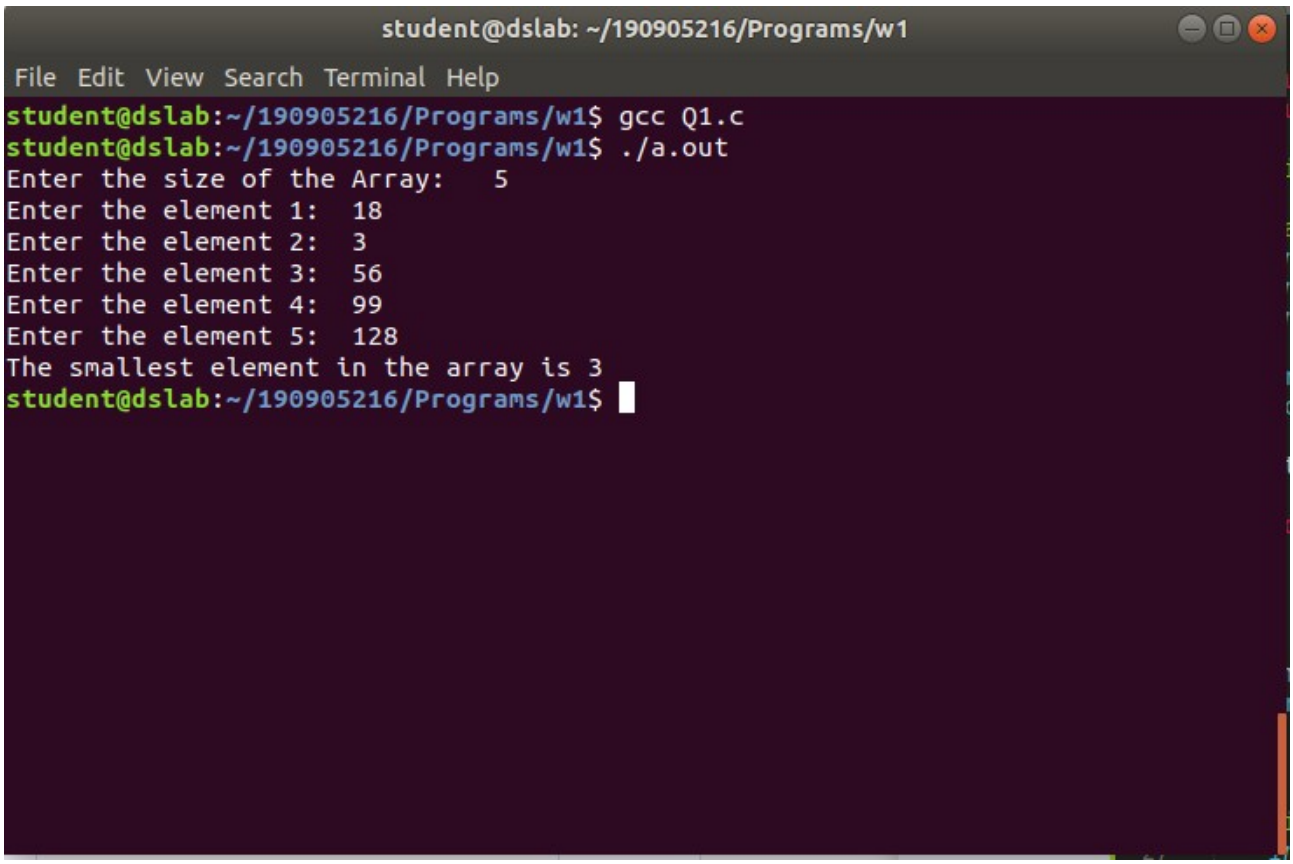
Week 1

Q1.

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

int findSmallestElement(int * ,int);

int main(){
	int size;
	int * ptr;
	int i, smallest;

	printf("Enter the size of the Array:   ");
	scanf("%d", &size);

	ptr = (int *)calloc(size, sizeof(int));

	for(i=0; i<size; i++){
		printf("Enter the element %d:  ", i+1);
		scanf("%d", ptr+i);
	}

	smallest =findSmallestElement(ptr, size);
	printf("The smallest element in the array is %d\n", smallest);

