# Introduction to Computer Programming(2024) Minor Project

\_\_\_Description & Output\_\_\_\_

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# **Problem 1:**

Assume the user enters the values 10, 11, 12 and 13.

### **Example Execution:**

1. User Input:

Enter 4 integer values for the original array:

Value 1: 10

Value 2: 11

Value 3: 12

Value 4: 13

#### 2. Initialization:

- The program initializes an array named original Array with the user-provided elements: [10, 11, 12, 13].
- 3. Printing Original Array:

Original array:

10 11 12 13

4. Printing Original Array in Binary:

Original array showing 32 bit binary value:

0000000000000000000000000001011

# 

#### 5. Rotation:

- 1. The **rotateRightBy2Bits** method is called to perform the rotation.
- 2. The last element (13) is temporarily stored in **lastElement**.
- 3. Each element, starting from the end, is shifted to the right by 2 bits, preserving the bits and handling overflow.
- 4. The first element is then rotated with the original last element.

### 6. Printing Rotated Array in Binary:

## 7. Printing Rotated Array:

#### 1073741826 -2147483646 -1073741821 3

In summary, the program takes user input for an array of 4 values (10, 11, 12, 13), prints it in both integer and binary forms, performs a right rotation by 2 bits, and then prints the rotated array in both integer and binary forms. The example shows how the elements are rotated, considering overflow and the specified rotation pattern based on the user's input.

# Output:-

```
■ Console ×
<terminated > Problem1_RotateRight [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (30-Jan-2024, 10:25:13 pm – 10:25:24 pm) [pid: 1144]
Enter 4 integer values for the original array:
Value 1: 10
Value 2: 11
Value 3: 12
Value 4: 13
Original array:
10 11 12 13
Original array showing 32 bit binary value:
0000000000000000000000000000001011
000000000000000000000000000001100
000000000000000000000000000001101
After rotation array showing 32 bit binary value:
1100000000000000000000000000000011
0000000000000000000000000000000011
After rotation array:
1073741826 -2147483646 -1073741821 3
```

# Problem 2:

Suppose we want to convert the decimal number 42 to base 5.

#### 1. Initialization:

- Decimal number (n): 42
- Target base (b): 5
- Empty StringBuilder named result

### 2. Loop Execution:

- In the loop, the remainder of the division (42 % 5) is calculated, and the corresponding character from digitsAndAlphabets is inserted at the beginning of result. The decimal number is then updated to be the result of the integer division (42 / 5).
- This process continues until the decimal number becomes zero.

#### **Iteration 1:**

remainder = 2

result: "2"

decimal number: 8

#### **Iteration 2:**

remainder = 3

result: "32"

decimal number: 1

## **Iteration 3:**

remainder = 1

result: "132"

decimal number: 0

#### 3. Final Result:

After the loop, the **StringBuilder** holds the reversed string representation of the number in the target base ("132").

## 4. Output:

The **StringBuilder** is converted to a string, and the final result is printed.

### **Decimal 42 to base 5: "132"**

# **Output:-**



## Taking some more examples

# **Output:-**

Decimal to binary:-

#### ■ Console ×

<terminated > Problem2\_ConvertToAnyBase [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (30-Jan-2024, 10:30:36 pm - 10:30:43 pm) [pid: 13580]

Enter a decimal integer: 4581

Enter the target base: 2

Decimal 4581 to base 2: 1000111100101

#### Decimal to octal:-

#### ☐ Console ×

<terminated> Problem2\_ConvertToAnyBase [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (30-Jan-2024, 10:30:08 pm – 10:30:18 pm) [pid: 8948]

Enter a decimal integer: 4581

Enter the target base: 8

Decimal 4581 to base 8: 10745

## Decimal to hexadecimal:-

#### ■ Console X

<terminated> Problem2\_ConvertToAnyBase [Java Application] C:\Program Files\Java\jdk-20\bin\javaw.exe (30-Jan-2024, 10:29:17 pm – 10:29:37 pm) [pid: 21852]

Enter a decimal integer: 4581 Enter the target base: 16

Decimal 4581 to base 16: 11E5



# Thank You

