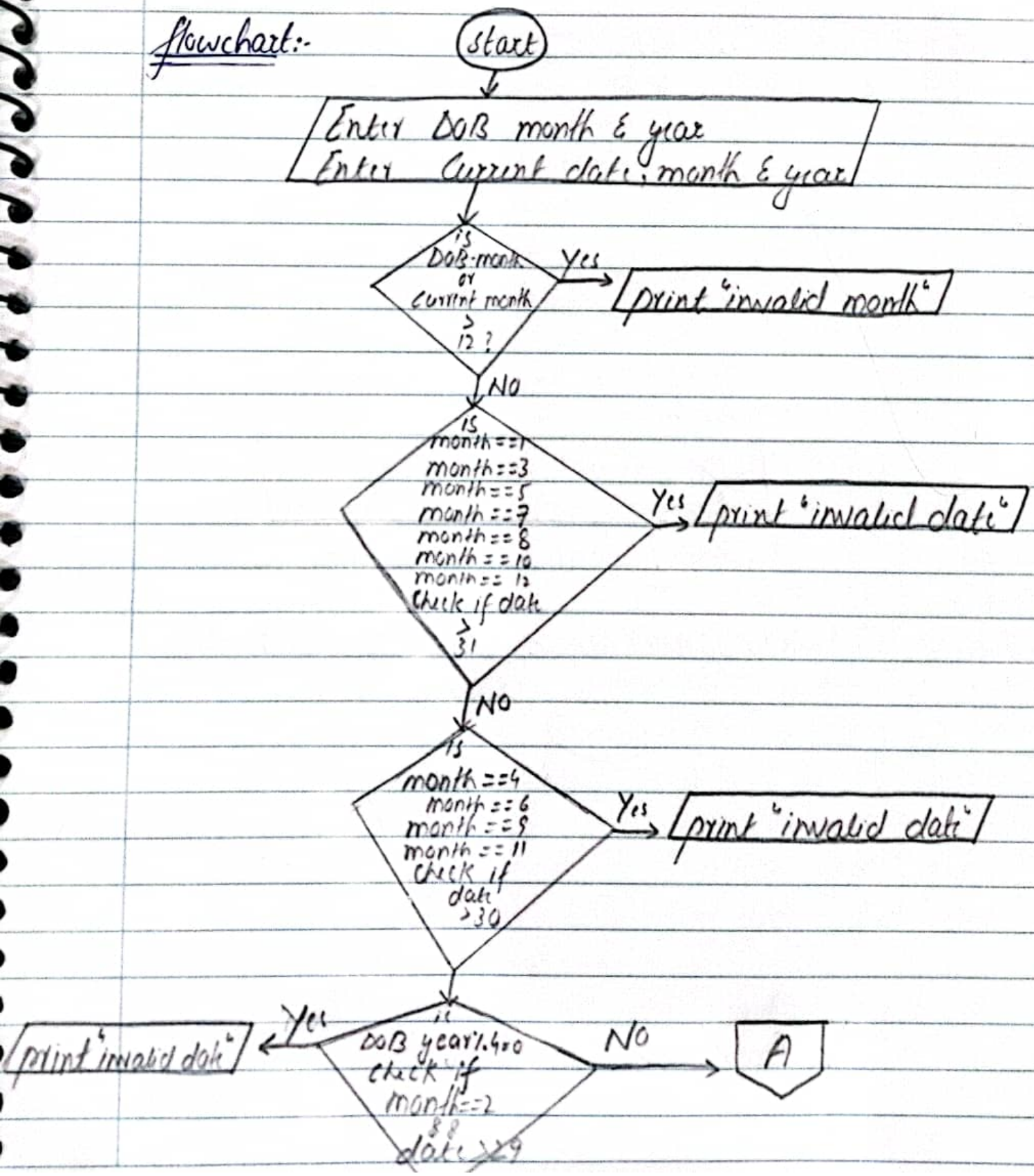
## IPO:-

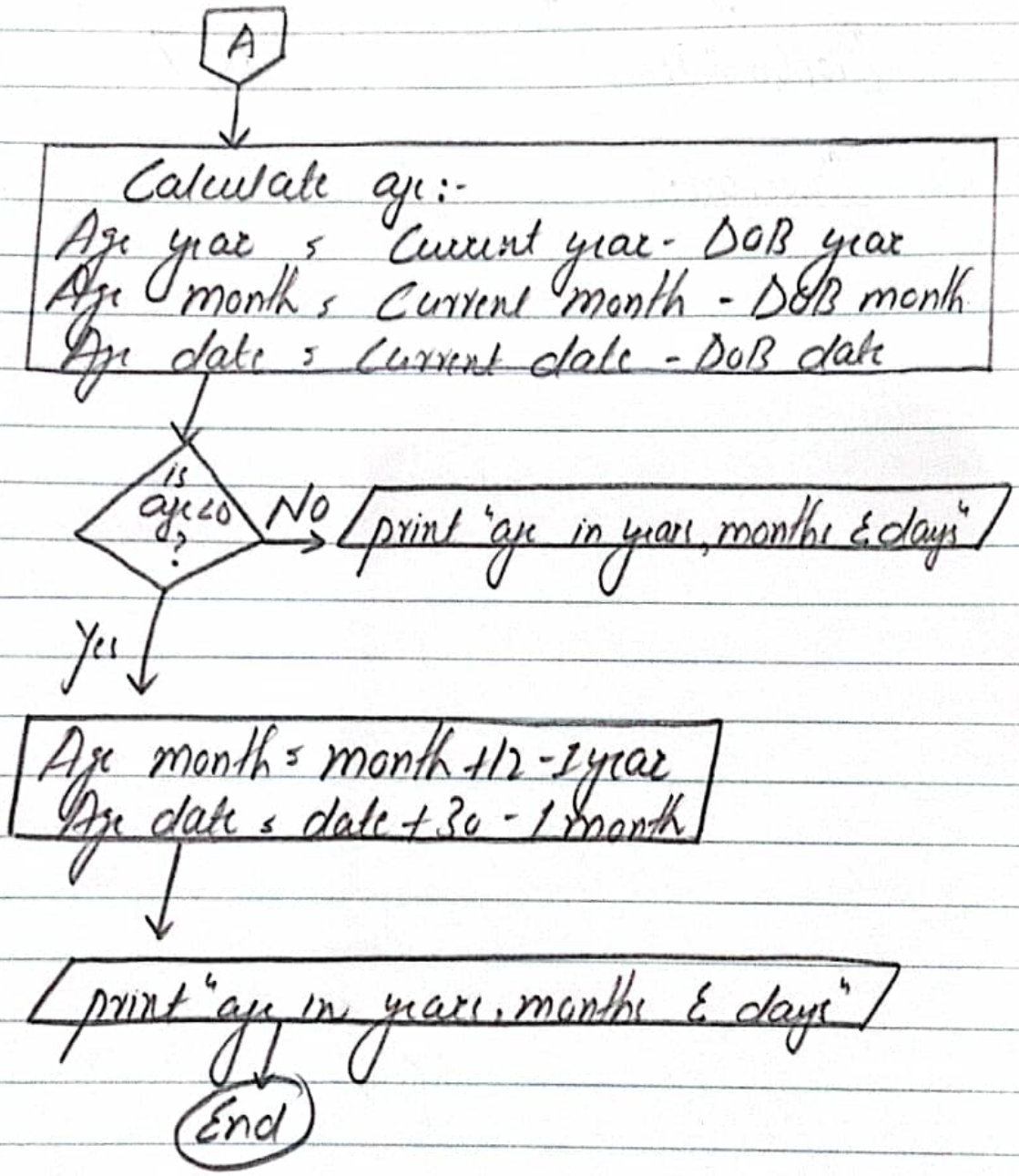
| Input:- | Processing:- | Module Reference:- | Output:- |
|---|---|---|---|
| Input number | Enter number<br>digit = n%10<br>Sum = sum+number<br>n/10<br>If n!=0 loop | Read<br>Calculate #1<br>Calculate #2<br>Calculate #3<br>Calculate #4 | Sum. |

