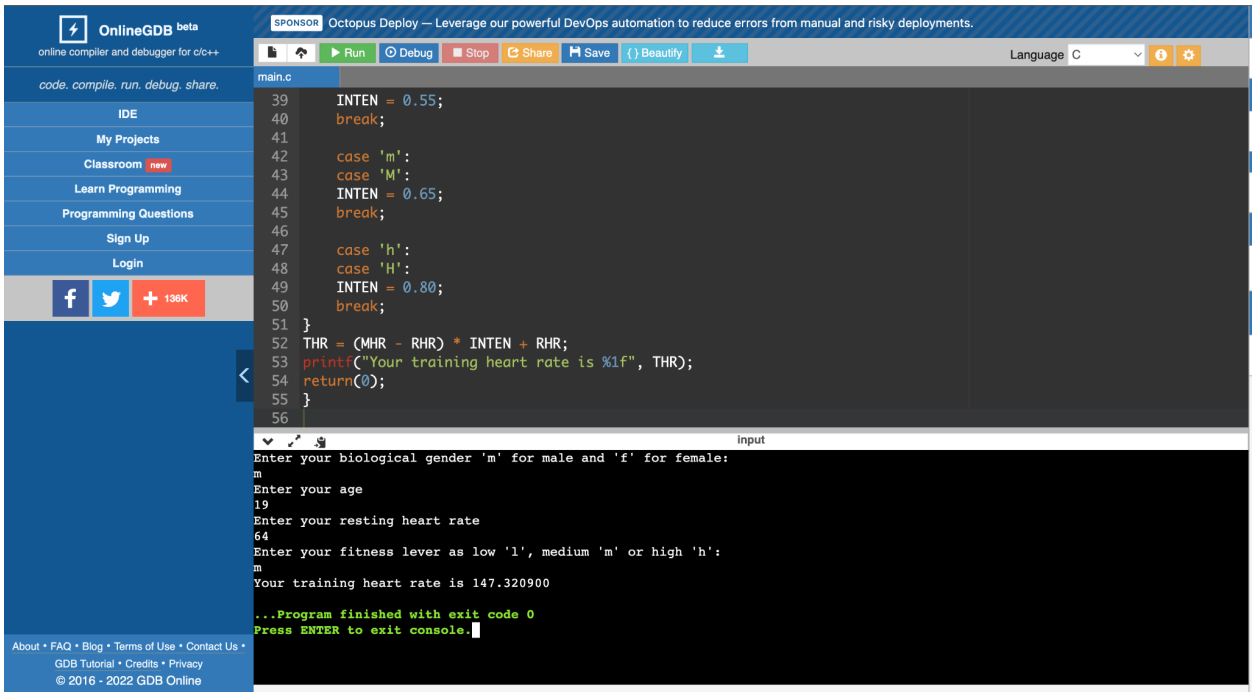
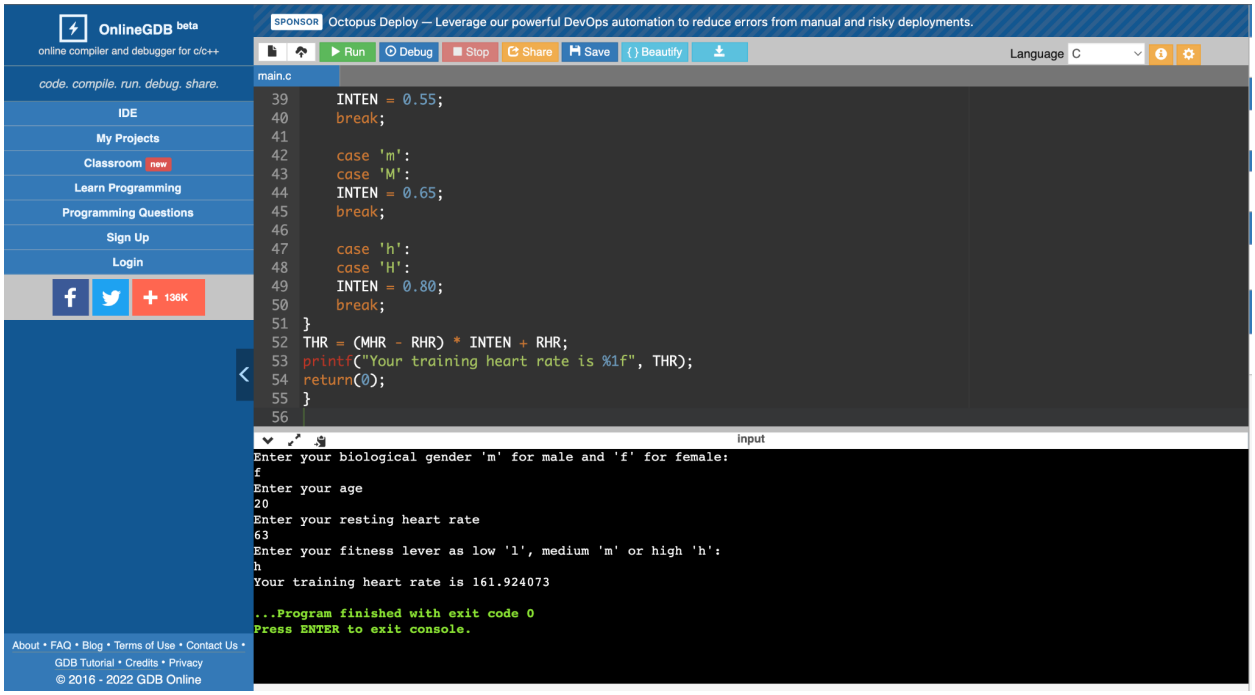
Hamza Ejaz Malik , 501112545

