Programming Fundamental Olympics

Problem 1: → Kmls to Mph

FlowChart:

```
        ( Start )
            ↓
      | Speed , S |
            ↓
   | S * 3600 * 0.62 |
   |   = Speed in    |
   |      mph        |
            ↓
   / "Speed in MPH" /
            ↓
        ( END )
```
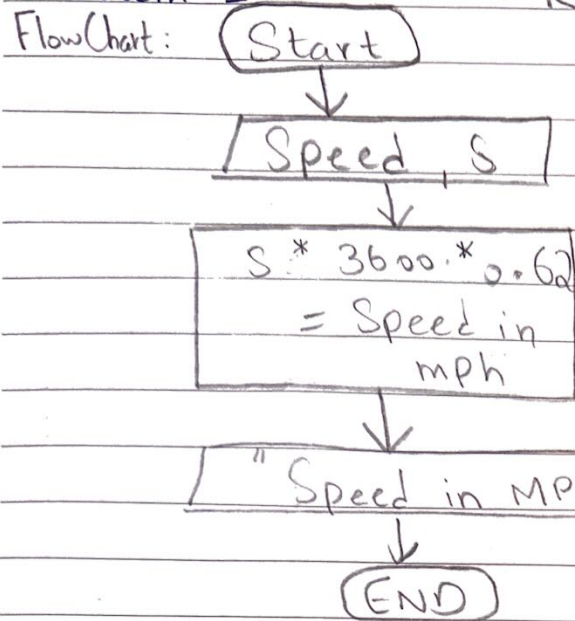
IPO:

1. Input Speed in kms
2. Speed * 3600 * 0.62
3. Output Speed in Mph

Pseudo code:

```
START
    Input Speed in kmls , s
    S * 3600 * 0.62 = Speed in MPh
    Output Speed in MPh
END
```

Problem 2: → EVEN OR ODD

FlowChart:

```
        ( Start )
            ↓
      / Value , a /
            ↓
  NO   < a > 0 >
            ↓ Yes
       < a % 2 >  NO →  "ODD"
       < == 0 >
            ↓ Yes
      / "EVEN" /
```

/ "Enter a Positive Number" /

(END)
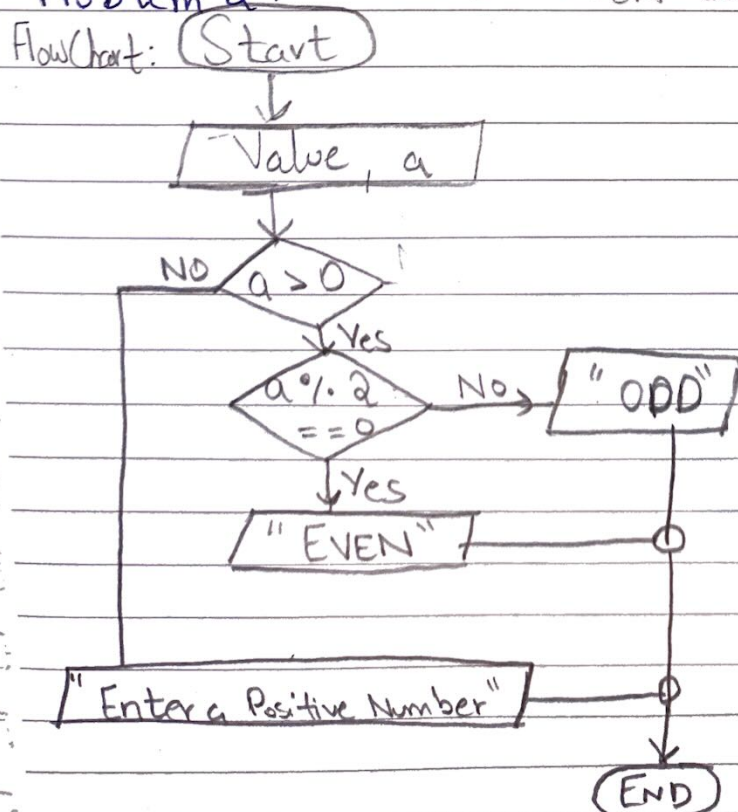
IPO:

