

## Digital Assignment – 1

### Data Structures Theory

**Submitted by: Hari Krishna Shah**

**VIT ID: 21BCS0167**

Ques 1. Write a program to find the second biggest of the given n numbers using an array with pointers.

Answer:

```
#include <stdio.h>
#include <malloc.h>
int second_max(int *array_head, int size);
int main(){
    int *array, n, max2;
    printf("Enter the number of elements to be inserted into the
array: ");
    scanf("%d", &n);
    array = (int *) (malloc(n*sizeof(int)));

    printf("Enter the array elements: ");
    for(int i = 0; i<n; i++){
        scanf("%d", &array[i]);
    }

    max2 = second_max(array, n);
    printf("The second largest number is %d.", max2);
}

int second_max(int *array_head, int size){
    int *ptr, max, second_max;
    ptr = array_head;
    max = *array_head;
    for(int i = 0; i<size; i++){
        if(max<*ptr){
            max = *ptr;
        }
        ptr += 1;
    }
}
```

```

ptr = array_head;

if(*array_head != max){
    second_max = *array_head;
}
else{
    second_max = *(array_head+1);
}
for(int i = 0; i<size; i++){
    if(second_max<*ptr && *ptr != max){
        second_max = *ptr;
    }
    ptr = ptr + 1;
}

return second_max;
}

```

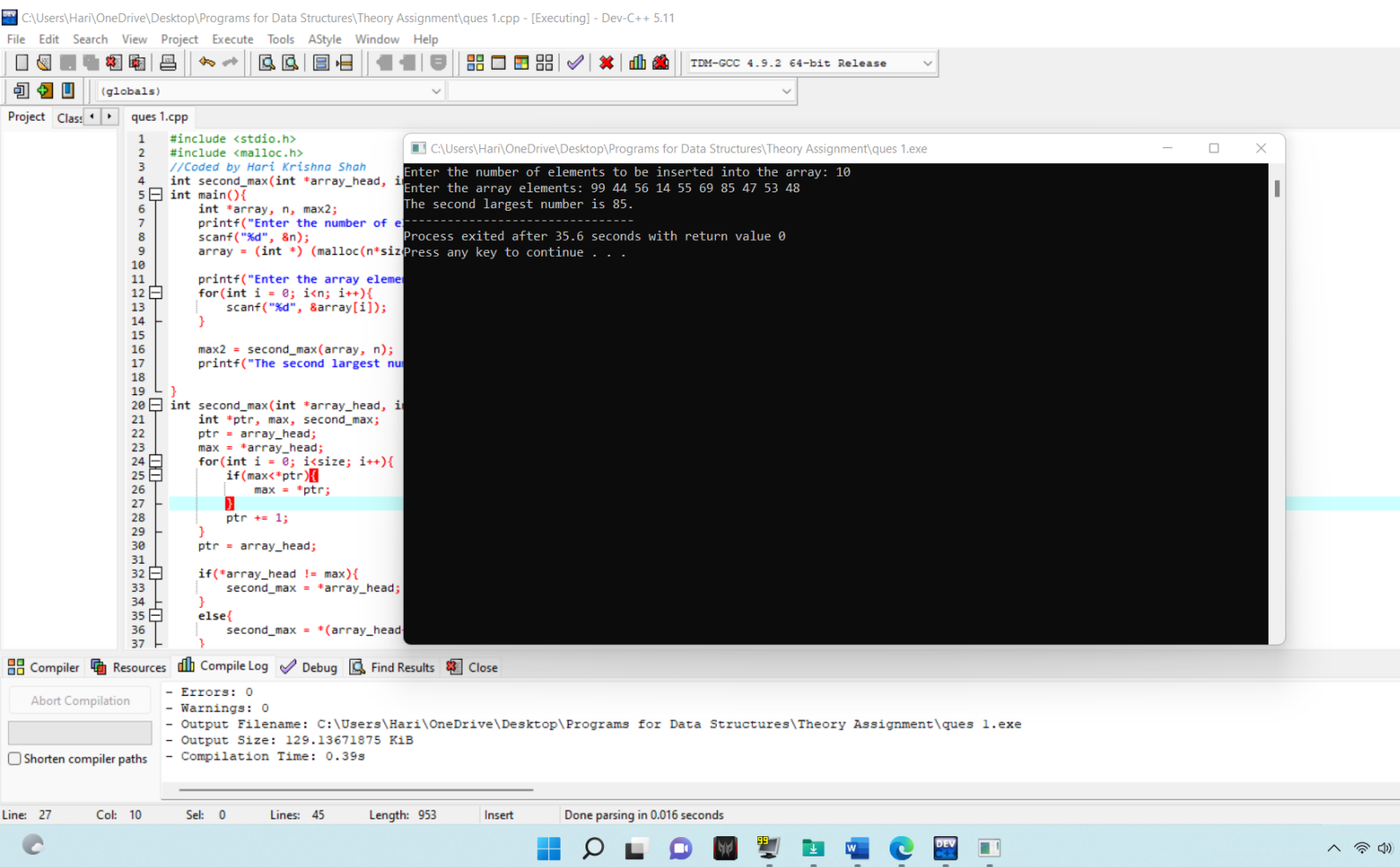
The screenshot shows a C++ IDE with the following code in 'ques1.cpp':

```

1 #include <stdio.h>
2 #include <malloc.h>
3 //Code by Hari Krishna Shah
4 int second_max(int *array_head, int size);
5 int main(){
6     int *array, n, max2;
7     printf("Enter the number of elements to be inserted into the array: ");
8     scanf("%d", &n);
9     array = (int *) (malloc(n*sizeof(int)));
10
11     printf("Enter the array elements: ");
12     for(int i = 0; i<n; i++){
13         scanf("%d", &array[i]);
14     }
15
16     max2 = second_max(array, n);
17     printf("The second largest number is %d.", max2);
18 }
19
20 int second_max(int *array_head, int size){
21     int *ptr, max, second_max;
22     ptr = array_head;
23     max = *array_head;
24     for(int i = 0; i<size; i++){
25         if(max<*ptr){
26             max = *ptr;
27         }
28         ptr ++ 1;
29     }
30     ptr = array_head;
31
32     if(*array_head != max){
33         second_max = *array_head;
34     }
35     else{
36         second_max = *(array_head+1);
37     }
38     for(int i = 0; i<size; i++){
39         if(second_max<*ptr && *ptr != max){
40             second_max = *ptr;
41         }
42         ptr = ptr + 1;
43     }
44     return second_max;
45 }