}

int findSmallestElement(int * ptr, int size){
	int i;
	int smallest;

	smallest= *ptr;
	for(i=1; i<size; i++){
		if( *(ptr+i) < smallest ){
			smallest =*(ptr+i);
		}
	}

	return smallest;
}
```

Output of Q1:

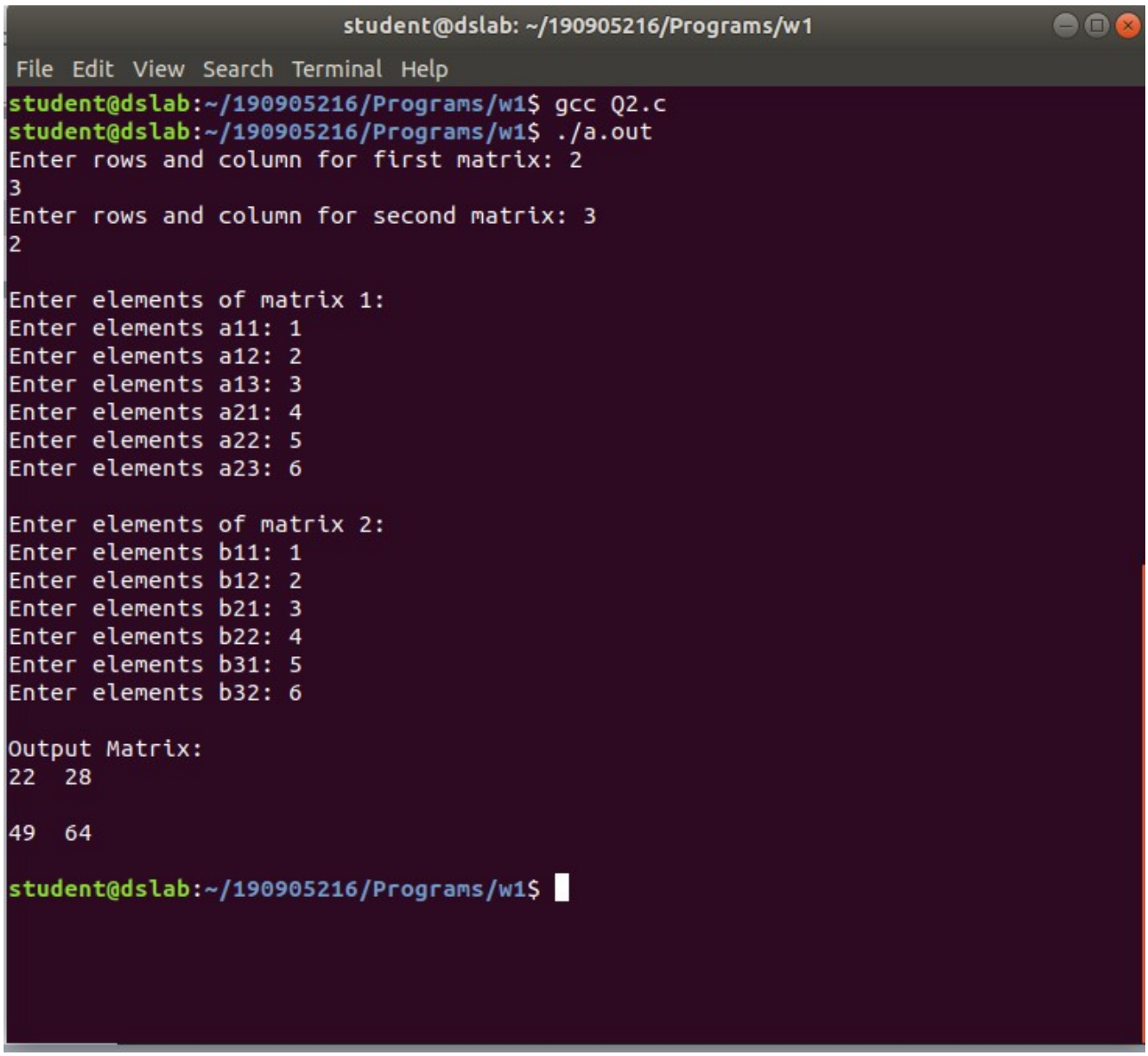

student@dslab: ~/190905216/Programs/w1
File Edit View Search Terminal Help
student@dslab:~/190905216/Programs/w1$ gcc Q1.c
student@dslab:~/190905216/Programs/w1$ ./a.out
Enter the size of the Array: 5
Enter the element 1: 18
Enter the element 2: 3
Enter the element 3: 56
Enter the element 4: 99
Enter the element 5: 128
The smallest element in the array is 3
student@dslab:~/190905216/Programs/w1$

Question 2:

```
#include <stdio.h>

void enterData(int firstMatrix[][10], int secondMatrix[][10], int rowFirst, int
columnFirst, int rowSecond, int columnSecond)
{
	int i, j;
	printf("\nEnter elements of matrix 1:\n");
	for(i = 0; i < rowFirst; ++i){
		for(j = 0; j < columnFirst; ++j){
			printf("Enter elements a%d%d: ", i + 1, j + 1);
			scanf("%d", &firstMatrix[i][j]);
		}
	}

	printf("\nEnter elements of matrix 2:\n");
	for(i = 0; i < rowSecond; ++i){
		for(j = 0; j < columnSecond; ++j){
			printf("Enter elements b%d%d: ", i + 1, j + 1);
			scanf("%d", &secondMatrix[i][j]);
		}
	}
}


void multiplyMatrices(int firstMatrix[][10], int secondMatrix[][10], int mult[]
[10], int rowFirst, int columnFirst, int rowSecond, int columnSecond){
	int i, j, k;

	for(i = 0; i < rowFirst; ++i){
		for(j = 0; j < columnSecond; ++j){
			mult[i][j] = 0;
		}
	}


	for(i = 0; i < rowFirst; ++i){
		for(j = 0; j < columnSecond; ++j){
			for(k=0; k<columnFirst; ++k){
				mult[i][j] += firstMatrix[i][k] * secondMatrix[k][j];
			}
```

```
            }
        }
}

void display(int mult[][10], int rowFirst, int columnSecond){
        int i, j;
        printf("\nOutput Matrix:\n");
        for(i = 0; i < rowFirst; ++i){
                for(j = 0; j < columnSecond; ++j){
                        printf("%d  ", mult[i][j]);
                        if(j == columnSecond - 1)
                                printf("\n\n");
                }
        }
}


int main() {
        int firstMatrix[10][10], secondMatrix[10][10], mult[10][10], rowFirst,
columnFirst, rowSecond, columnSecond, i, j, k;

        printf("Enter rows and column for first matrix: ");
        scanf("%d %d", &rowFirst, &columnFirst);

        printf("Enter rows and column for second matrix: ");
        scanf("%d %d", &rowSecond, &columnSecond);

        while (columnFirst != rowSecond){
                printf("Error! column of first matrix not equal to row of second.\n");
                printf("Cant Proceed ");
                return 0;
        }