Name:- Yash-Raj Roll-no:- 24k-0737 Date:

## Problem#9:-

### flowchart:-




A
Calculate age:-
Age year = Current year - DOB year
Age month = Current month - DOB month
Age date = Current date - DOB date
is age<0 ?
No
print "age in years, months & days"
Yes
Age month = month + 12 - 1 year
Age date = date + 30 - 1 month
print "age in years, months & days"
End

Pseudocode:-

1- Start
2- Input date, month & year of your birth
3- Input Current date, month & year

4- If (DOB month >12 || current month >12)
then print "invalid month."
5- Else if (month==1 month==3 month==5
month==7 month==8 month==10
month==12 && date >31)
then print "invalid date"

6- Else if (month==4 month==6 month==9
month==11 && date >30)
then print "invalid date"

7- Else if (DOB year % 4 = 0 && (month==2 && date>29))
then print "invalid date".

8- Else
Calculate age:- Age year = current year - DOB year
Age month = Current month - DOB month
Age date = Current date - DOB date
9- If (age >0)
then print "age in years, month & days"
Else Age month = month +12 - 1 year.
Age date = date +30 - 1 month.
then print "age in years, days & months".

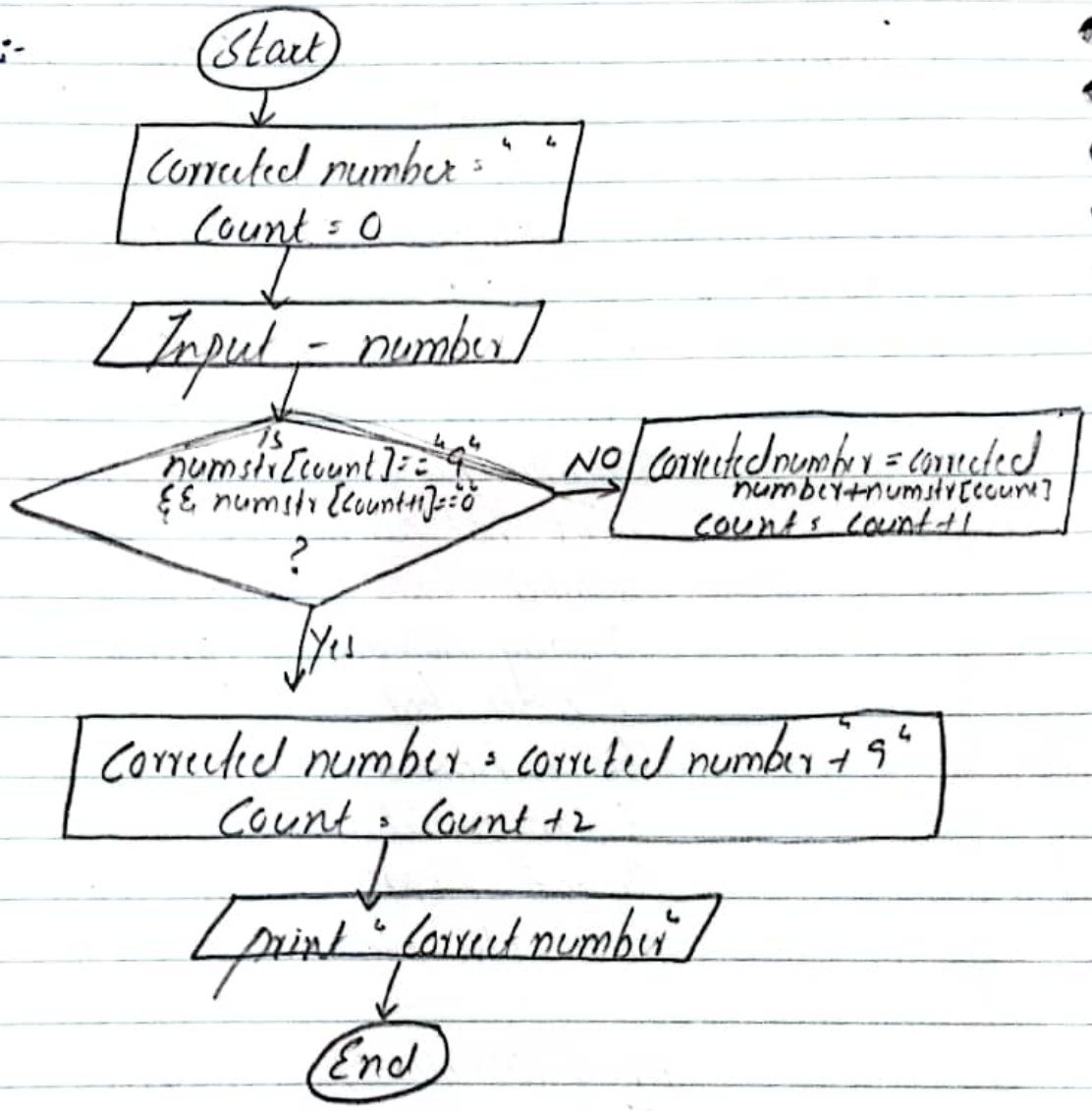
Name:- Yash Raj  Roll-no:- 24K-0737

## IPO:-

| Input:- | Processing:- | Modules-Reference: | Output:- |
|---|---|---|---|
| Input DOB month, date & year | Enter DOB year month & date. | Read | |