```

The IDE interface includes a menu bar (File, Edit, Search, View, Project, Execute, Tools, AStyle, Window, Help), a toolbar, and a status bar at the bottom showing 'Line: 26', 'Col: 24', 'Sel: 0', 'Lines: 45', 'Length: 953', and 'Done parsing in 0.062 seconds'.



**Ques 2.** Consider an array `MARKS[20][5]` which stores the marks obtained by 20 students in 5 subjects. Now write a program to (a) find the average marks obtained in each subject. (b) find the average marks obtained by every student. (c) find the number of students who have scored below 50 in their average. (d) display the scores obtained by every student

**Answer:**

```
#include <stdio.h>
```

```
//Coded by Hari Krishna Shah
```

```
int main(){
    int MARKS[20][5], average_for_student[20] = {0}, average_marks=
0, scored_below = 0;
    int subject_average[5]={0}, sum_for_student = 0,
sum_subject_average = 0, sum_marks = 0, total_for_student[20] = {0};
```

```

for(int i = 0; i<20; i++){
    printf("Enter the marks scored by student number %d in 5
subjects: ", i+1);
    for(int j = 0; j<5; j++){
        scanf("%d", &MARKS[i][j]);
    }
}

```

```

for(int i = 0; i<20; i++){
    for(int j = 0; j<5; j++){
        sum_for_student += MARKS[i][j];
    }
    total_for_student[i] = sum_for_student;
    average_for_student[i] = sum_for_student/5;
    sum_for_student = 0;
}

```

```

for(int i = 0; i<20; i++){
    for(int j = 0; j<5; j++){
        sum_marks += MARKS[i][j];
    }
    average_marks = sum_marks/100;
}
for(int j = 0; j<5; j++){
    for(int i = 0; i<20; i++){
        sum_subject_average += MARKS[i][j];
    }
    subject_average[j] = sum_subject_average/20;
    sum_subject_average = 0;
}

```

```

for(int i = 0; i<20; i++){
    if(average_for_student[i]<50){
        scored_below += 1;
    }
}

```

```

printf("\n");
for(int i = 0; i<5; i++){
    printf("The average marks scored in subject number %d

```

```

is: %d\n", i+1, subject_average[i]);
    }
    printf("\n");
    printf("The average score of the class per subject is %d.\n",
average_marks);
    printf("The number of student whose average is less than 50 is
%d.\n\n", scored_below);
    for(int i = 0; i<20; i++){
        printf("The marks scored by student number %d is given
below: \n", i+1);
        for(int j = 0; j<5; j++){
            printf("Marks for subject number %d is %d.\n", j+1,
MARKS[i][j]);
        }
        printf("The total marks scored by student number %d is
%d.\n", i+1, total_for_student[i]);
        printf("The average marks scored by student number %d
is %d.\n", i+1, average_for_student[i]);
        printf("\n");
    }

    return 0;
}

