Exercise 1

Code

```c
#include <stdio.h>

#include <stdlib.h>


void info(char *symbols)

{

    int i;

    printf("\tYou need to enter 3 symbols, by which will be built pyramid!\n");

    for(i=0; i<3; i++)

    {

        printf("\nPlease, enter symbol #%d : ", i+1);

        scanf("%s", &symbols[i]);

    }

}


void pyramid(char *symbols)

{

    int arr[6][11] =
{{0,0,0,0,0,1,0,0,0,0,0},{0,0,0,0,1,2,1,0,0,0,0},{0,0,0,1,2,3,2,1,0,0,0},{0,0,1,2,3,3,3,2,1,0,0},{0,1,2,3,3,3,
3,3,2,1,0},{1,2,3,3,3,3,3,3,3,2,1}};

    int i, j;

    for(i=0; i<6; i++)

    {

        for(j=0; j<11; j++)

        {

            if(arr[i][j] == 0)

            {

                printf("   ");

            }

            if(arr[i][j] == 1)
```

```c
            {
                printf(" %c ", symbols[0]);
            }
            if(arr[i][j] == 2)
            {
                printf(" %c ", symbols[1]);
            }
            if(arr[i][j] == 3)
            {
                printf(" %c ", symbols[2]);
            }
        }
        printf("\n\n");
    }
}


int main()
{
    char sym[3];
    info(sym);
    pyramid(sym);
    return 0;
}
```

Test part

Case 1:

Case 2:

Case 3:

Explanations

<u>void info(char *symbols)</u> – function with 1 parameter – pointer to first element of char array(3 symbols that will be entered).

Using this function program asks the user to enter 3 symbols, which later will be used to build pyramid.

<u>void pyramid(char *symbols)</u> – function with the same parameter, which was used to build pyramid using two-dimensional array and loop *for* which was used to go around array and display its elements on the screen.

<u>int main()</u> – main function, where we call functions void info() and void pyramid().

More information about the code can be found in the file task_1.c!

Exercise 2

Code

```c
#include <stdio.h>

#include <stdlib.h>


int main()

{


    float driver_salary;

    float cost_of_fuel;

    char car_type;

    double gallon = 4.54609;

    float unleaded = 1.50;

    float diesel = 1.30;

    float cost_fuel_per_litre;


    int Distance_in_buildup_area;

    int Distance_in_single_carriageways;

    int Distance_in_double_carriageways_or_motorways;


    int consumption_in_buildup_area;

    int consumption_in_single_carriageways;

    int consumption_in_double_carriageways_or_motorways;


    float litres_consumpted;

    float litres_in_buildup_area;

    float litres_in_single_carriageways;
```

```c
    float litres_in_double_carriageways_or_motorways;


    float salary_10;

    float salary_20;

    float salary_30;

    float salary_excess;


    printf("\tEnter the distance in built-up areas : ");

    scanf("%d", &Distance_in_buildup_area);

    printf("\tEnter the distance in single carriageways : ");

    scanf("%d", &Distance_in_single_carriageways);

    printf("\tEnter the distance in double carriageways/motorways : ");

    scanf("%d", &Distance_in_double_carriageways_or_motorways);


    printf("\tPlease choose your car type(A or B): ");

    scanf("%s", &car_type);

    if(car_type = 'A')

    {

        cost_fuel_per_litre = unleaded;

        consumption_in_buildup_area = 40;

        consumption_in_single_carriageways = 50;

        consumption_in_double_carriageways_or_motorways = 60;

    }

    if(car_type == 'B')

    {

        cost_fuel_per_litre = diesel;

        consumption_in_buildup_area = 45;

        consumption_in_single_carriageways = 55;
```

```
        consumption_in_double_carriageways_or_motorways = 65;

    }


    litres_in_buildup_area =
(float)Distance_in_buildup_area/(float)consumption_in_buildup_area*gallon*Distance_in_bui
ldup_area;

    litres_in_single_carriageways =
(float)Distance_in_single_carriageways/(float)consumption_in_single_carriageways*gallon*D
istance_in_single_carriageways;

    litres_in_double_carriageways_or_motorways =
(float)Distance_in_double_carriageways_or_motorways/(float)consumption_in_double_carri
ageways_or_motorways*gallon*Distance_in_double_carriageways_or_motorways;

    litres_consumpted = litres_in_buildup_area + litres_in_single_carriageways +
litres_in_double_carriageways_or_motorways;


    cost_of_fuel = cost_fuel_per_litre * litres_consumpted;


    if(cost_of_fuel >= 10)

    {

        salary_10 = 10;

        if(cost_of_fuel-10 >= 20)

        {

            salary_20 = 40;

            if(cost_of_fuel-30 >= 30)

            {

                salary_30 = 90;

                if(cost_of_fuel > 60)

                {

                    salary_excess = (cost_of_fuel-60)*5;

                    driver_salary = salary_10+salary_20+salary_30+salary_excess;

                }
```

```c
                else
                {
                    driver_salary = salary_10+salary_20+salary_30;
                }


            }
            else
            {
                driver_salary = salary_10+salary_20+((cost_of_fuel-30)*3);
            }
        }
        else
        {
            driver_salary = salary_10 + ((cost_of_fuel-10)*2);
        }
    }
    else
    {
        driver_salary = cost_of_fuel;
    }
    printf("\n\tType of vehicle:                      %c\n", car_type);
    printf("\tDistance in built-up areas:              %d\n", Distance_in_buildup_area);
    printf("\tDistance in single carriageways:           %d\n",
Distance_in_single_carriageways);
    printf("\tDistance in double carriageways/motorways:      %d\n",
Distance_in_double_carriageways_or_motorways);
    printf("\tFuel cost = %.2f  Driver's salary = %.2f  Total cost = %.2f", cost_of_fuel,
driver_salary, cost_of_fuel+driver_salary);
    return 0;
}
```

