PROGRAM 7

QUESTION:

Write a program to convert a decimal number to its equivalent octal number.

Specifications:

Class Name – Decioct

Instance Variable:

int d – to store the decimal number int oct – to store the octal number

Member Methods:

Decioct (int nn) – to initialize d = nn and oct with its default value.

int convert (int ) – will convert the number to its octal equivalent.

void display() – to display the equivalent octal number.

Implement main() function to create object and call the above methods.

**ALGORITHM:**

1. Start
2. Define a class named `Decioct`.
3. Declare instance variables `deci` (decimal input) and `oct` (octal equivalent) as integers.
4. Create a constructor `Decioct(int nn)`:
   * Initialize the `deci` instance variable with the input `nn`.
   * Initialize the `oct` instance variable with 0.

Algorithm for the `convert` Method:

1. Input: An integer `n` (decimal number).
2. Initialize an empty string `s`.
3. Loop until `n` becomes 0:
   * Calculate the remainder `r` when `n` is divided by 8.
   * Convert `r` to a string and concatenate it to the beginning of `s`.
   * Update `n` to be `n` divided by 8 (integer division).
4. Convert the string `s` to an integer `b` using `Integer.valueOf(s)`.
5. Output: The integer `b` (octal equivalent).

Algorithm for the `display` Method:

1. Convert the decimal number (`deci`) to its octal equivalent using the `convert` method.
2. Update the `oct` instance variable with the octal equivalent.
3. Display the octal equivalent using the `oct` instance variable.

Algorithm for the `main` Method:

1. Initialize a `Scanner` object `sc` to read user input.
2. Prompt the user to enter a decimal number.
3. Read the decimal number using `sc.nextInt()` and store it in the variable `dec`.
4. Create an instance of the `Decioct` class, named `obj`, with `dec` as the argument to the constructor.
5. Call the `display` method on the `obj` instance to convert and display the octal equivalent. END.

**VARIABLE DESCRIPTION TABLE**

|  |  |  |
| --- | --- | --- |
| Variable Name | Data Type | Description |
| deci | int | Input decimal |
|  |  | number |
| oct | int | Octal equivalent of |
|  |  | the decimal |
|  |  | number |
| nn | int | Temporary |
|  |  | variable for |
|  |  | constructor |
| n | int | Temporary |
|  |  | variable for |
|  |  | `convert` method |
| r | int | Remainder of |
|  |  | division by 8 |
| s | String | String |
|  |  | representation of |
|  |  | octal number |
| b | int | Converted octal |
|  |  | integer |
| sc | Scanner | Scanner object for |
|  |  | user input |
| obj | Decioct | Instance of the |
|  |  | `Decioct` class |