```

```

1  #include <stdio.h>
2  //Coded by Hari Krishna Shah
3
4  int main(){
5      int MARKS[20][5], average_for_student[20] = {0}, average_marks= 0, scored_below = 0;
6      int subject_average[5]={0}, sum_for_student = 0, sum_subject_average = 0, sum_marks = 0, total_for_student[20] = {0};
7
8      for(int i = 0; i<20; i++){
9          printf("Enter the marks scored by student number %d in 5 subjects: ", i+1);
10         for(int j = 0; j<5; j++){
11             scanf("%d", &MARKS[i][j]);
12         }
13     }
14
15     for(int i = 0; i<20; i++){
16         for(int j = 0; j<5; j++){
17             sum_for_student += MARKS[i][j];
18         }
19         total_for_student[i] = sum_for_student;
20         average_for_student[i] = sum_for_student/5;
21         sum_for_student = 0;
22     }
23     for(int i = 0; i<20; i++){
24         for(int j = 0; j<5; j++){
25             sum_marks += MARKS[i][j];
26         }
27         average_marks = sum_marks/100;
28     }
29     for(int i = 0; i<20; i++){
30         printf("The marks scored by student number %d is given below: \n", i+1);
31         for(int j = 0; j<5; j++){
32             printf("Marks for subject number %d is %d.\n", j+1, MARKS[i][j]);
33         }
34         printf("The total marks scored by student number %d is %d.\n", i+1, total_for_student[i]);
35         printf("The average marks scored by student number %d is %d.\n", i+1, average_for_student[i]);
36         printf("\n");
37     }
38
39     return 0;
40 }

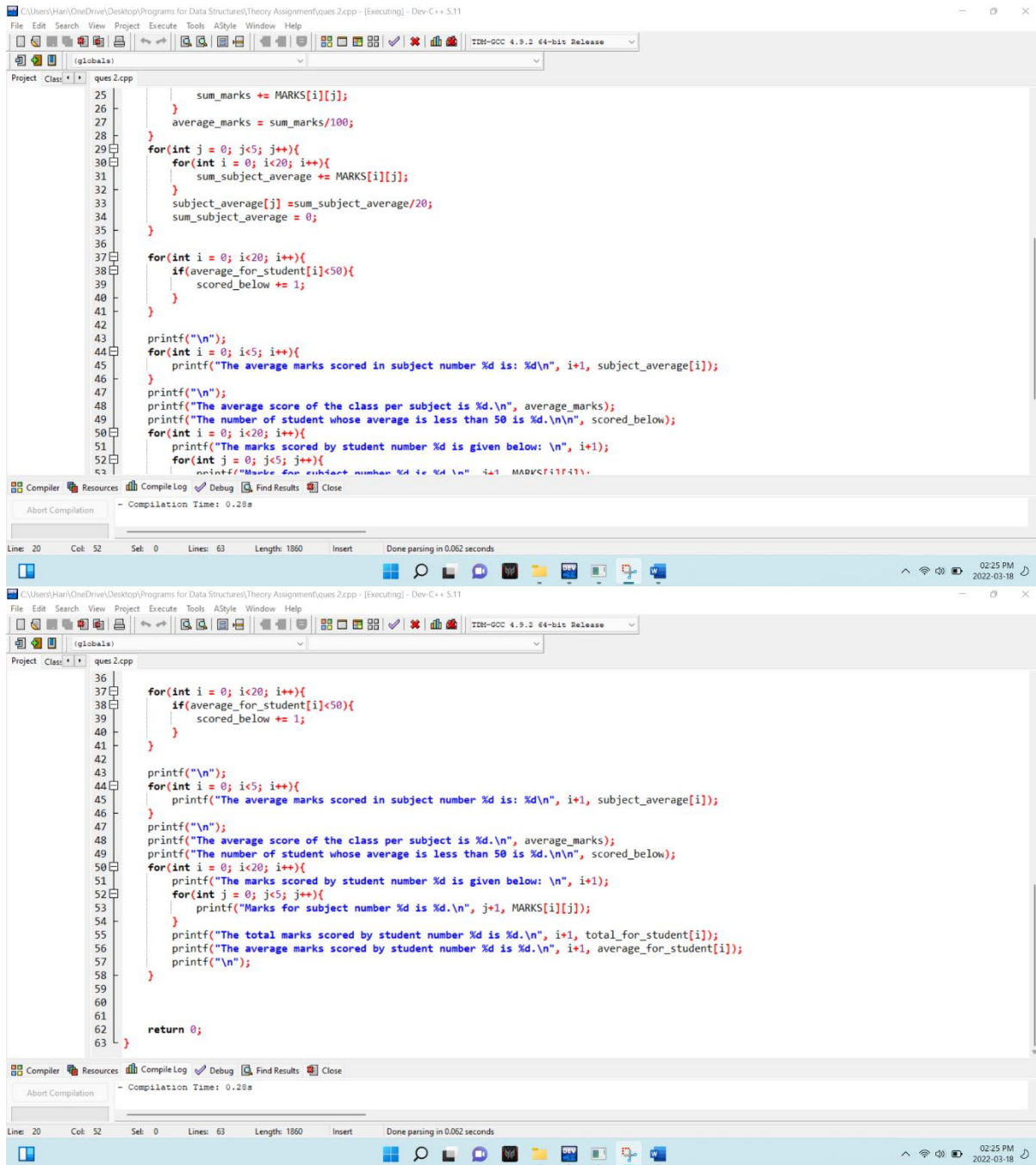
```

Compiler Resources Compile Log Debug Find Results Close

Compilation Time: 0.28s

Line: 20 Col: 52 Set: 0 Lines: 63 Length: 1860 Insert Done parsing in 0.062 seconds