1. Input a Number
2. Number is Positive
3. Number divisble by 2 give '0' as remainder
4. Output Even

Pseudocode:

```
START
    Input value, a
    WHILE, a > 0
        IF, a % 2 == 0
        PRINT "EVEN"
        IF NOT
        PRINT "ODD"
    ENDWHILE
END
```
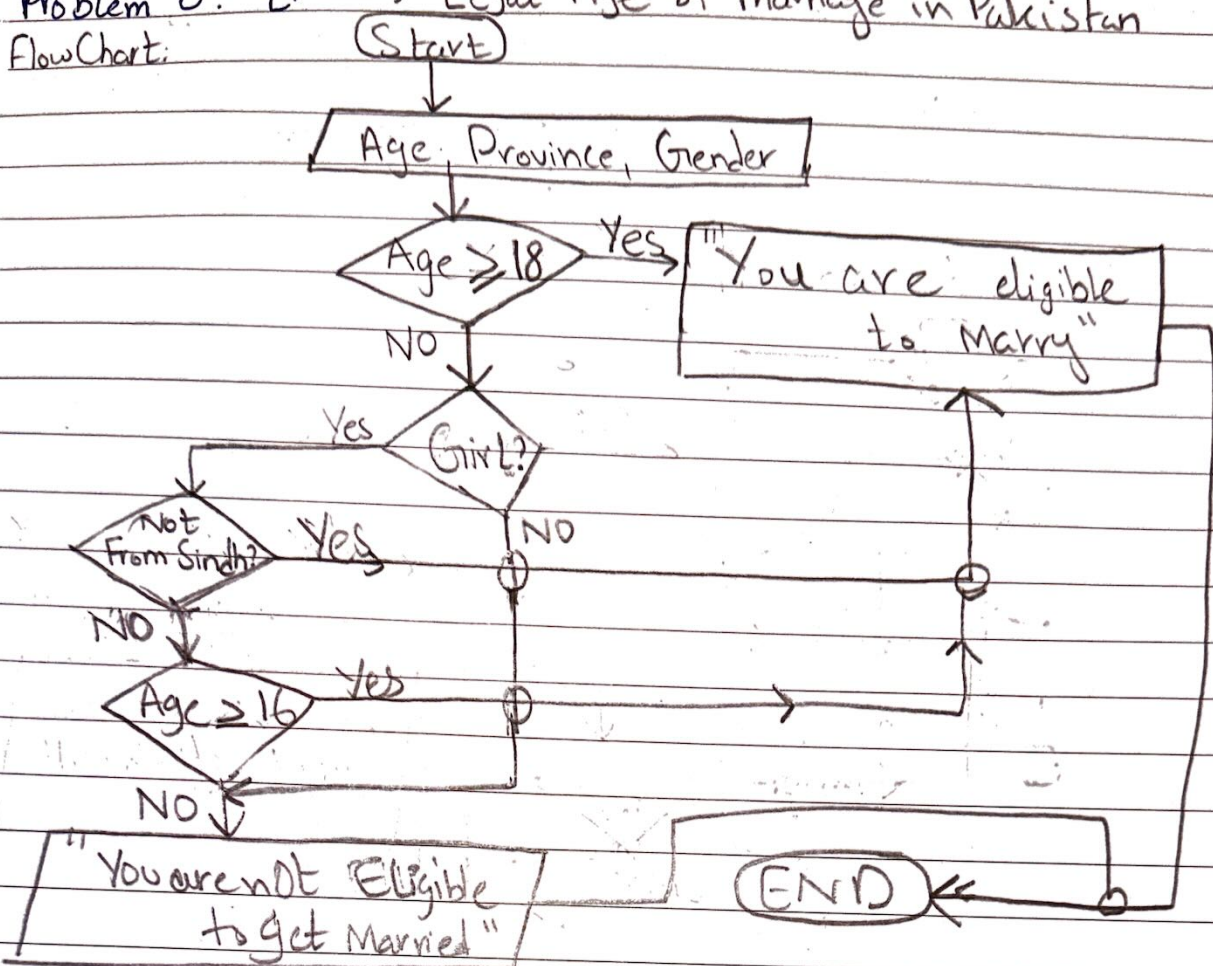
Problem 3: L. → Legal Age of Marriage in Pakistan

Flow Chart:

Pseudocode.
```
START
    Input Age, Gender, Province
    IF  , Age ≥ 18
        PRINT " You are eligible to get married "
    IF NOT,

            IF, Girl
                IF, Not From Sindh
                    PRINT "You are eligible to get married"
                IF NOT,

                        IF, Age ≥ 16
                            PRINT "You are eligible to get married"
                        IF NOT,
                            PRINT "You are not eligible to get married"
            IF NOT,
                PRINT "You are not eligible to get married"
END
```
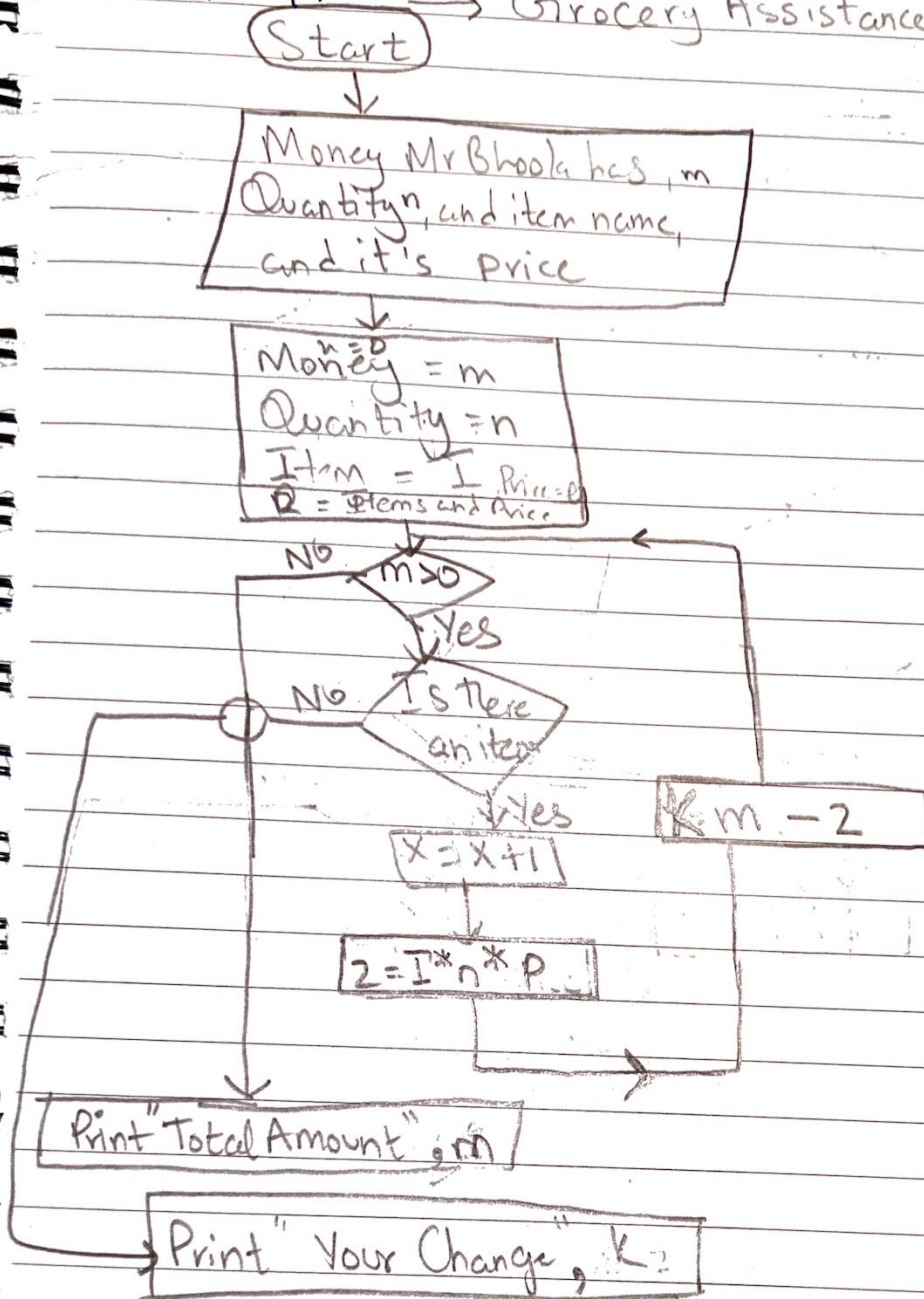
IPO:
1. Age, Province, Gender
2. Sindh > 18
3. Punjab and others
   Girl > 16, Boys > 18

Problem 4: → Grocery Assistance Calculator

```
        ( Start )
            |
            v
   +-------------------------+
   | Money Mr Bhoola has, m  |
   | Quantity n, and item name, |
   | and it's price          |
   +-------------------------+
            |
            v
   +----------------------+
   |  Money = m           |
   |  Quantity = n        |
   |  Item = I  Price=p   |
   |  R = Items and Price |
   +----------------------+
       NO  / m > 0 \
      <---<         >
            \  Yes /
              |
        NO  / Is There \
       <---<  an item   >         K = m - 2
            \          /
              \  Yes /
                |
             X = X+1
                |
                v
           Z = I * n * P
```