| Input Current month date & year. | Enter Current year month & date | Read | |
| | Check If (DOB month>12 \|\| Current month>12) | Check | "invalid month" |
| | Check if (month==1 month==10 month==3 month==5 month==7 month==12 && date>31) | Check | "invalid date" |
| | Check if (month==4 month==6 month==9 month==11 && date>30) | Check | "invalid date" |
| | Check if (DOB%4=0)&& (month==2 && date>29) | Check | "invalid date" |
| | → Calculate age:- | | |
| | Age year = Current-DOB year | Calculate #1 | |
| | Age month = Current-DOB month | Calculate #2 | |
| | Age date = Current-DOB-date | Calculate #3 | |
| | Check If (age<0) | | "age in years, months & days". |
| | Age month = month+12-1year | | |
| | Age date = date+30-1month | | |
| | Display | Print | |

Name:- Yash Raj  Rollno:- 24k-0737

Problem #10:-



Name:- Yash Raj  Roll-no:- 24k-0737  Date:

Pseudocode:-

1- Start
2- //Initialization  Corrected number = " ", count = 0
3- Input /Enter number.
4- If (numstr[count] == "9" && numstr[count+1] == "0")
   then
      Corrected number = corrected number + "9"
         Count = Count+2
      print "Correct number"
5- Else
      Corrected number = corrected number + numstr[count]
         count = count+1
End.

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Name:- Yash Raj  Roll-no:- 24k-0737