02:24 PM 2022-03-18



```
Select C:\Users\Hani\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 2.exe

Enter the marks scored by student number 1 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 2 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 3 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 4 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 5 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 6 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 7 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 8 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 9 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 10 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 11 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 12 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 13 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 14 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 15 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 16 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 17 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 18 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 19 in 5 subjects: 1 2 3 4 5
Enter the marks scored by student number 20 in 5 subjects: 1 2 3 4 5

The average marks scored in subject number 1 is: 1
The average marks scored in subject number 2 is: 2
The average marks scored in subject number 3 is: 3
The average marks scored in subject number 4 is: 4
The average marks scored in subject number 5 is: 5

The average score of the class per subject is 3.
The number of student whose average is less than 50 is 20.

The marks scored by student number 1 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 1 is 15.
The average marks scored by student number 1 is 3.

The marks scored by student number 2 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 2 is 15.
The average marks scored by student number 2 is 3.

The marks scored by student number 3 is given below:
```

```
Select C:\Users\Hani\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 2.exe

The marks scored by student number 3 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 3 is 15.
The average marks scored by student number 3 is 3.

The marks scored by student number 4 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 4 is 15.
The average marks scored by student number 4 is 3.

The marks scored by student number 5 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 5 is 15.
The average marks scored by student number 5 is 3.

The marks scored by student number 6 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 6 is 15.
The average marks scored by student number 6 is 3.

The marks scored by student number 7 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 7 is 15.
The average marks scored by student number 7 is 3.

The marks scored by student number 8 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
```

Select C:\Users\Hani\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 2.exe

The marks scored by student number 8 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 8 is 15.  
The average marks scored by student number 8 is 3.

The marks scored by student number 9 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 9 is 15.  
The average marks scored by student number 9 is 3.

The marks scored by student number 10 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 10 is 15.  
The average marks scored by student number 10 is 3.

The marks scored by student number 11 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 11 is 15.  
The average marks scored by student number 11 is 3.

The marks scored by student number 12 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 12 is 15.  
The average marks scored by student number 12 is 3.

The marks scored by student number 13 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.

Select C:\Users\Hani\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 2.exe

Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 17 is 15.  
The average marks scored by student number 17 is 3.

The marks scored by student number 18 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 18 is 15.  
The average marks scored by student number 18 is 3.

The marks scored by student number 19 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 19 is 15.  
The average marks scored by student number 19 is 3.

The marks scored by student number 20 is given below:  
Marks for subject number 1 is 1.  
Marks for subject number 2 is 2.  
Marks for subject number 3 is 3.  
Marks for subject number 4 is 4.  
Marks for subject number 5 is 5.  
The total marks scored by student number 20 is 15.  
The average marks scored by student number 20 is 3.

-----  
Process exited after 16.41 seconds with return value 0  
Press any key to continue . . .



```
Select C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 2.exe
The marks scored by student number 13 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 13 is 15.
The average marks scored by student number 13 is 3.

The marks scored by student number 14 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 14 is 15.
The average marks scored by student number 14 is 3.

The marks scored by student number 15 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 15 is 15.
The average marks scored by student number 15 is 3.

The marks scored by student number 16 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 16 is 15.
The average marks scored by student number 16 is 3.

The marks scored by student number 17 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
Marks for subject number 4 is 4.
Marks for subject number 5 is 5.
The total marks scored by student number 17 is 15.
The average marks scored by student number 17 is 3.

The marks scored by student number 18 is given below:
Marks for subject number 1 is 1.
Marks for subject number 2 is 2.
Marks for subject number 3 is 3.
```

Ques 3. Write a program that reads an array of 100 integers. Display all the pairs of elements whose sum is 50.

Answer:

```
#include <stdio.h>
```

```
#include <malloc.h>
```

```
//Coded by Hari Krishna Shah
```

```
int main0{
    int size, *array, check;
    printf("Enter the number of elements to be stored in the array: ");
    scanf("%d", &size);
    array = (int *) (malloc(size*sizeof(int)));

    printf("Enter the array elements: ");
    for(int i = 0; i<size; i++){
        scanf("%d", &array[i]);
    }

    for(int i = 0; i<size; i++){
        for(int j = i+1; j<size; j++){
            if(array[i]+ array[j] == 50){
                printf("The number %d and %d which is at
index %d and %d make a pair of exact 50.\n", array[i], array[j], i, j);
                check = 1;
            }
        }
    }
}
```

```

    }
}

if(check == 0){
    printf("The are no paris of elements in the array whose sum
is 50.\n");
}

return 0;
}