Print "Total Amount", m

→ Print "Your Change", k

Pseudocode:
START
  Input money, item, quantity, price
  IF, money > 0
    IF, There is a item
    Then Z = Item * Quantity * Price
        K = Money - Z
    IF NOT
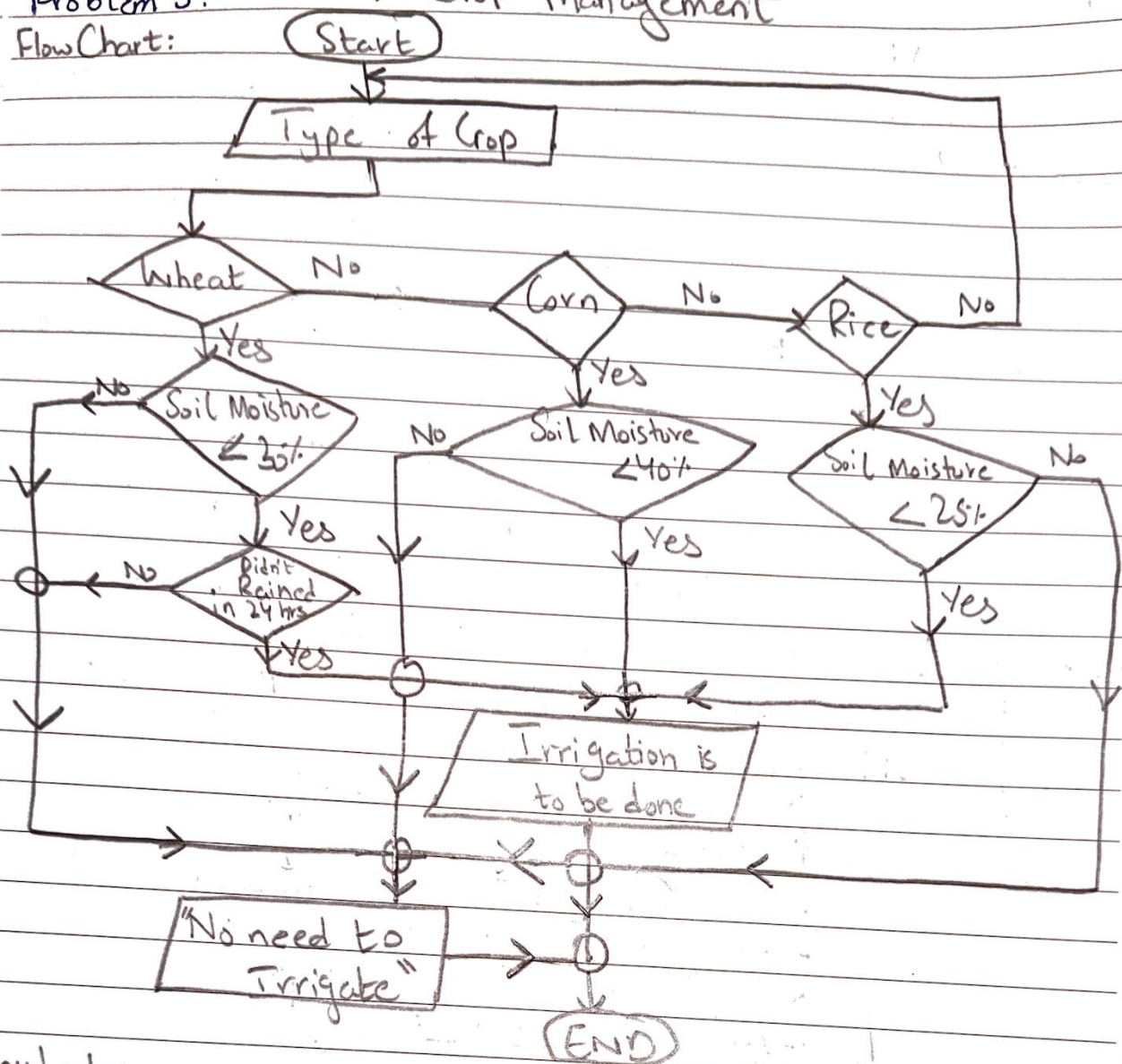   PRINT "Your Change", k
  IF NOT
    PRINT "Total Amount Spent", m
END

I.P.O:
1. Input Money
2. Item, Price, Quantity
3. Multiply item, price and quantity
4. keep the loop until money ends or the item
5. Output the total amount spend and if There is a
Change

Problem 5: → Crop Management

Flow Chart:

Pseudocode:

```
START
  Input Type of Crop
  IF, RICE
     IF SOIL MOISTURE < 25%
     THEN IRRIGATE
     IF NOT,
        THEN NO NEED To IRRIGATE
  IF NOT
  THEN IF, Corn
     IF Soil Moisture < 40%
        THEN IRRIGATE
     IF NOT
        THEN NO NEED To IRRIGATE
  THEN IF NOT,
     IF, RICE
```

```
IF RIEE
   IF Soil Moisture < 30%
     IF, Didn't Rained in 24 hrs
     THEN, IRRIGATE
     IF NOT
   IF NOT
   THEN, NO NEED To IRRI...
IF NOT,
   END
```