=> IPO:-

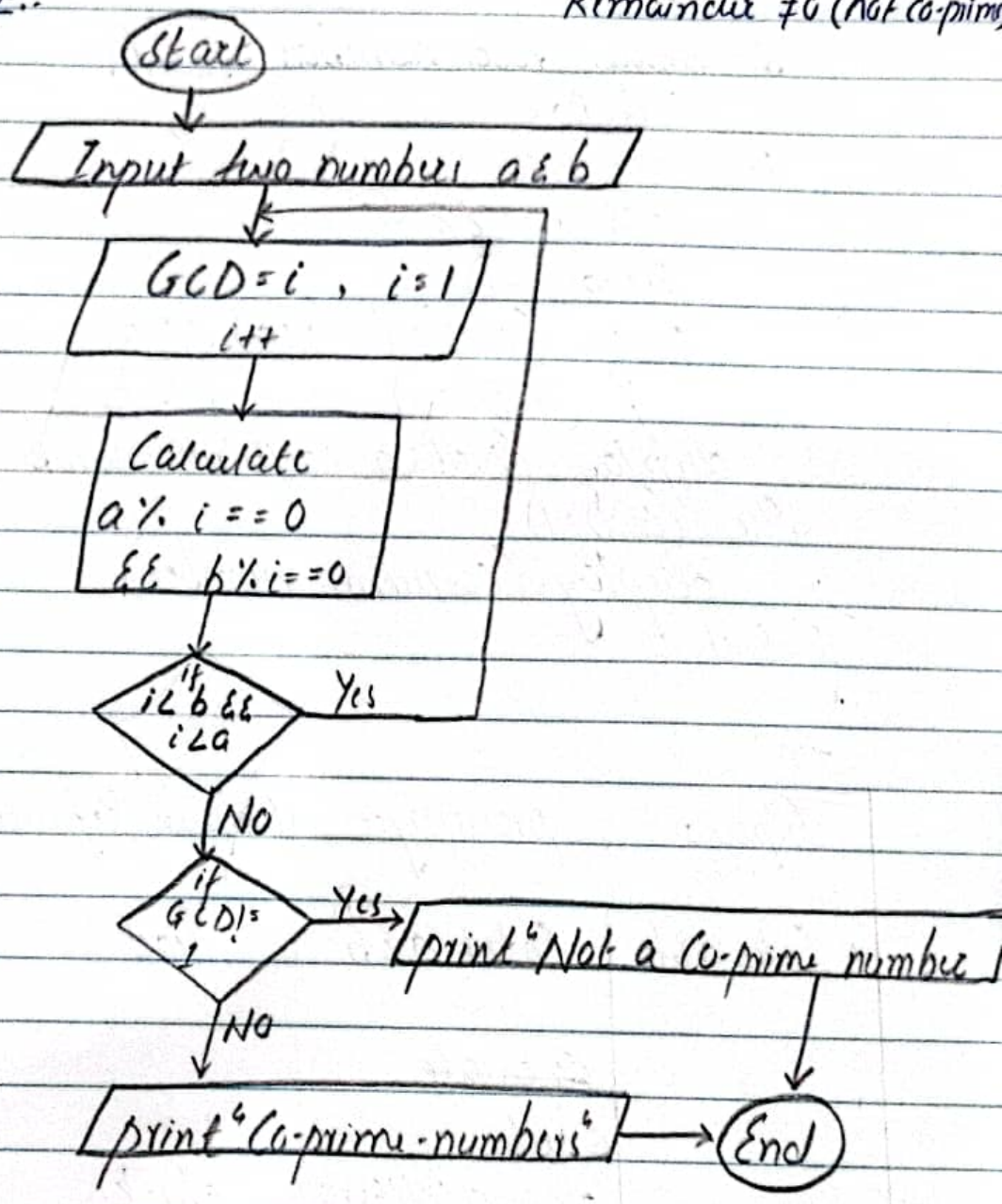
| Input:- | Processing:- | Module - Returns | Output:- |
|---|---|---|---|
| numstring<br>Input number | ~~Enter a number~~ | Read | |
| | Initialize variable corrected number of string data type with empty space character. | | |
| | | | print the number |
| | Initialize variable count of integer datatype to "0" | | |
| | Enter the number | | |
| | While count < length | | |
| | If numstr[count] == "9" && numstr[count] == "0" | Check | |
| | | Calculate | |
| | corrected number = corrected number + "9" | | |
| | count = count + 2 | Calculate | |
| | Else | | |
| | corrected number = corrected number + numstr[count] | Calc. | |
| | count = count + 1 | | |
| | Display the number | print | |

Name:- Yash Raj  Roll-no:- 24K-0737  Date:

**Problem #11:-**

Remainder = 0 (co-prime)
Remainder ≠ 0 (Not co-prime)

**flowchart:-**



Name:- Yash Raj  Roll-no:- 24K-0737  Date:-

## Pseudocode:-

1- Start
2- Input two numbers a, & b:
    GCD = i , i = 1
3- Calculate:-
    a % i = 0 && b % i == 0
    Repeat(i++)
    Until (i > b) || (i > a)
    if (GCD != 1)
    display (Not a Co-prime number)
  Else (GCD = 1)
    display (Co-prime number)
4- End

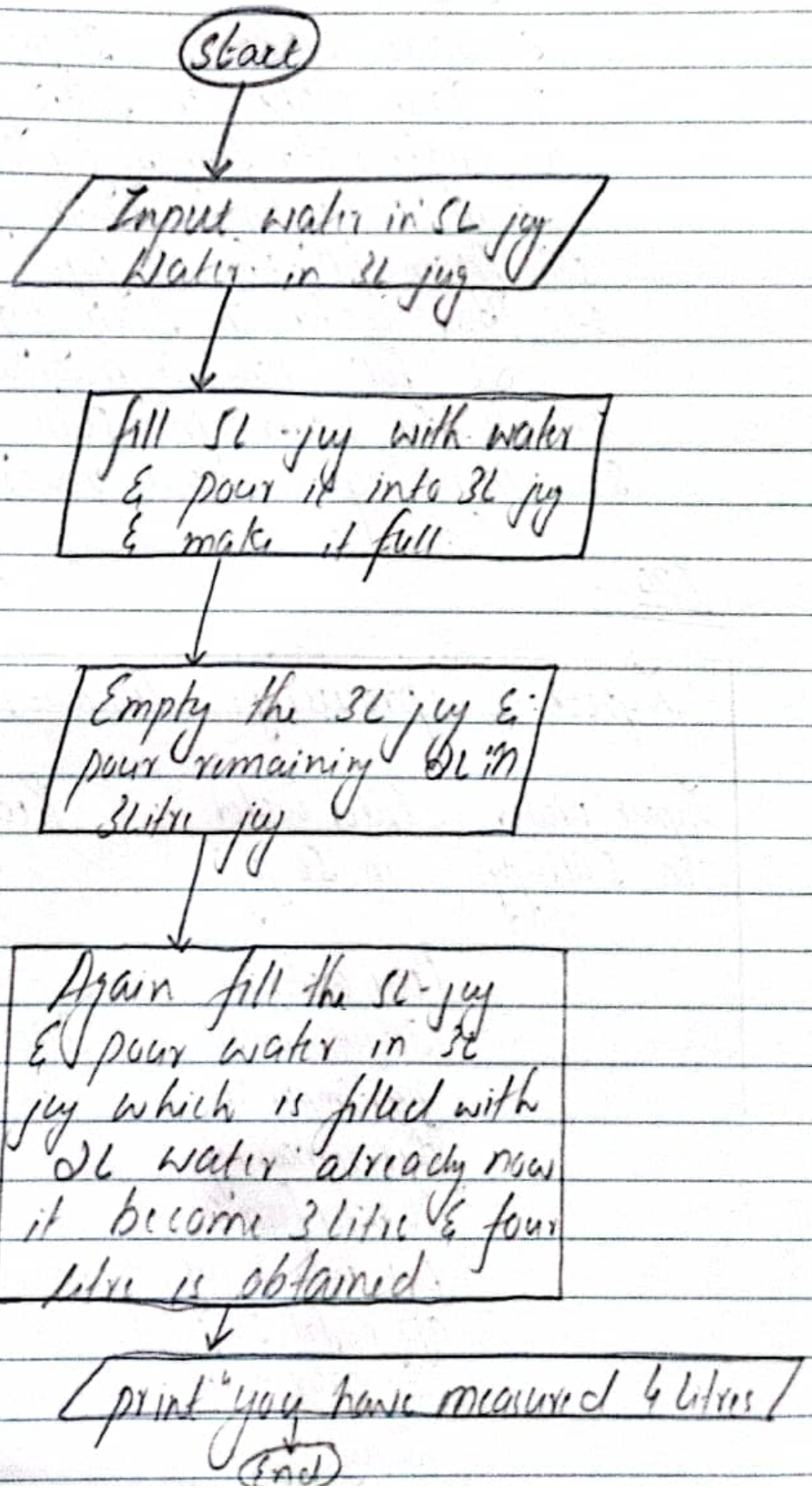
## IPO:-

| Input:- | processing:- | Module-Reference:- | Output |
|---|---|---|---|
| 1- Enter a&b | Enter a&b | Read | |
| | ~~Calculate~~ | | |
| | Check | | "Not a Co-prime number" |
| | a%i==0 && b%i=0 | check | |
| | if(GCD!=1) | | |
| | print(Not a coprime) | | |
| | Else | print | "Co-prime number" |
| | GCD=1 | | |
| | Print(Co-prime number) | | |
| | End | End | |

Name:- Yash-Raj  Roll-no:- 24K-0737.