```

The screenshot shows a C++ IDE window titled "C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 3.cpp - [Executing] - Dev-C++ 5.11". The code in the editor is as follows:

```

1  #include <stdio.h>
2  #include <malloc.h>
3  //Coded by Hari Krishna Shah
4
5  int main(){
6      int size, *array, check;
7      printf("Enter the number of elements to be stored in the array: ");
8      scanf("%d", &size);
9      array = (int *) (malloc(size*sizeof(int)));
10     printf("Enter the array elements: ");
11     for(int i = 0; i<size; i++){
12         scanf("%d", &array[i]);
13     }
14
15     for(int i = 0; i<size; i++){
16         for(int j = i+1; j<size; j++){
17             if(array[i]+array[j] == 50){
18                 printf("The number %d and %d which is at index %d and %d make a pair of exact 50.\n", array[i], array[j], i, j);
19                 check = 1;
20             }
21         }
22     }
23
24     if(check == 0){
25         printf("The are no paris of elements in the array whose sum is 50.\n");
26     }
27     return 0;
28 }

```

The IDE's Compiler window shows the following output:

```

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 3.exe
- Output Size: 128.7705078125 KiB
- Compilation Time: 0.24s

```

The status bar at the bottom indicates "Line: 23 Col: 5 Sel: 0 Lines: 28 Length: 719 Insert Done parsing in 0.015 seconds". The system tray shows the time as 02:22 PM on 2022-03-13.

```

Enter the number of elements to be stored in the array: 10
Enter the array elements: 40 20 10 30 50 65 0 18 8 9
The number 40 and 10 which is at index 0 and 2 make a pair of exact 50.
The number 20 and 30 which is at index 1 and 3 make a pair of exact 50.
The number 50 and 0 which is at index 4 and 6 make a pair of exact 50.

-----
Process exited after 32.84 seconds with return value 0
Press any key to continue . . .

```

**Ques 4 .** Define a structure to store the name, an array marks[] which stores the marks of three different subjects, and a character grade. Write a program to display the details of the student whose name is entered by the user. Use the structure definition of the first question to make an array of students. Display the name of the students who have secured less than 40% of the aggregate.

**Answer:**

```

#include <stdio.h>
#include <string.h>
//coded by Hari Krishna Shah
struct student{
    char name[100];
    int marks[3];
    char grade[3];
    float aggregate;
};
void display(struct student temp);
int main0{
    int size, temp1 = 0, temp2 = 0 ,count = 0, count2 = 1;
    char search[100];
    printf("Enter the number of students: ");
    scanf("%d", &size);

```

```

struct student s[size];

for(int i = 0; i<size; i++){
    printf("Enter the details of student number %d below.\n", i+1);
    printf("Enter the name of student: ");
    scanf("%s", &s[i].name);
    printf("Enter the marks obtained in 3 subjects: ");
    for(int j = 0; j<3; j++){
        scanf("%d", &s[i].marks[j]);
    }
    printf("\n");
}
for(int j = 0; j<size; j++){
    for(int i = 0; i<3; i++){
        temp1 += s[j].marks[i];
    }
    temp2 = temp1/3;
    s[j].aggregate = temp2;
    if(temp2 >90){
        strcpy(s[j].grade, "A+");
    }
    else if(temp2 >80){
        strcpy(s[j].grade, "A");
    }
    else if(temp2 >70){
        strcpy(s[j].grade, "B+");
    }
    else if(temp2 >60){
        strcpy(s[j].grade, "B");
    }
    else if(temp2 >50){
        strcpy(s[j].grade, "C+");
    }
    else if(temp2 >40){
        strcpy(s[j].grade, "C");
    }
    else{
        strcpy(s[j].grade, "C");
        count += 1;
    }
    temp1 = 0;
}

if(count == 0){
    printf("There is no one in the class whose aggregate is below
40.\n\n");
}
else{
    printf("This are the students whose aggregate is less than 40.\n");
    for(int i = 0; i<size; i++){
        if(s[i].aggregate<40){
            printf("%d. %s\n", count2, s[i].name);
            count2 += 1;
        }
    }
}

```

```

    }
}
printf("\n");
}

printf("Enter the name of student to search: ");
scanf("%s", &search);
for(int i = 0; i < size; i++){
    if(strcmp(s[i].name, search) == 0){
        display(s[i]);
    }
}

}

void display(struct student temp){
    printf("The details of the student is given below.\n");
    printf("Name: %s\n", temp.name);
    for(int j = 0; j < 3; j++){
        printf("Marks for subject number %d: %d\n", j+1,
temp.marks[j]);
    }
    printf("Grade: %s\n", temp.grade);
    printf("Aggregate: %.0f%%.\n", temp.aggregate);
}

