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VIDYAVIHAR UNIVERSITY

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T R U S T

Course Name:	Structured Programming Methodology	Semester:	I
Date of Performance:	16/9/2025	DIV/ Batch No:	A1
Student Name:	Arav Arun	Roll No:	16010125013

Experiment No: 1
Title: Working with data types and operators

Aim and Objective of the Experiment:
Write a program in C++ to demonstrate the use of data types and operators

COs to be achieved:
CO1: Formulate a problem statement and develop the logic (algorithm/flowchart) for its Solution..

Theory:
1. Area and Circumference of Circle. Ask the user to enter the value of the radius of a circle. Put the values in the formula for finding the area of a circle and the circumference of a circle and print the outcome for area of a circle and the circumference of a circle.   **2.** Input of the distance between two cities in kilometers and converting them into meters, centimeters, feet, and inches.   Ex- If there are two cities "Gwalior" and "Delhi", their distance is 500 kilometers, after converting the distance from a kilometer, the distance value will be 500000 meters, 1640420 feet, 19685050 inches, and 50000000 centimeters.

Problem Statements:
Write a program for the following   1. Compute the area and circumference of a circle.   2. Read the distance between two cities in km and print that distance in meters, feet, inches, and centimeters.

Code :

Program 1 :
```cpp
#include <iostream>
using namespace std;

int main(){
    double radius=0;
    cout << "Enter radius of the circle : "<<endl;
    cin>>radius;
    double area = 3.14*radius*radius;
    double Circumference = 2*3.14*radius;
    cout<<"Area of the circle : "<<area<<endl;
    cout<<"Circumference of the circle : "<<Circumference<<endl;
    return 0;
}
```

Program 2 :
```cpp
#include <iostream>
using namespace std;

int main(){
    double distance=0;
    cout << "Enter distance between two cities in km : "<<endl;
    cin>>distance;
    double dcm=distance*100000;
    double dm=distance*1000;
    double dfeet=distance*3280.84;
    double dinches=distance*39370.1;

    cout<<"The distance in cm : "<<dcm<<" cm"<<endl;
    cout<<"The distance in m : "<<dm<<" m"<<endl;
    cout<<"The distance in feet : "<<dfeet<<" feet"<<endl;
    cout<<"The distance in inches : "<<dinches<<" inches"<<endl;
    return 0;
}
```
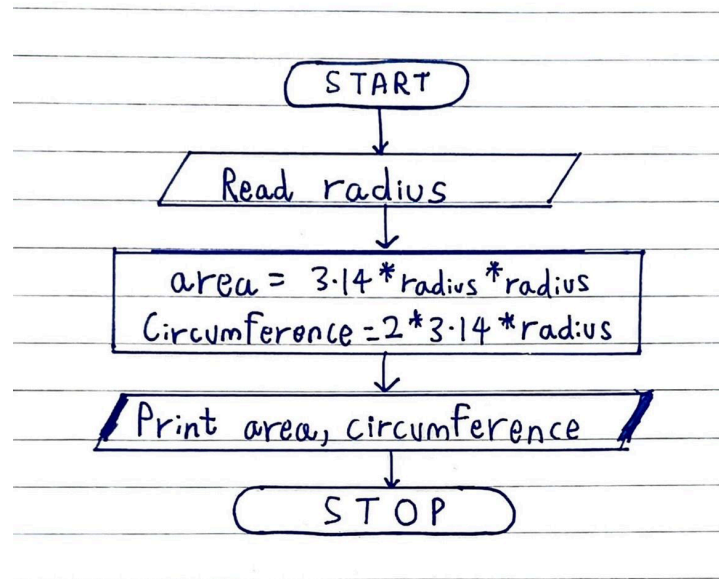
Output:

Output 1 :

```
Enter radius of the circle :
12
Area of the circle : 452.16
Circumference of the circle : 75.36

Process returned 0 (0x0)   execution time : 2.529 s
Press any key to continue.
```
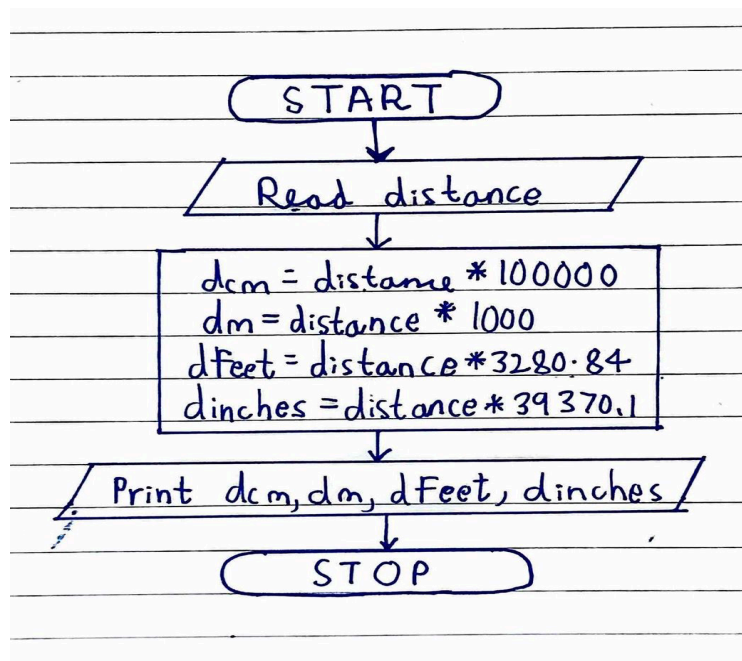
Output 2 :

```
[Enter distance between two cities in km :
 2
 The distance in cm : 200000 cm
 The distance in m : 2000 m
 The distance in feet : 6561.68 feet
 The distance in inches : 78740.2 inches
```
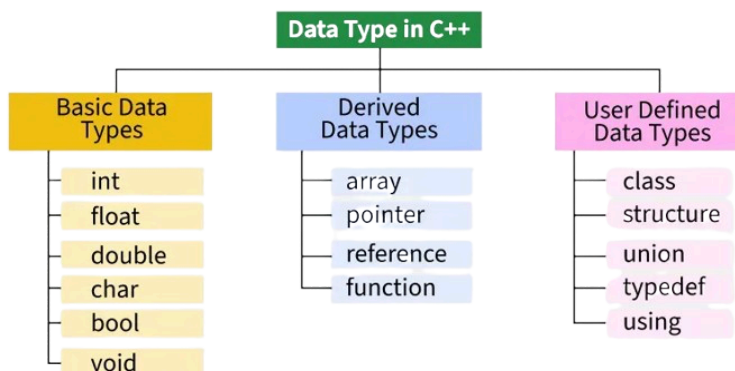
Flowchart:

Flowchart for Program 1:

```
                    START
                      |
              /  Read radius  /
                      |
        +-------------------------------+
        | area = 3.14 * radius * radius |
        | Circumference = 2*3.14*radius |
        +-------------------------------+
                      |
          / Print area, circumference /
                      |
                    STOP
```

Flowchart for Program 2:

```
                    START
                      |
              /  Read distance  /
                      |
        +------------------------------+
        | dcm = distance * 100000      |
        | dm = distance * 1000         |
        | dfeet = distance * 3280.84   |
        | dinches = distance * 39370.1 |
        +------------------------------+
                      |
        / Print dcm, dm, dfeet, dinches /
                      |
                    STOP
```

Post-Lab Subjective/Objective type Questions:

1.What are the basic data types in C++?
Sol :

Basic data types in C++ are :
● Int: Integer data type is used to store whole numbers.
● float: Float data type is used to store single-precision floating-point numbers.
● double: Double data type is used to store double-precision floating-point numbers.
● char: Char data type is used to store a single character
● bool: Bool data type is used to store boolean values (true or false).
● void: Void data type represents the absence of a value or return type.

2.Write a table for Operator Precedence and associativity?
Sol:

Operator	Name	Associativity
() [] -> .	Function call, Subscript, Member access	Left to Right
++ --	Increment/Decrement	Right to Left
! ~ - +	Logical/Bitwise NOT, Unary plus/minus	Right to Left
* / %	Multiplication, Division, Modulus	Left to Right
+ -	Addition, Subtraction	Left to Right
<< >>	Bitwise shift	Left to Right

< <= > >=	Relational operators	Left to Right
== !=	Equality operators	Left to Right
&	Bitwise AND	Left to Right
^	Bitwise XOR	Left to Right
|	Bitwise OR	Left to Right
&&	Logical AND	Left to Right
||	Logical OR	Left to Right
?:	Ternary conditional	Right to Left
= += -= *= /= %= &= ^= |= <<= >>=	Assignment and compound assignment	Right to Left
,	Comma	Left to Right

Conclusion:

In this experiment, I wrote C++ programs to demonstrate the use of data types and operators. By solving problems like calculating the area and circumference of a circle and converting distances into different units, I learned how different data types (int, double, etc.) and arithmetic operators are applied in real world scenarios.This experiment helped me strengthen my understanding of basic programming concepts.

Signature of faculty in charge with Date:

Structured Programming Methodology

Semester: I   Academic Year: 2025-26