جامعة المستقبل
AL MUSTAQBAL UNIVERSITY

قسم الذكاء الاصطناعي
DEPARTMENT OF ARTIFICIAL INTELLIGENCE

SUBJECT:

STRUCTURED PROGRAMMING

CLASS:

1ST STAGE

LECTURER:

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LECTURE: (3)

PRACTICAL EXAMPLES OF FUNCTIONS

Example 1: Calculating the Squared Value of a Number

A function is used to calculate the square of a number. The main function calls this function for numbers from 1 to 10.

```
#include <iostream>
using namespace std;

// Function to calculate square of a number
int square(int num) {
    return num * num;
}

int main() {
    for (int i = 1; i <= 10; i++) {
        cout << "Square of " << i << " is " << square(i) << endl;
    }
    return 0;
}
```

Example 2: Calculating the Average of Two Numbers

A function is used to compute the average of two numbers entered by the user.

```
#include <iostream>
using namespace std;

// Function to calculate average of two numbers
double average(double num1, double num2) {
    return (num1 + num2) / 2.0;
}

int main() {
    double a, b;
    cout << "Enter two numbers: ";
    cin >> a >> b;
    cout << "Average: " << average(a, b) << endl;
    return 0;
}
```

Example 3: Summation of a Series

A function is used to compute the summation of a series:

```
#include <iostream>
using namespace std;

// Function to calculate summation of series
int sumSeries(int n) {
    int sum = 0;
    for (int i = 1; i <= n; i++) {
        sum += i;
    }
    return sum;
}

int main() {
    int n;
    cout << "Enter the number of terms: ";
    cin >> n;
    cout << "Summation of series: " << sumSeries(n) << endl;
    return 0;
}
```

Example 4: Finding the Largest Integer Among Three Numbers

A function is used to determine the largest number among three user inputs.

```
#include <iostream>
using namespace std;

// Function to find the largest number
int findLargest(int a, int b, int c) {
    return max(a, max(b, c));
}

int main() {
    int x, y, z;
    cout << "Enter three numbers: ";
    cin >> x >> y >> z;
    cout << "Largest number: " << findLargest(x, y, z) << endl;
    return 0;
}
```

Example 5: Summation of a Given Series

A function is used to calculate the summation of the following series:

Sum= $x - (x^3/3!) + (x^5/5!) - ...(x^n/n!)$

```
#include <iostream>
#include <cmath>
using namespace std;

// Function to calculate factorial
int factorial(int n) {
    int fact = 1;
    for (int i = 1; i <= n; i++) {
        fact *= i;
    }
    return fact;
}

// Function to compute the series sum
double computeSeries(double x, int n) {
    double sum = 0;
    for (int i = 1; i <= n; i += 2) {
        double term = pow(x, i) / factorial(i);
        if ((i / 2) % 2 == 0)
            sum += term;
        else
            sum -= term;
    }
    return sum;
}

int main() {
    double x;
    int n;
    cout << "Enter the value of x and number of terms: ";
    cin >> x >> n;
    cout << "Sum of series: " << computeSeries(x, n) << endl;
    return 0;
}
```