Lab No: 01 By Ali Rooman (24K-0792)

**PAC Charts**

Q1: Problem: Ask the user to find the smallest of three numbers entered by the user. The

User will take 3 random values as input. (Note they can be constants).

Ans. **PAC chart for Q1**

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| --- | --- |
| Step | Description |
| Problem | Find the smallest of three number input by the user |
| Input | Three numbers (num1, num2, num3) |
| Output | The smallest number among three inputs |
| Processing | -Accept three numbers from user  -Compare the three numbers to determine the smallest  -Display the smallest number |
| Assumptions | -Input will be a numeric value can be integer or floating point.  -No need to handle no invalid or non-numeric input |
| Algorithm | 1. Start  2. Input num1, num2, num3  3. If num1 is less than num2 and num3, then smallest = num1  4. Else if num2 is less than num1 and num3, then smallest = num2  5. Else, smallest = num3  6. Output smallest  7. End |

Q2: Problem: Calculate the product of the digits of a given number.

Ans. **PAC chart for Q2**

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| --- | --- |
| Step | Description |
| Problem | Calculate the product of digits of a given number. |
| Input | A single integer number (e.g:1,2,3,4….). |
| Output | The product of all the digits in the input number. |
| Processing | - Extract each digit from the number. - Multiply all the extracted digits together. - Output the result. |
| Assumptions | - Handle only numeric input (no letters or special characters). - If the number is 0, the product should be 0. |

Q3: Problem: Determine if a given year is a leap year or not. Alternatively, the user would

take two dates as input and calculate the number of days between them to check if the

year is a leap year.

Ans. **PAC Chart for Q3**

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| --- | --- |
| Step | Description |
| Problem | Determine if given year is a leap year or not. |
| Input | A single integer representing a year (e.g:2024 etc.). |
| Output | A message indicating whether the year is a leap year or not. |
| Processing | - Check if the year is divisible by 4. - If it is divisible by 100, check if it is also divisible by 400. - Based on these checks, determine if it is a leap year. |
| Assumptions | - Handle only numeric input (no letters or special characters). - If the number is 0, the product should be 0. |

**Input process output chart**

Q Problem: Calculate the product of the digits of a given number. Alternatively, the user

would take two numbers as input, multiply them, and then create an IPO

(Input-Process-Output) Chart for it.

|  |  |  |
| --- | --- | --- |
| Input | Process | Output |
| -Single integer number  (e.g., 31,42,58…. ) | 1. Initialize product to 1 2. Extract each digit using loop 3. Multiply digits with product 4. Continue until all numbers are processed | -Product of digits  (e.g., 24 for 1234) |

**Flow Charts**

Problem: Calculate the volume of a cylinder given its height and radius.

Ans.

End

Output Volume ‘V’

Calculate Volume

V = π \* r 2  \* h

Input Height ‘h’

Start

Input Radius ‘r’

Problem: Calculate your aggregate of FAST based on grade of intermediate/ equivalency.

Ans.

End

Output Aggregate

Calculate aggregate

Aggregate =0.4\*Intermediate + 0.1\*Matric + 0.5\*NU Test

Input NU Test percentage

Input Matric percentage

Input Intermediate percentage

Start

Problem: Calculate the median of the digits of your roll number, for example: 24K-1234

then 2nd and 3rd term, their addition and the result divided by 2 is median i.e. 2.5.

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Add the 2nd and 3rd smallest digits

Find the 2nd and 3rd smallest digits (e.g., 2 and 2)

Sort the digits in ascending order (e.g., 1, 2, 2, 3, 4, 4)

Extract digits from the roll number

Input Roll No

Start

Output the median

END

Divide the result by 2 to find the median