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| **erData Structures & Algorithms**  Diploma in CSF, IT  Year 2/3 (2020/21) Semester 4/6 | **Week 7** |
| **1 Hour** |
| **Tutorial 7 – Recursion** | |

1. Write a recursive function that will compute the sum of the first n integers in an array of at least n integers.

Hint: begin with the nth integer.

int array[] = {10, 20, 30, 40}

int calculate(int[] array, int n){

if(n == 0){

return 0

}else{

Return total = array[n] + (array[:n-1] - n-1)

}

}

2. Describe the problem with the following recursive function:

void printNum(int n)

{

cout << n <<endl;

printNum(n-1);

}

There is no base case, it will cause overflow

3. Given an integer n > 0, write a recursive function that returns the sum of 1 through n.

void calculate(int n){

if(n == 0){

}else{

}

}

4. Consider the following program:

int f(int n);

int main()

{

cout<< "The value of f(8) is " << f(8) << endl;

return 0;

}

// pre: n >= 0

int f(int n)

{

cout << "Function entered with n = " << n << endl;

if ( (n >= 0) && (n <= 2) )

return n + 1;

else

return f(n-2) \* f(n-4);

}

Show the exact output of the program. What argument values, if any, could you pass to the function f to cause an infinite recursion?