Institute of Computer Technology
B. Tech. Computer Science and Engineering
Sub: DS Branch: BDA Class: A

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Sem: 3
Class: A
Subject: DS
Practical: 02
Date: 04/08/24

Practical: 02

1) Calculator
   Write a program that asks the user to enter two numbers, obtains them from the user and prints their sum, product, difference, quotient and remainder.

Prac-2Que-1.c > main()

```c
#include <stdio.h>

int main() {
    int num1, num2;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);

    int sum = num1 + num2;
    int product = num1 * num2;
    int difference = num1 - num2;
    int quotient = num1 / num2;
    int remainder = num1 % num2;

    printf("Sum: %d\n", sum);
    printf("Product: %d\n", product);
    printf("Difference: %d\n", difference);
    printf("Quotient: %d\n", quotient);
    printf("Remainder: %d\n", remainder);

    return 0;
}

```

```
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2> cd "c:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\P
ractical-2\" ; if ($?) { gcc Prac-2Que-1.c -o Prac-2Que-1 } ; if ($?) { .\Prac-2Que-1 }
Enter first number: 15
Enter second number: 12
Sum: 27
Product: 180
Difference: 3
Quotient: 1
Remainder: 3
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2>
```

2) Cost Price Problem

Suppose, a user enters the total selling price of 15 items and the profit earned on the total. Write a program to find out the cost price of one item.

Prac-2Que-2.c > ...

```c
#include <stdio.h>

int main() {
    float total_selling_price, total_profit;
    float cost_price_per_item;

    printf("Enter the total selling price of 15 items: ");
    scanf("%f", &total_selling_price);
    printf("Enter the total profit earned: ");
    scanf("%f", &total_profit);

    float total_cost_price = total_selling_price - total_profit;
    cost_price_per_item = total_cost_price / 15;

    printf("Cost price of one item: %.2f\n", cost_price_per_item);

    return 0;
}
```

```
PROBLEMS 4  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SQL CONSOLE
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2> cd "c:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practi
cals\DS\Practical-2\" ; if ($?) { gcc Prac-2Que-2.c -o Prac-2Que-2 } ; if ($?) { .\Prac-2Que-2 }
Enter the total selling price of 15 items: 1520
Enter the total profit earned: 120
Cost price of one item: 93.33
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2>
```

3) Separating Digits in an Integer

Write a program that inputs one five-digit number, separates the number into its individual digits and prints the digits separated from one another by three spaces each. [Hint: Use combinations of integer division and the remainder operation.]

For example, if the user types in 42139, the program should print Output: 4 2 1 3 9

Prac-2Que-3.c > main()

```c
#include <stdio.h>

int main() {
    int number, digit1, digit2, digit3, digit4, digit5;

    printf("Enter a five-digit number: ");
    scanf("%d", &number);

    digit1 = number / 10000;
    digit2 = (number / 1000) % 10;
    digit3 = (number / 100) % 10;
    digit4 = (number / 10) % 10;
    digit5 = number % 10;

    printf("%d   %d   %d   %d   %d\n", digit1, digit2, digit3, digit4, digit5);

    return 0;
}
```

```
PROBLEMS 4  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SQL CONSOLE                                Code

PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2> cd "c:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practic
al-2\" ; if ($?) { gcc Prac-2Que-3.c -o Prac-2Que-3 } ; if ($?) { .\Prac-2Que-3 }
Enter a five-digit number: 19764
1   9   7   6   4
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2>
```

2.4 Shapes with Asterisks

Write a program that prints the following shapes with asterisks.

```
* * * * * * * * * *          *              *
*                 *        * *            * *
*                 *      *   *          * * *
*                 *    *       *      * * * *
*                 *  *           *    * * * * *
* * * * * * * * * *      *   *
                          *
```

4)

Prac-2Que-4.c > main()

```c
#include <stdio.h>

int main() {
    for (int i = 1; i <= 5; i++) {
        for (int j = 1; j <= 5; j++) {
            if (i == 1 || i == 5 || j == 1 || j == 5) {
                printf("*");
            } else {
                printf(" ");
            }
        }
        printf("\n");
    }

    printf("\n");

    for (int i = 1; i <= 5; i++) {
        for (int j = 1; j <= 5; j++) {
            if (i == j || i + j == 6) {
                printf("*");
            } else {
                printf(" ");
            }
        }
        printf("\n");
    }

    printf("\n");

    for (int i = 1; i <= 5; i++) {
        for (int j = 1; j <= 5; j++) {
            if (j <= i) {
                printf("*");
            } else {
                printf(" ");
            }
        }
        printf("\n");
    }

    return 0;
}
```

```
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2> cd "c:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2\" ; if ($?) { gcc Prac-2Que-4.c -o
Prac-2Que-4 } ; if ($?) { .\Prac-2Que-4 }
*****
*   *
*   *
*   *
*****

*   *
 * *
  *
 * *
*   *

*
**
***
****
*****
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2>
```

5) Diameter, Circumference and Area of a Circle Write a program that reads in the radius of a circle and prints the circle's diameter, circumference and area. Use the constant value 3.14159 for π.

Prac-2Que-5.c > ...

```c
#include <stdio.h>

int main() {
    float radius, diameter, circumference, area;
    const float PI = 3.14159;

    printf("Enter the radius of the circle: ");
    scanf("%f", &radius);

    diameter = 2 * radius;
    circumference = 2 * PI * radius;
    area = PI * radius * radius;

    printf("Diameter: %.2f\n", diameter);
    printf("Circumference: %.2f\n", circumference);
    printf("Area: %.2f\n", area);

    return 0;
}
```

```
Prac-2Que-5 } ; if ($?) { .\Prac-2Que-5 }
Enter the radius of the circle: 5.03
Diameter: 10.06
Circumference: 31.60
Area: 79.49
PS C:\Users\jatin\OneDrive\Desktop\Academics\SEM - 3\Practicals\DS\Practical-2>
```