## Problem #12:-

### flowchart:-



Name:- Yash Raj  Roll-no:- 24K-0737

## Pseudocode:-

1- Start
2- Input "water in 5L jug".
3- Pour water in 3Litre jug from 5L jug until it is full
4- Empty water from 3L jug & pour remaining 2L water from 5Litre jug to 3Litre jug.
5- Again fill the 5L jug.
6- Pour water in 3Litre jug which is already 2L full now it become 3Litre full.
7- 4 litre water in 5litre jug is obtained.
8- print "you have measured 4litre water".
End.

## IPO:-

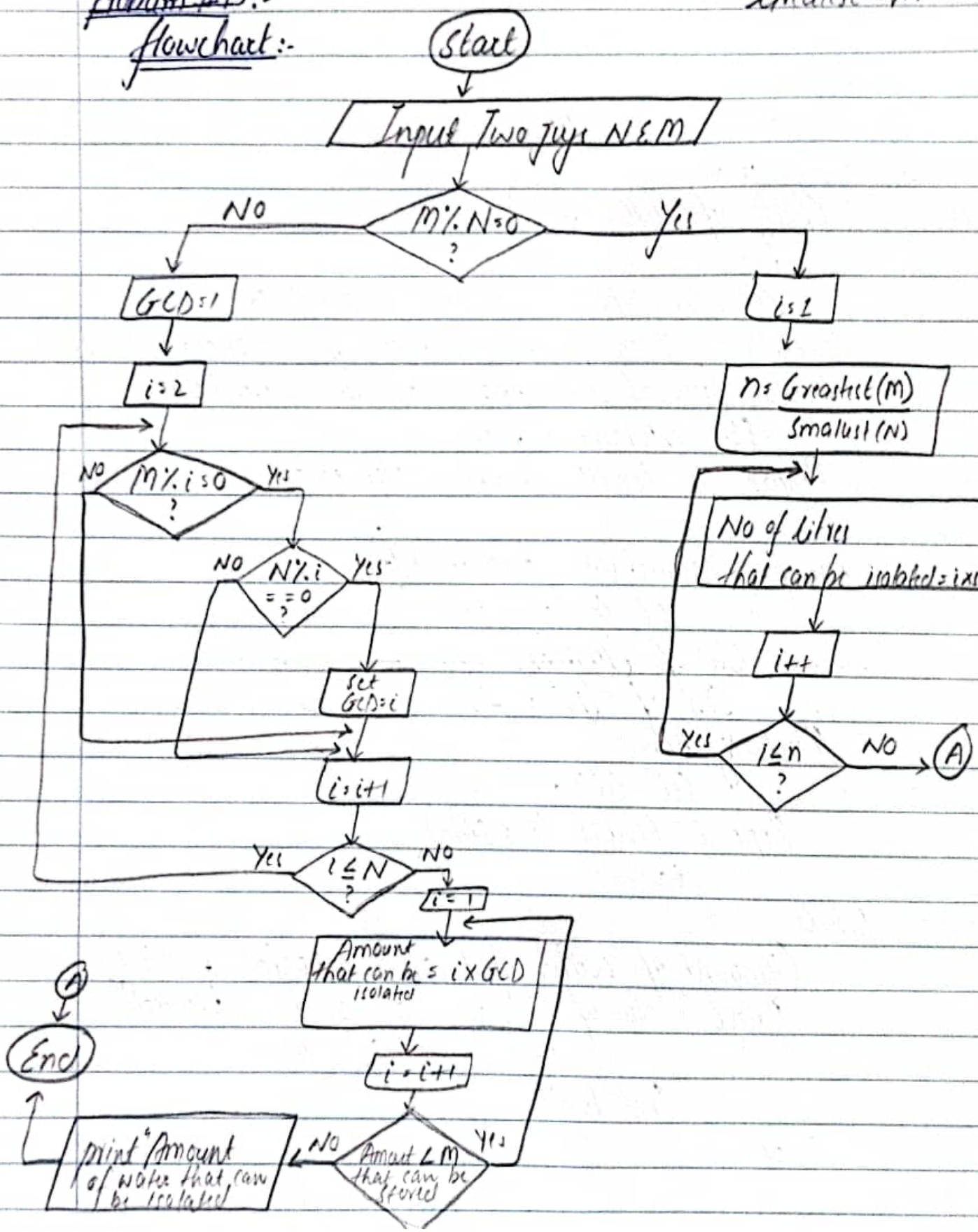
| Input:- | processing:- | Module Reference:- | Output:- |
|---|---|---|---|
| Input "water in 5litre jug" | Enter "water in 5L jug" | Read. | |
| | Pour water in 3L jug from 5L jug, Empty 3L after remaining 2L water from 5L jug into 3L jug again fill 5L jug & pour 1L in 3L jug, 4litre obtained. | Calculate. | "you have measured 4litre" |