       enterData(firstMatrix, secondMatrix, rowFirst, columnFirst, rowSecond,
columnSecond);
       multiplyMatrices(firstMatrix, secondMatrix, mult, rowFirst, columnFirst,
rowSecond, columnSecond);
       display(mult, rowFirst, columnSecond);
        return 0;
}
```

Output:

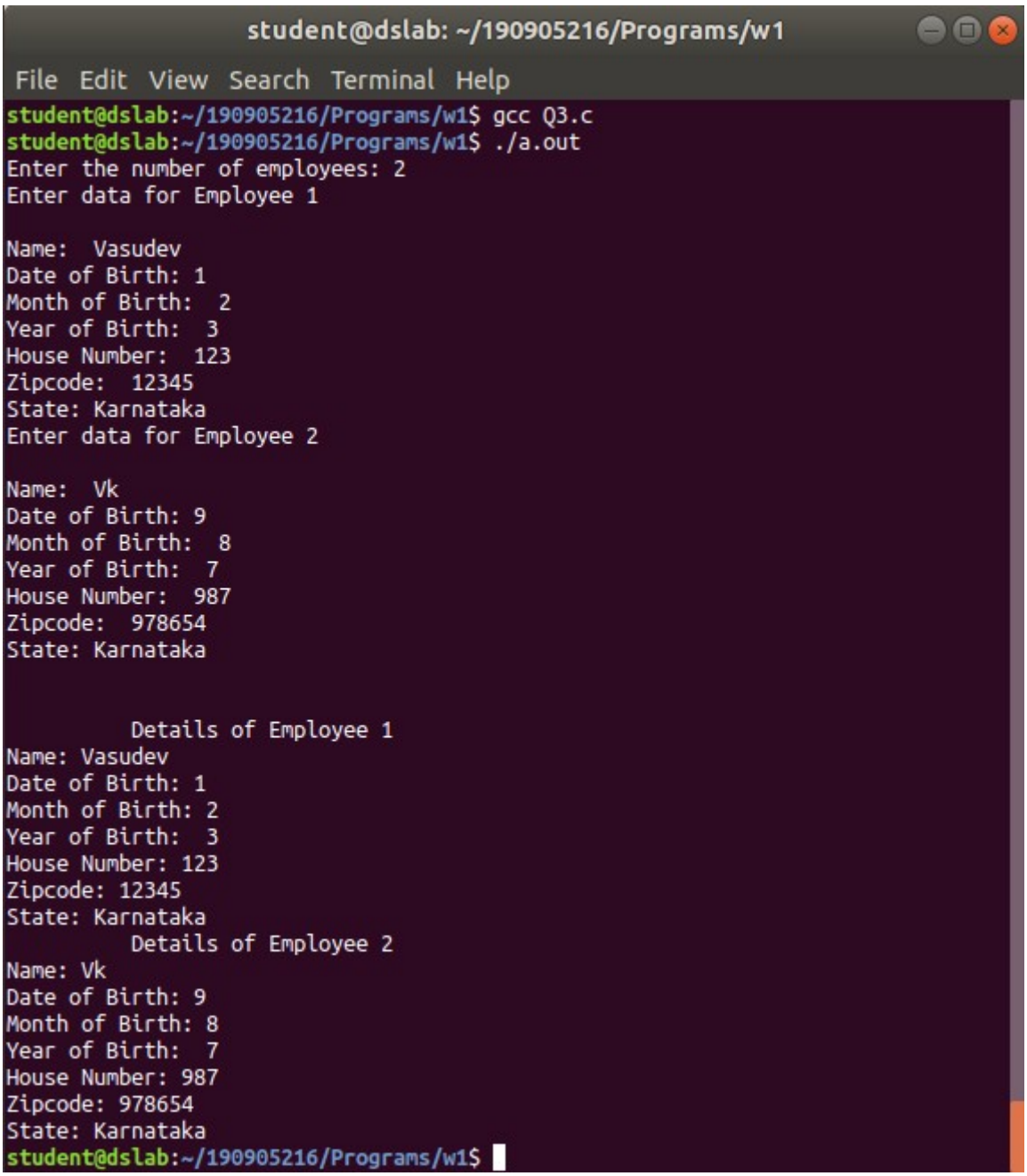

student@dslab: ~/190905216/Programs/w1
File Edit View Search Terminal Help
student@dslab:~/190905216/Programs/w1$ gcc Q2.c
student@dslab:~/190905216/Programs/w1$ ./a.out
Enter rows and column for first matrix: 2
3
Enter rows and column for second matrix: 3
2
Enter elements of matrix 1:
Enter elements a11: 1
Enter elements a12: 2
Enter elements a13: 3
Enter elements a21: 4
Enter elements a22: 5
Enter elements a23: 6
Enter elements of matrix 2:
Enter elements b11: 1
Enter elements b12: 2
Enter elements b21: 3
Enter elements b22: 4
Enter elements b31: 5
Enter elements b32: 6
Output Matrix:
22 28
49 64
student@dslab:~/190905216/Programs/w1$

Question 3:

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

int main(){

	struct DOB {
		int day, month, year;
	};

	struct ADRS {
		int house_no;
		long zipcode;
		char state[20];
	};

	struct EMPLOYEE {
		char name[20];
		struct DOB dob;
		struct ADRS address;
	};

	struct EMPLOYEE emp[10];
	struct EMPLOYEE * ptr;

	int num,i;

	printf("Enter the number of employees: ");
	scanf("%d",&num);

	for(int i=0;i<num; i++){

		ptr=emp+i;

		printf("Enter data for Employee %d\n\n",i+1);
		printf("Name:  ");
		scanf("%s", ptr->name);
		printf("Date of Birth: ");
		scanf("%d", &(ptr->dob.day));
		printf("Month of Birth:  ");
		scanf("%d", &(ptr->dob.month));
```

```
            printf("Year of Birth:  ");
            scanf("%d", &(ptr->dob.year));
            printf("House Number:  ");
            scanf("%d", &(ptr->address.house_no));
            printf("Zipcode:  ");
            scanf("%ld", &(ptr->address.zipcode));
            printf("State: ");
            scanf("%s", ptr->address.state);
        }

        printf("\n\n");

        for(int i=0;i<num; i++){

            ptr=emp+i;

            printf("         Details of Employee %d\n",i+1);

            printf("Name: %s", ptr->name);
            printf("\nDate of Birth: %d", ptr->dob.day);
            printf("\nMonth of Birth: %d", ptr->dob.month);
            printf("\nYear of Birth:  %d", ptr->dob.year);
            printf("\nHouse Number: %d", ptr->address.house_no);
            printf("\nZipcode: %ld", ptr->address.zipcode);
            printf("\nState: %s", ptr->address.state);

            printf("\n");
        }
}
```

Output:


student@dslab: ~/190905216/Programs/w1
File Edit View Search Terminal Help
student@dslab:~/190905216/Programs/w1$ gcc Q3.c
student@dslab:~/190905216/Programs/w1$ ./a.out
Enter the number of employees: 2
Enter data for Employee 1
Name: Vasudev
Date of Birth: 1
Month of Birth: 2
Year of Birth: 3
House Number: 123
Zipcode: 12345
State: Karnataka
Enter data for Employee 2
Name: Vk
Date of Birth: 9
Month of Birth: 8
Year of Birth: 7
House Number: 987
Zipcode: 978654
State: Karnataka
Details of Employee 1
Name: Vasudev
Date of Birth: 1
Month of Birth: 2
Year of Birth: 3
House Number: 123
Zipcode: 12345
State: Karnataka
Details of Employee 2
Name: Vk
Date of Birth: 9
Month of Birth: 8
Year of Birth: 7
House Number: 987
Zipcode: 978654
State: Karnataka
student@dslab:~/190905216/Programs/w1$