```

```
C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 4.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Class
[*] ques 4.cpp
1 #include <stdio.h>
2 #include <string.h>
3 //coded by Hari Krishna Shah
4 struct student{
5     char name[100];
6     int marks[3];
7     char grade[3];
8     float aggregate;
9 };
10 void display(struct student temp);
11 int main(){
12     int size, temp1 = 0, temp2 = 0, count = 0, count2 = 1;
13     char search[100];
14     printf("Enter the number of students: ");
15     scanf("%d", &size);
16
17     struct student s[size];
18
19     for(int i = 0; i < size; i++){
20         printf("Enter the details of student number %d below.\n", i+1);
21         printf("Enter the name of student: ");
22         scanf("%s", &s[i].name);
23         printf("Enter the marks obtained in 3 subjects: ");
24         for(int j = 0; j < 3; j++){
25             scanf("%d", &s[i].marks[j]);
26         }
27         printf("\n");
28     }
29     for(int j = 0; j < size; j++){
30         for(int i = 0; i < 3; i++){
31             temp1 += s[j].marks[i];
32         }
33         temp2 = temp1/3;
34         s[j].aggregate = temp2;
35         if(temp2 > 90){
36             strcpy(s[j].grade, "A+");
37         }
38         else if(temp2 > 80){
39             strcpy(s[j].grade, "A");
40         }
41         else if(temp2 > 70){
42             strcpy(s[j].grade, "B+");
43         }
44         else if(temp2 > 60){
45             strcpy(s[j].grade, "B");
46         }
47         else if(temp2 > 50){
48             strcpy(s[j].grade, "C+");
49         }
50         else if(temp2 > 40){
51             strcpy(s[j].grade, "C");
52         }
53         else{
54             strcpy(s[j].grade, "C");
55             count += 1;
56         }
57         temp1 = 0;
58     }
59
60     if(count == 0){
61         printf("There is no one in the class whose aggregate is below 40.\n\n");
62     }
63     else{
64         printf("This are the students whose aggregate is less than 40.\n");
65         for(int i = 0; i < size; i++){
66             if(s[i].aggregate < 40){
67                 printf("%d. %s\n", count2, s[i].name);
68                 count2 += 1;
69             }
70         }
71     }
72 }
```

```
C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 4.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Class
[*] ques 4.cpp
35     if(temp2 > 90){
36         strcpy(s[j].grade, "A+");
37     }
38     else if(temp2 > 80){
39         strcpy(s[j].grade, "A");
40     }
41     else if(temp2 > 70){
42         strcpy(s[j].grade, "B+");
43     }
44     else if(temp2 > 60){
45         strcpy(s[j].grade, "B");
46     }
47     else if(temp2 > 50){
48         strcpy(s[j].grade, "C+");
49     }
50     else if(temp2 > 40){
51         strcpy(s[j].grade, "C");
52     }
53     else{
54         strcpy(s[j].grade, "C");
55         count += 1;
56     }
57     temp1 = 0;
58 }
59
60 if(count == 0){
61     printf("There is no one in the class whose aggregate is below 40.\n\n");
62 }
63 else{
64     printf("This are the students whose aggregate is less than 40.\n");
65     for(int i = 0; i < size; i++){
66         if(s[i].aggregate < 40){
67             printf("%d. %s\n", count2, s[i].name);
68             count2 += 1;
69         }
70     }
71 }
```

```

C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 4.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Class [*] ques 4.cpp
60 if(count == 0){
61     printf("There is no one in the class whose aggregate is below 40.\n\n");
62 }
63 else{
64     printf("This are the students whose aggregate is less than 40.\n");
65     for(int i = 0; i < size; i++){
66         if(s[i].aggregate < 40){
67             printf("%d. %s\n", count2, s[i].name);
68             count2 += 1;
69         }
70     }
71     printf("\n");
72 }
73
74
75 printf("Enter the name of student to search: ");
76 scanf("%s", &search);
77 for(int i = 0; i < size; i++){
78     if(strcmp(s[i].name, search) == 0){
79         display(s[i]);
80     }
81 }
82
83
84 }
85
86 void display(struct student temp){
87     printf("The details of the student is given below.\n");
88     printf("Name: %s\n", temp.name);
89     for(int j = 0; j < 3; j++){
90         printf("Marks for subject number %d: %d\n", j+1, temp.marks[j]);
91     }
92     printf("Grade: %s\n", temp.grade);
93     printf("Aggregate: %.0f%%\n", temp.aggregate);
94 }

```

Compiler Resources Compile Log Debug Find Results  
 Line: 23 Col: 60 Set: 0 Lines: 94 Length: 2119 Insert Done parsing in 0.078 seconds  
 02:28 PM 2022-03-13

C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 4.exe

```

Enter the number of students: 2
Enter the details of student number 1 below.
Enter the name of student: Hari
Enter the marks obtained in 3 subjects: 45 65 85

Enter the details of student number 2 below.
Enter the name of student: John
Enter the marks obtained in 3 subjects: 15 20 35

This are the students whose aggregate is less than 40.
1. John

Enter the name of student to search: Hari
The details of the student is given below.
Name: Hari
Marks for subject number 1: 45
Marks for subject number 2: 65
Marks for subject number 3: 85
Grade: B
Aggregate: 65%.

-----
Process exited after 28.04 seconds with return value 0
Press any key to continue . . .

```

**Ques 5.** Write a program to create a structure with the information given below. Then, read and print the data. Use the pointer objects. Employee[10] (a) Emp\_Id (b) Name (i) First Name (ii) Middle Name (iii) Last Name (c) Address (i) Area (ii) City (iii) State (d) Age (e) Salary (f) Designation.