Name:- Yash Raj  Roll-no:- 24K-0737  Date:

Smallest = N
Greatest = M

Problem #13:-

Flowchart:-



Name:- Yash Raj  Roll no:- 24k-0737  Date:

Pseudocode:-

1- Start
2- Input 2 jugs N & M.
3- // Process:
Check if (M%N==0)
then
// intialization: Set i=1  n= M/N
Calculate: no of litres that can be isolated: i×N
display (no: of litres that can be extracted).
&& increment, i++
Repeat it until i≤n, else end.

else if (greatest(M)% smallest(N)==0)
then set GCD=1  i=2
~~Else~~ if (M% i==0)
Else if (N% i==0)
//intialization
Set GCD=1  i++
Repeat Until (i ≤ ~~Sum~~ N)
i=1

While
(Amount of Water that can be extracted = i×GCD)
Print "No: of litres that can be extracted)"
i++, i×GCD < M
End While

End.

Name:- Yash Raj  Roll no:- 24K-0737

Q No:-

| Input:- | Processing:- | Module Reference | Output:- |
|---|---|---|---|
| Input 2 jugs N & M | Enter jugs M & N | Read | |
| | Check if (M%N==0) then set i=1, n=M/N | Check | |
| | Calculate no of litres that can be isolated = i×N | calculate | |
| | Display "number of litres that can be extracted" & increment, i++ Repeat it until i≤n, else end | print | "Amount of Water that can be isolated or extracted" |
| | else if (M%N!==0) then set GCD=1 | Check | |
| | i=2 if (M%i==0) Else if (N%i==0) | Check | |
| | Set GCD=1 i++ Repeat until (i≤N) | | |
| | i=1 While (Amount that can be extracted = i×N) print "No of litres that can be extracted" i++, i×GCD < M End while End | | |