IPO:
1. Type of Crop
2. If Wheat, The Soil moisture is below 30% and it has not rained in last 24 hrs, irrigation will ted.
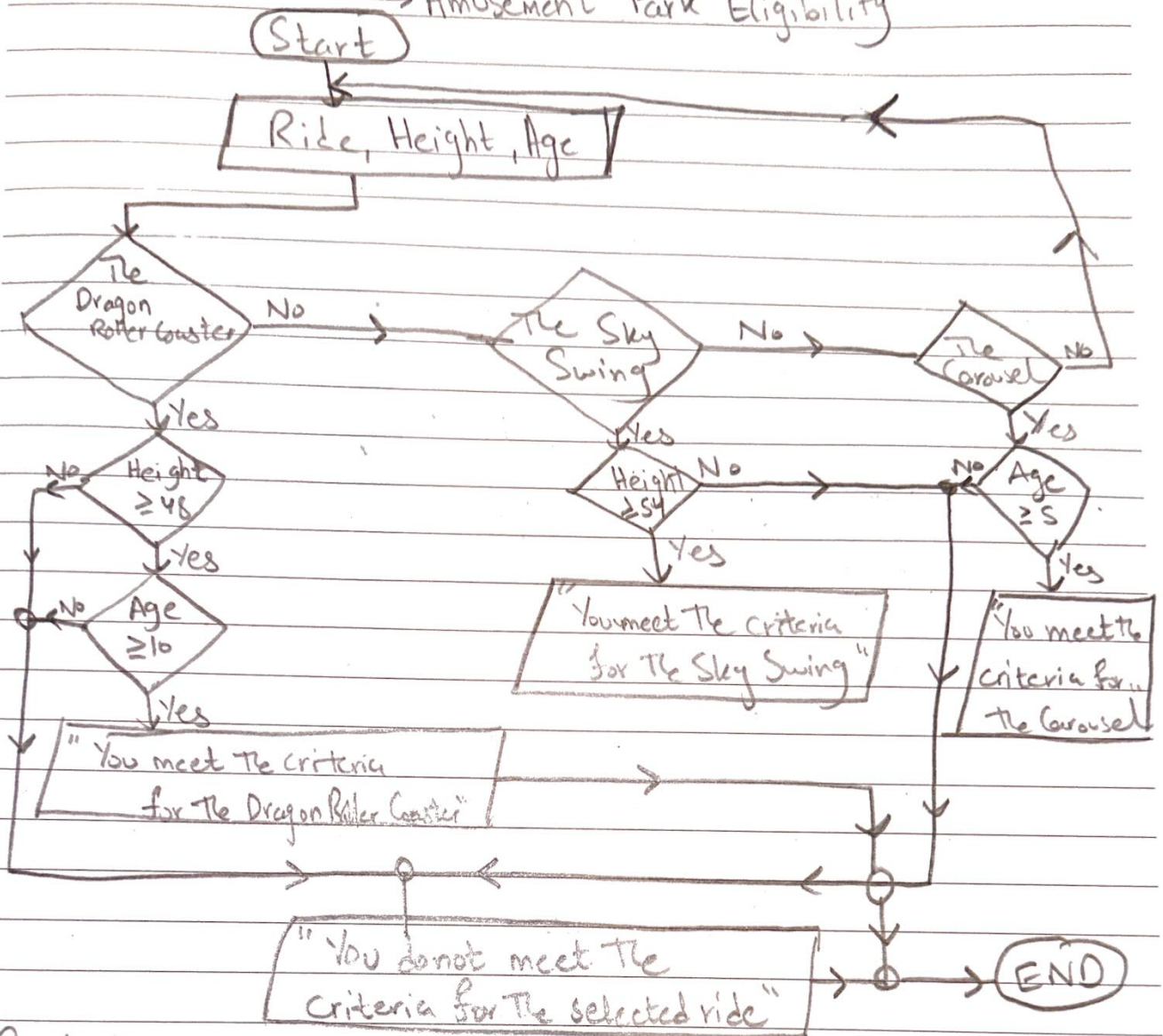3. If Corn, The soil moisture is below 40%, irrigation will be don
4. If rice, The soil moisture is below 25%, irrigation will be done

Problem 6:

→ Amusement Park Eligibility

Start

Ride, Height, Age

The Dragon Roller Coaster — No → The Sky Swing — No → The Carousel — No

Yes (Dragon): Height ≥ 48 — No → ... Yes → Age ≥ 10 — No → ... Yes → "You meet the criteria for The Dragon Roller Coaster"

Yes (Sky Swing): Height ≥ 54 — No → ... Yes → "You meet the criteria for The Sky Swing"

Yes (Carousel): Age ≥ 5 — No → ... Yes → "You meet the criteria for the Carousel"

"You do not meet the criteria for the selected ride"

