

**FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**BIE 20303 ALGORITHM & COMPLEXITIES**

**Group ASSIGNMENT**

**PREPARED FOR:**

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Q1 Use the step count method to estimate the time complexity of the following algorithm in which the run starts from the function CallSum (array1,array2,n). Then find the time complexity when n = 3, 6 and 10.

CallSum (array1,array2,n)

{

for (i=0; i<n; i++)

array2[i] = sum (array1, i+1);

}

sum (array,n)

{

total\_sum = 0;

for (i=1; i<=n; i++)

total\_sum = total\_sum + array[i];

return total\_sum;

}

(10 marks)

(C4: Analyze)

Q2 What is the total number of steps required to find a maximum element based on the algorithm below.

#include <stdio.h>

  int main() {

int array[100], maximum, size, c, location = 1;

  printf("Enter the number of elements in array\n");

scanf("%d", &size);

printf("Enter %d integers\n", size);

for (c = 0; c < size; c++)

scanf("%d", &array[c]);

maximum = array[0];

for (c = 1; c < size; c++) {

if (array[c] > maximum) {

maximum = array[c];

location = c+1;

}

}

printf("Maximum element is at location %d, it's value is %d.\n", location, maximum);

return 0;

}

(10 marks)

(C4: Analyze)

Q3 Use a big-O notation to estimate the recursive algorithm for computing m. x whenever m is a positive integer and x is an integer.

(10 marks)

(C4: Analyze)

Q4 Use a big-O notation to estimate the sum of the first n integer numbers in an algorithm.

(10 marks)

(C4: Analyze)

Q5 Find the big-O notation of the following code segment.

for (i=0; i<n; i++)

for (j=i+1; j<n; j++)

b[i][j]= a[i][j];

(10 marks)

(C4: Analyze)

Q6 Find the big-O notation of the following code segment.

for (i=1; i<n; i++)

for (j=1; j<3i; j++)

b[i][j]= a[i][j];

(10 marks)

(C4: Analyze)

Instructions:

1. Group assignment of 4 students

2. Follow your Author group

3. Submit before 09/05/2024

4. Submit to your group account @ Author UTHM