Test part

Case 1:

```
C:\Users\Administrator\Desktop\GF_reports\task243625\task_2\task_2.exe                    —    □    ×

          Enter the distance in built-up areas : 10
          Enter the distance in single carriageways : 15
          Enter the distance in double carriageways/motorways : 25
          Please choose your car type(A or B): A

          Type of vehicle:                           A
          Distance in built-up areas:                10
          Distance in single carriageways:           15
          Distance in double carriageways/motorways: 25
          Fuel cost = 118.77  Driver's salary = 433.83  Total cost = 552.60
Process returned 0 (0x0)   execution time : 19.037 s
Press any key to continue.
```

Case 2:

```
C:\Users\Administrator\Desktop\GF_reports\task243625\task_2\task_2.exe                    —    □    ×

          Enter the distance in built-up areas : 80
          Enter the distance in single carriageways : 30
          Enter the distance in double carriageways/motorways : 20
          Please choose your car type(A or B): A

          Type of vehicle:                           A
          Distance in built-up areas:                80
          Distance in single carriageways:           30
          Distance in double carriageways/motorways: 20
          Fuel cost = 1259.27  Driver's salary = 6136.33  Total cost = 7395.60
Process returned 0 (0x0)   execution time : 7.539 s
Press any key to continue.
```
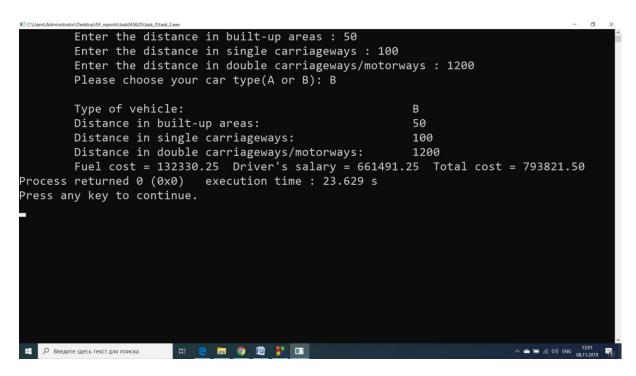
Case 3:


```
       Enter the distance in built-up areas : 20
       Enter the distance in single carriageways : 50
       Enter the distance in double carriageways/motorways : 500
       Please choose your car type(A or B): B

       Type of vehicle:                               B
       Distance in built-up areas:                    20
       Distance in single carriageways:               50
       Distance in double carriageways/motorways:     500
       Fuel cost = 23051.62  Driver's salary = 115098.08  Total cost = 138149.69
Process returned 0 (0x0)   execution time : 10.356 s
Press any key to continue.
```

Case 4:


```
       Enter the distance in built-up areas : 50
       Enter the distance in single carriageways : 100
       Enter the distance in double carriageways/motorways : 1200
       Please choose your car type(A or B): B

       Type of vehicle:                               B
       Distance in built-up areas:                    50
       Distance in single carriageways:               100
       Distance in double carriageways/motorways:     1200
       Fuel cost = 132330.25  Driver's salary = 661491.25  Total cost = 793821.50
Process returned 0 (0x0)   execution time : 23.629 s
Press any key to continue.
```

Explanations

Names of all variables correspond to their functionality.

In the beginning of program user is asked to enter values:

1) Distance in built-up areas;
2) Distance in single carriageways;
3) Distance in double carriageways/motorways;
4) Car type.

After this, depends on the chosen type of car program get values of:

1) Cost of fuel per litre(1.5 if type A, 1.3 if type B);
2) Consumption in miles per gallon in three types of area;

After this program counts how much fuel was in every area and after during all trip

Multiplied consumed fuel with cost per litre was received sum of ponds which was spent for fuel.

Driver's salary was received with the help of "if" operators, depend on amount of pounds spent for fuel.

More information about the code can be found in the file task_2.c!