END

Pseudocode:

```
START
    INPUT, Ride, Height, Age
    IF THE CAROUSEL
        IF, Age ≥ 5
        THEN, PRINT "You meet the criteria"
        IF NOT,
            THEN, PRINT "You do not meet the criteria"
        IF NOT
        THEN IF, THE SKY SWING
            IF, HEIGHT ≥ 54
            THEN, PRINT "You meet the Criteria"
            IF NOT
            THEN, PRINT "You do not meet the Criteria"
            IF NOT
            THEN IF, THE DRAGON ROLLER COASTER
                IF, Height ≥ 48
                IF, Age ≥ 10
                THEN, PRINT "You meet the Criteria"
                IF NOT,
                IF NOT, PRINT "You do not meet the Criteria"
        THEN, PRINT
END
```
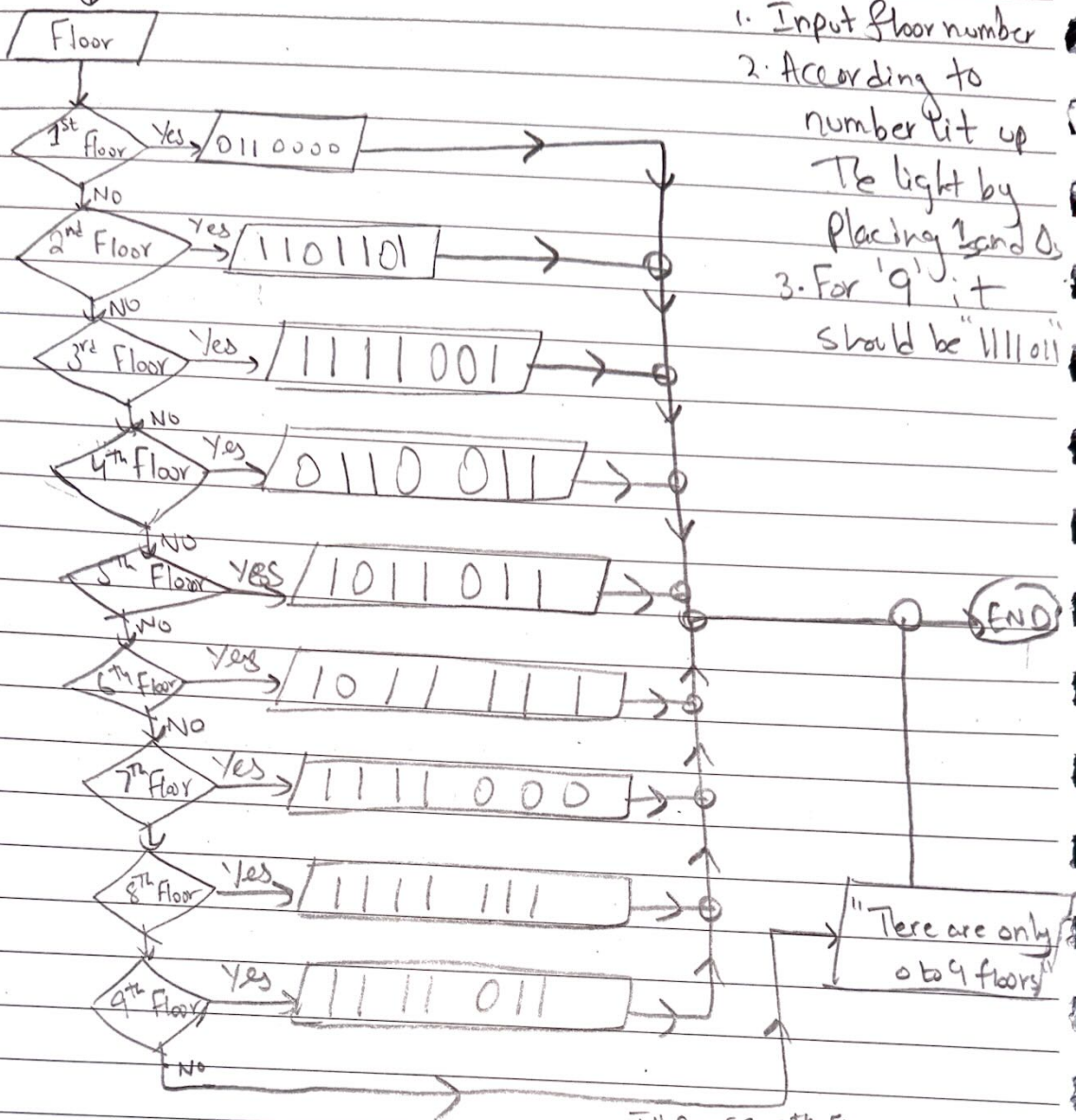
I.P.O:

1. Input Height, Age, Ride
2. If The Dragon Roller Coaster, Then height ≥ 48 inches and age ≥ 10 years
3. If The Sky Swing, Then height ≥ 54 inches.
4. If The Carousel, then age ≥ 5 years

Problem 7: Which Floor

Flow Chart:

IPO:
1. Input floor number
2. According to number lit up the light by placing 1's and 0's
3. For '9', it should be "111011"

THEN IF, 5th Floor
THEN, output 101101
THEN IF NOT
THEN IF, 6th Floor
THEN, output 1011 111
THEN IF NOT
THEN IF, 7th Floor
THEN, output 1111 000
THEN IF, 8th Floor
THEN, output 111111
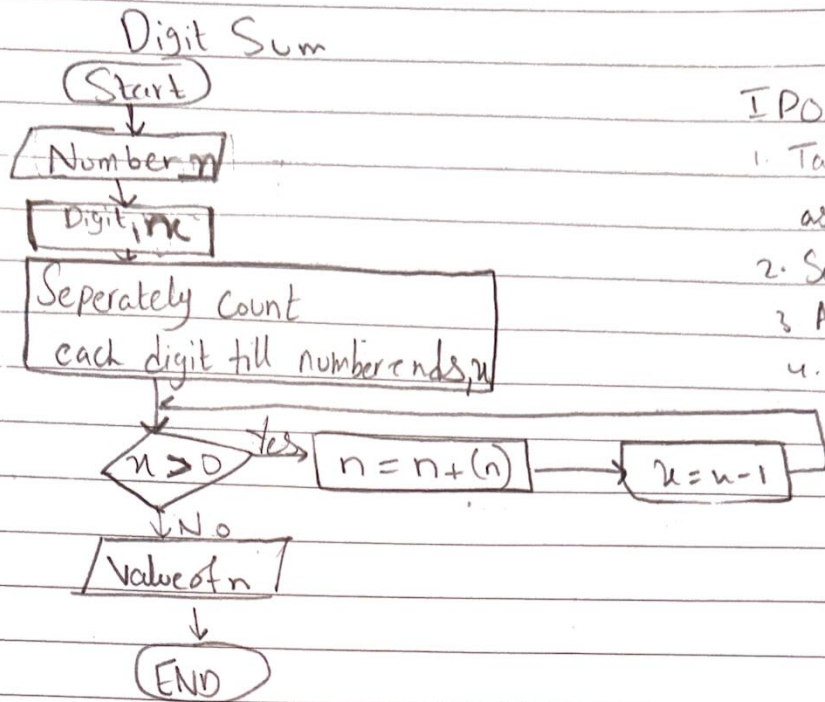THEN IF NOT
THEN IF, 9th Floor
THEN, output 111011
IF NOT
THEN, PRINT "There are only 0 to 9 floors"
END