Answer:

```
#include <stdio.h>
#include <string.h>
#include <malloc.h>
//Coded by Hari Krishna Shah
struct Employee_details{
    char EMP_Id[20];
    struct Name{
        char first_name[30];
        char middle_name[30];
        char last_name[30];
    }name;
    struct Address{
        char area[30];
        char city[30];
        char state[30];
    }address;
    int age;
    int salary;
    char designation[30];
};

int main0{
    struct Employee_details *Employee;
    Employee = (struct Employee_details *) (malloc(10 * sizeof(struct
Employee_details)));

    for(int i= 0; i<10; i++){
        printf("Enter the details of employee number %d below.\n", i+1);
        printf("Enter the name of the employee below.\n");
        printf("Enter the first name: ");
        scanf("%s", &Employee[i].name.first_name);
        printf("Enter the middle name: ");
        scanf("%s", &Employee[i].name.middle_name);
        printf("Enter the last name: ");
        scanf("%s", &Employee[i].name.last_name);
        printf("Enter the area: ");
        scanf("%s", &Employee[i].address.area);
        printf("Enter the city: ");
        scanf("%s", &Employee[i].address.city);
        printf("Enter the state: ");
        scanf("%s", &Employee[i].address.state);
        printf("Enter the age: ");
        scanf("%d", &Employee[i].age);
        printf("Enter the salary: ");
        scanf("%d", &Employee[i].salary);
        printf("Enter the designation: ");
        scanf("%s", &Employee[i].designation);
        printf("\n");
    }

    for(int i= 0; i<10; i++){
        printf("The details of employee number %d below.\n", i+1);
```

