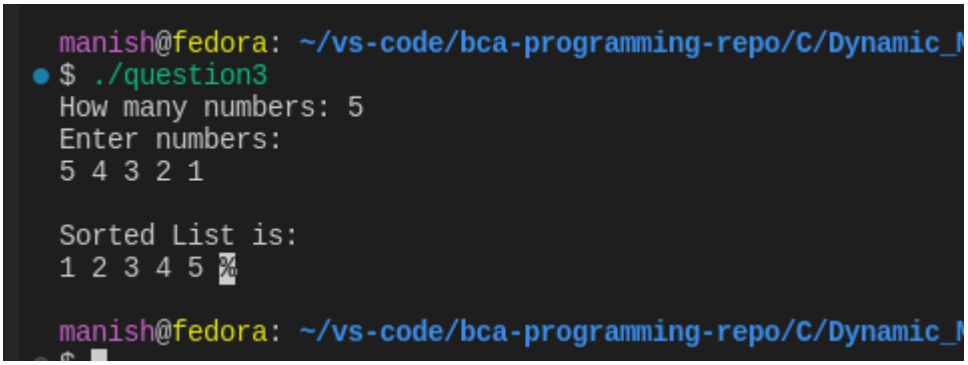
```c
/*Program to read an array of integers using dynamic memory allocation and display
the maximum and minimum value.*/
#include <stdio.h>
#include <stdlib.h>

// Function to find and display the minimum and maximum values in an array
void minmax(int *ptr, int n);

int main()
{
    int n;

    // Input the number of elements in the array
    printf("Enter the number of elements in your array: ");
    scanf("%d", &n);

    // Allocate memory for the array
    int *ptr = (int *)malloc(n * sizeof(int));
    if (ptr == NULL)
    {
        // Check if memory allocation is successful
        printf("Memory allocation failed.\n");
        return 1; // Exit the program with an error code
    }

    // Input array elements
    printf("\nEnter %d integers:\n", n);
    for (int i = 0; i < n; i++)
    {
        scanf("%d", ptr + i);
    }

    // Call the function to find and display the minimum and maximum values
    minmax(ptr, n);

    // Free allocated memory
    free(ptr);

    return 0;
}

// Function to find and display the minimum and maximum values in an array
void minmax(int *ptr, int n)
{
    int min, max;

    // Initialize min and max with the first element of the array
    min = max = *ptr;

    // Traverse the array to find the minimum and maximum values
    for (int i = 1; i < n; i++)
    {
        if (*(ptr + i) < min)
            min = *(ptr + i);
        if (*(ptr + i) > max)
            max = *(ptr + i);
    }

    // Display the minimum and maximum values
    printf("\nThe maximum number is %d.\n", max);
    printf("The minimum number is %d.\n", min);
}

```

```
manish@fedora: ~/vs-code/bca-programming-repo/C/Dynamic_M
$ ./question1
Enter the number of elements in your array: 5

Enter 5 integers:
12 -3 43 6 9

The maximum number is 43.
The minimum number is -3.
```

```c
/*Program that reads the marks of n courses and finds the sum and average using the dynamic
array using dynamic memory allocation function malloc()*/
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int n;
    float *p, sum = 0, avg;

    // Input the number of courses
    printf("How many courses of a student? ");
    scanf("%d", &n);

    // Allocate memory for storing marks
    p = (float *)malloc(n * sizeof(float));
    if (p == NULL)
    {
        // Check if memory allocation is successful
        printf("Memory allocation failed.\n");
        return 1; // Exit the program with an error code
    }

    // Input marks for each course
    printf("Enter marks of each course:\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%f", p + i);
        sum += *(p + i);
    }

    // Calculate the average marks
    avg = sum / n;

    // Display the sum and average marks
    printf("The sum of the marks is %.2f\n", sum);
    printf("The average marks is %.2f\n", avg);

    // Free allocated memory
    free(p);

    return 0;
}
```

```
manish@fedora: ~/vs-code/bca-programming-repo/C/Dynamic_M
$ ./question2
How many courses of a student? 5
Enter marks of each course:
45 65.44 12 90 87.5
The sum of the marks is 299.94
The average marks is 59.99

manish@fedora: ~/vs-code/bca-programming-repo/C/Dynamic_M
$
```

```c
/*Program to sort the n-elements reading from user and storing dynamic memory
allocation and then sorting in ascending order*/
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int n;

    // Input the number of elements
    printf("How many numbers: ");
    scanf("%d", &n);

    // Allocate memory for storing numbers
    int *ptr = (int *)calloc(n, sizeof(int));
    if (ptr == NULL)
    {
        // Check if memory allocation is successful
        printf("Memory allocation failed.\n");
        return 1; // Exit the program with an error code
    }

    // Input numbers
    printf("Enter numbers:\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%d", ptr + i);
    }

    // Bubble sort in ascending order
    for (int i = 0; i < n - 1; i++)
    {
        for (int j = 0; j < n - 1 - i; j++)
        {
            if (*(ptr + j) > *(ptr + j + 1))
            {
                // Swap elements if they are in the wrong order
                int temp = *(ptr + j);
                *(ptr + j) = *(ptr + j + 1);
                *(ptr + j + 1) = temp;
            }
        }
    }

    // Display the sorted list
    printf("\nSorted List is:\n");
    for (int i = 0; i < n; i++)
    {
        printf("%d ", *(ptr + i));
    }

    // Free allocated memory
    free(ptr);

    return 0;
}

```


manish@fedora: ~/vs-code/bca-programming-repo/C/Dynamic_
$ ./question3
How many numbers: 5
Enter numbers:
5 4 3 2 1
Sorted List is:
1 2 3 4 5 %
manish@fedora: ~/vs-code/bca-programming-repo/C/Dynamic_