Pseudocode:

START

  Input Floor Number
  IF, 1st Floor,
    THEN, output 0110000
  IF NOT,
    THEN IF, 2nd Floor
      THEN, Output 110 1101
    THEN IF NO
      THEN IF, 3rd Floor
        THEN, output 1111 001
    THEN IF NOT,
      THEN IF, 4th Floor
        THEN, output 0110 011
      THEN IF NOT

Problem 8:   Digit Sum

FlowChart:

(Start)

↓

| Number m |

| Digit, m |

| Seperately count each digit till number ends, u |

↓

$n > 0$ → Yes → | $n = n + (n)$ | → | $u = u - 1$ |

↓ No

| Value of n |

↓

(END)

IPO:
1. Take a number as a input
2. Seperate it
3. Add all the values
4. Output the sum

Pseudocode:

START

     Input a Number, seperate each digit by $n_1, n_2, n = 0$
     Count the number of digits of the number entered, u -
     If, $u = 0$
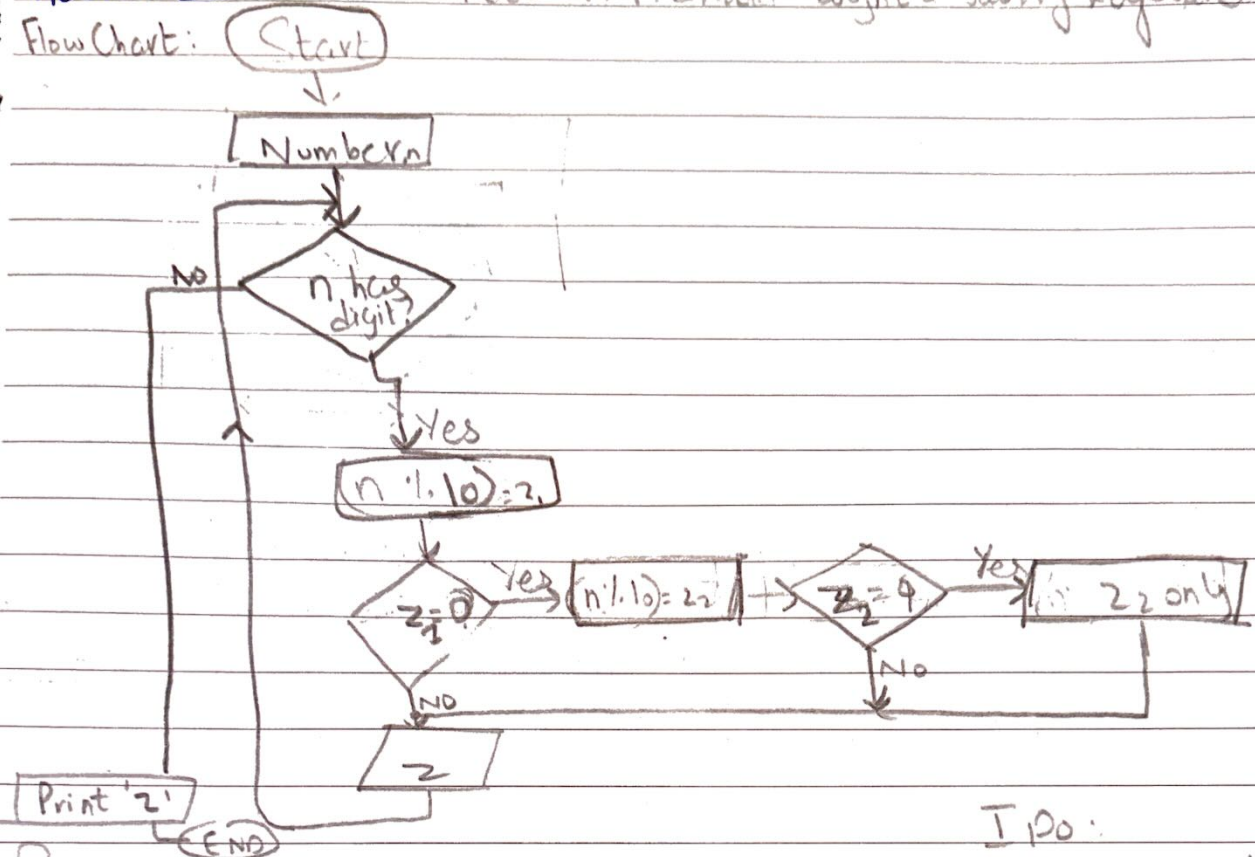
        THEN, $n = n + (n)$ and $u = u - 1$
       IF NOT

         THEN, output the value of 'n'

END

Problem 10 : Poor Mr. Rhoda bought a faulty keyboard

Flow Chart :

Start

Number n

No ← n has digit?