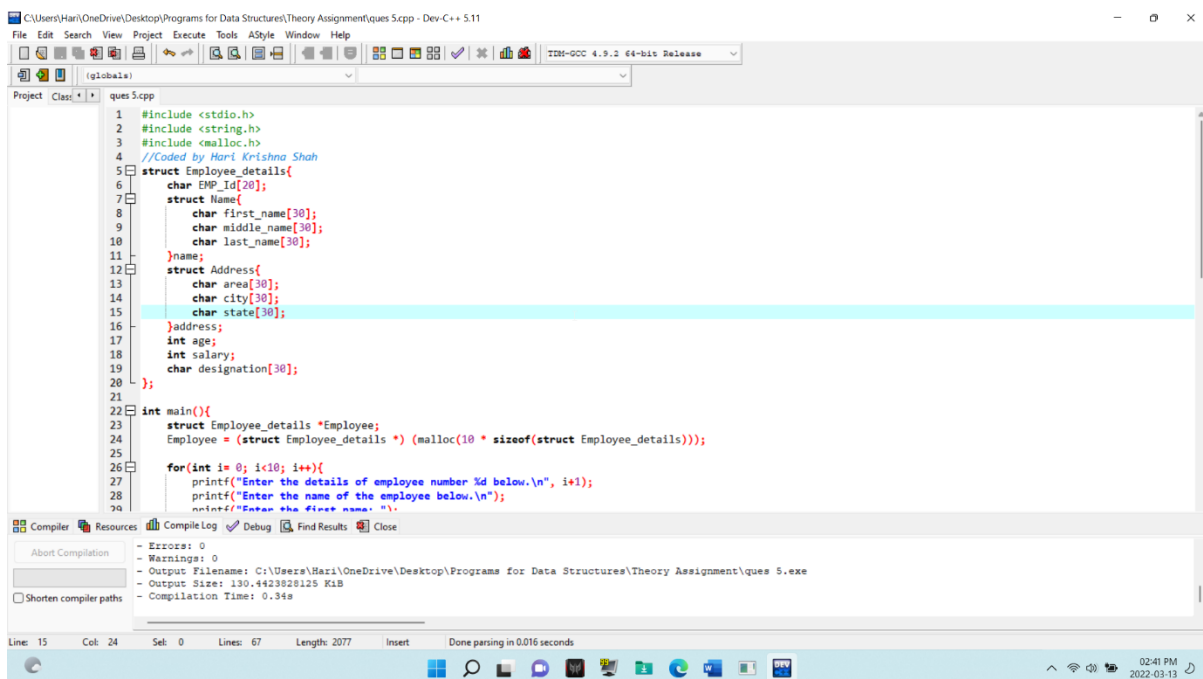


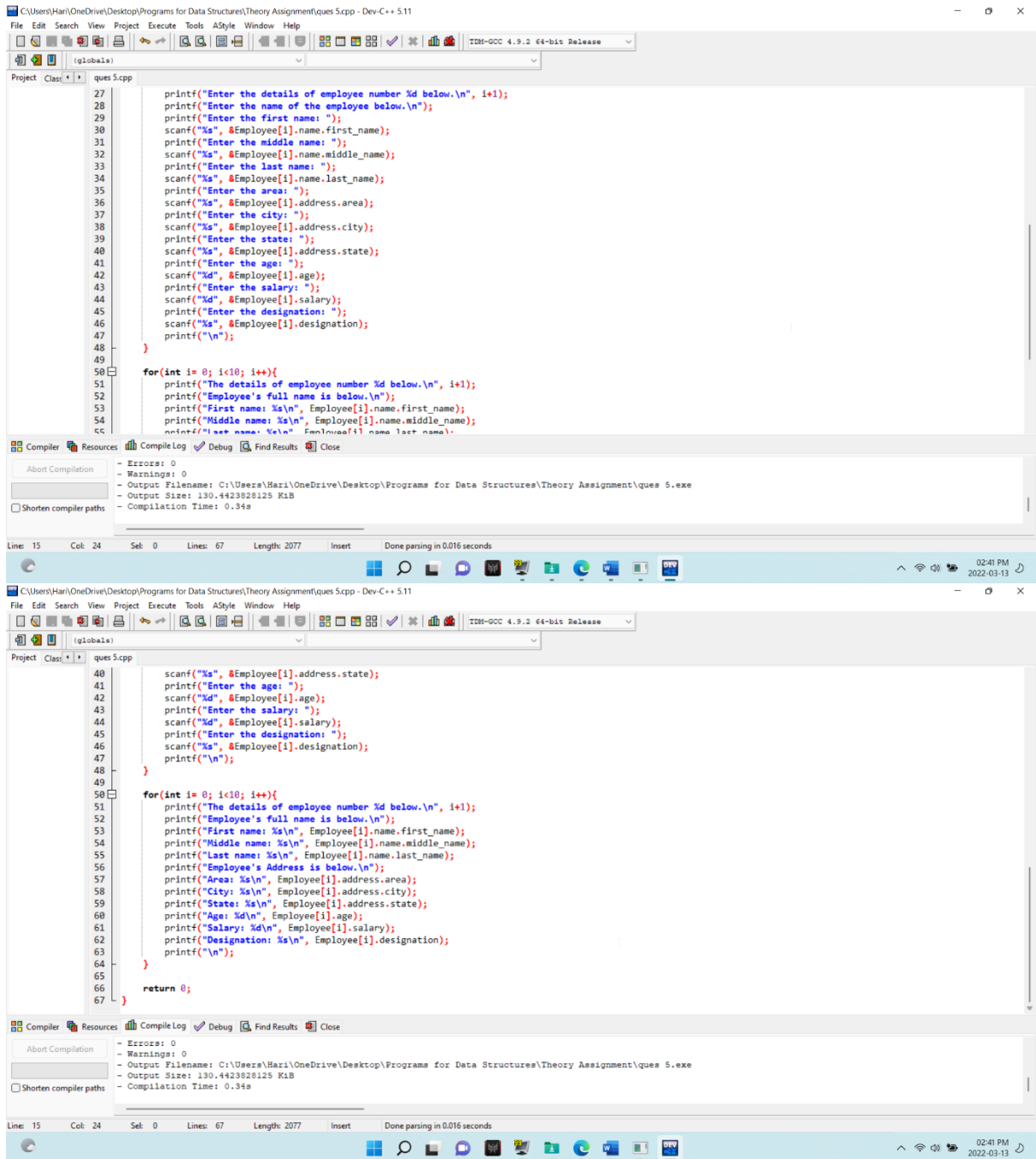
```

        printf("Employee's full name is below.\n");
        printf("First name: %s\n", Employee[i].name.first_name);
        printf("Middle name: %s\n", Employee[i].name.middle_name);
        printf("Last name: %s\n", Employee[i].name.last_name);
        printf("Employee's Address is below.\n");
        printf("Area: %s\n", Employee[i].address.area);
        printf("City: %s\n", Employee[i].address.city);
        printf("State: %s\n", Employee[i].address.state);
        printf("Age: %d\n", Employee[i].age);
        printf("Salary: %d\n", Employee[i].salary);
        printf("Designation: %s\n", Employee[i].designation);
        printf("\n");
    }

    return 0;
}

```





C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Theory Assignment\ques 5.exe

Enter the details of employee number 1 below.  
Enter the name of the employee below.  
Enter the first name: Hari  
Enter the middle name: Krishna  
Enter the last name: Shah  
Enter the area: Madhutar  
Enter the city: Sindhuli  
Enter the state: Bagmati  
Enter the age: 20  
Enter the salary: 15000  
Enter the designation: Student

Enter the details of employee number 2 below.  
Enter the name of the employee below.  
Enter the first name: Aadesh  
Enter the middle name: Jung  
Enter the last name: Koirala  
Enter the area: Vellore  
Enter the city: Tofu  
Enter the state: Tamilnadu  
Enter the age: 21  
Enter the salary: 0  
Enter the designation: Halvaldar

The details of employee number 1 below.  
Employee's full name is below.  
First name: Hari  
Middle name: Krishna  
Last name: Shah  
Employee's Address is below.  
Area: Madhutar  
City: Sindhuli  
State: Bagmati  
Age: 20  
Salary: 15000  
Designation: Student

The details of employee number 2 below.  
Employee's full name is below.  
First name: Aadesh  
Middle name: Jung  
Last name: Koirala  
Employee's Address is below.  
Area: Vellore  
City: Tofu  
State: Tamilnadu  
Age: 21  
Salary: 0  
Designation: Halvaldar



02:39 PM  
2022-03-13