Yes

$n \% 10 = z_1$

$z_1 = 0$ —Yes→ $n \% 10 = z_2$ → $z_2 = 9$ —Yes→ z_2 only

No

z

Print 'z'

END

Pseudocode

```
START
    INPUT Number, n
    IF n has digits
    THEN , n % 10 = z₁
        IF z₁ = 0
        THEN n % 10 = z₂
        IF z₂ = 9
        THEN output 'z₂' only to 'z'
        IF NOT
        THEN output 'z₁' and 'z₂' to z
    IF NO
    THEN output 'z₁' to 'z'
    IF NOT
    THEN PRINT z
    END
```

TODO :

1. Enter a number
2. n has digits
3. if n % 10 = z, if $z_1 = 0$, Then n % 10 = z₂
   If z₂ = 9 Then only z₂ to be printed.
4. If not Then keep printing z and n % 10

Problem 11: No not optimus prime its Coprime

FlowChart:

T.P.O:
1. Input two numbers
2. $n > 1$
2. $n_1 \% x$, till $x = n_1$, $n_1 \% x = a$
3. $n_2 \% x$ till $x = n_2$, $n_2 \% x = b$
5. a and b if not common then number is a Coprime.

Flowchart text:
Start
Input a number, n_1
Input a number, n_2
$x > 1$
$n_1 ! == x$ — NO — $n_2 ! == x$ — No
Yes → $n_1 \% x = a$
Yes → $n_2 \% x = b$
$x = x+1$ ← " a "
" b " → $x = x+1$
Common digits exist of a and b
No → Print "Numbers are Coprime"
Yes → Print "Numbers are not Coprime"
END

Pseudocode:
START
  INPUT numbers, n_1, n_2
  $x > 1$
  If $n_1 ! == x$
  THEN, $n_1 \% x = a$ and $x = x+1$, output a
  If not
    THEN IF, $n_2 ! == x$
      THEN, $n_2 \% x = b$, and $x = x+1$, out b
      IF not,
        THEN IF there are common digit of a and b
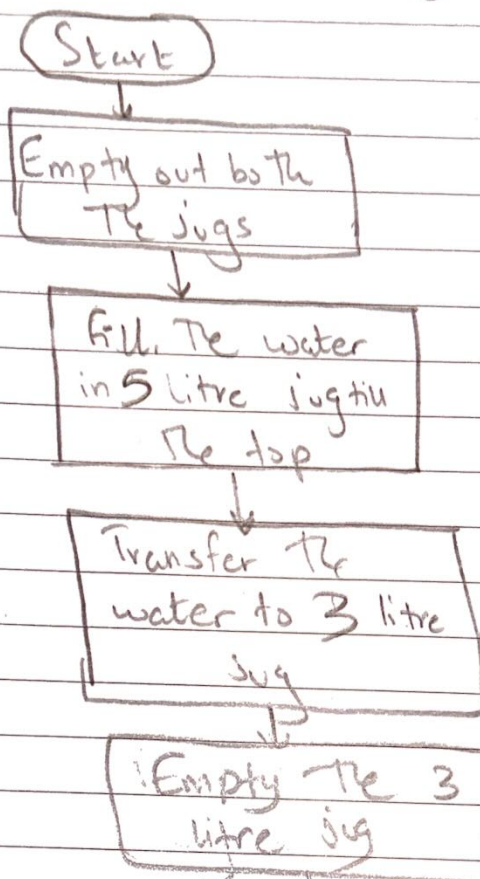   PRINT, " Numbers are not Coprime"
        IF NOT
        PRINT "Number are Coprime "
END

Problem 12: Die Hard - Defusing The Bomb

Flow Chart:

Start

↓

Empty out both The jugs

↓

Fill The water in 5 litre jug till The top

↓

Transfer The water to 3 litre jug

↓

Empty The 3 litre jug

↓

Pour The remaining 2 litres from The 5 litre jug into 3 litre jug

↓

Fill The 5 litre jug again

↓

Pour water from 5 litre jug into The 3 litre jug till top

↓

Place The 5 litre jug on The sensor

↓

Print "You Survived"

↓

END

T.P.O.:

1. Fill the water in 5 litre jug
2. Transfer The water to 3 litre jug
3. Empty The 3 litre jug
4. Pour The 2 litre remaining into 3 litre jug
6. Fill The 5 litre jug again
7. Pour 5 litre jug to 3 litre till it fills
8. Now you have 4 litres in 5 litres jug

Pseudo Code:

```
START
  . Empty out both of jugs
  . Fill The water in The 5 litre jug till The top
  . Transfer The water to 3 litre jug
  . Empty The 3 litre jug
  . Transfer The 5 litre jug into The 3 litre jug
  . Fill The 5 litre jug again
  . Pour water in 3 litre from 5 litre jug
  . Put 5 litre jug on The sensor
  . Print "You survived"
END
```