Problem #1:

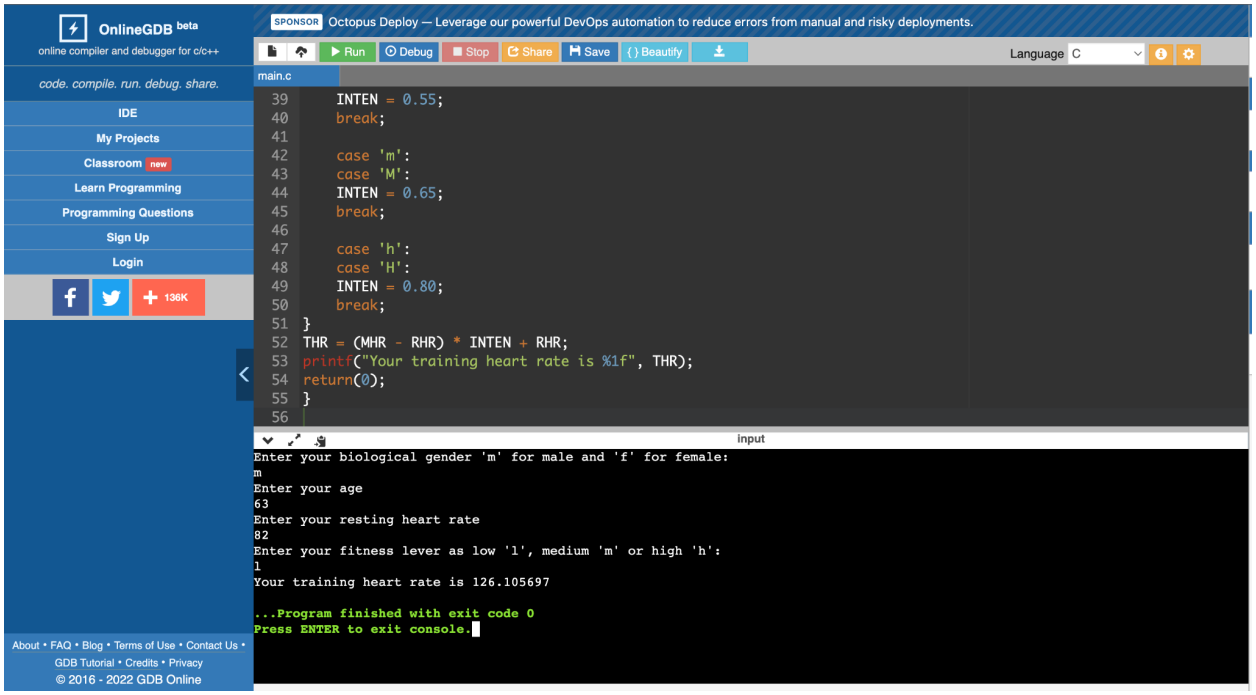
(a)



(b)



(c)



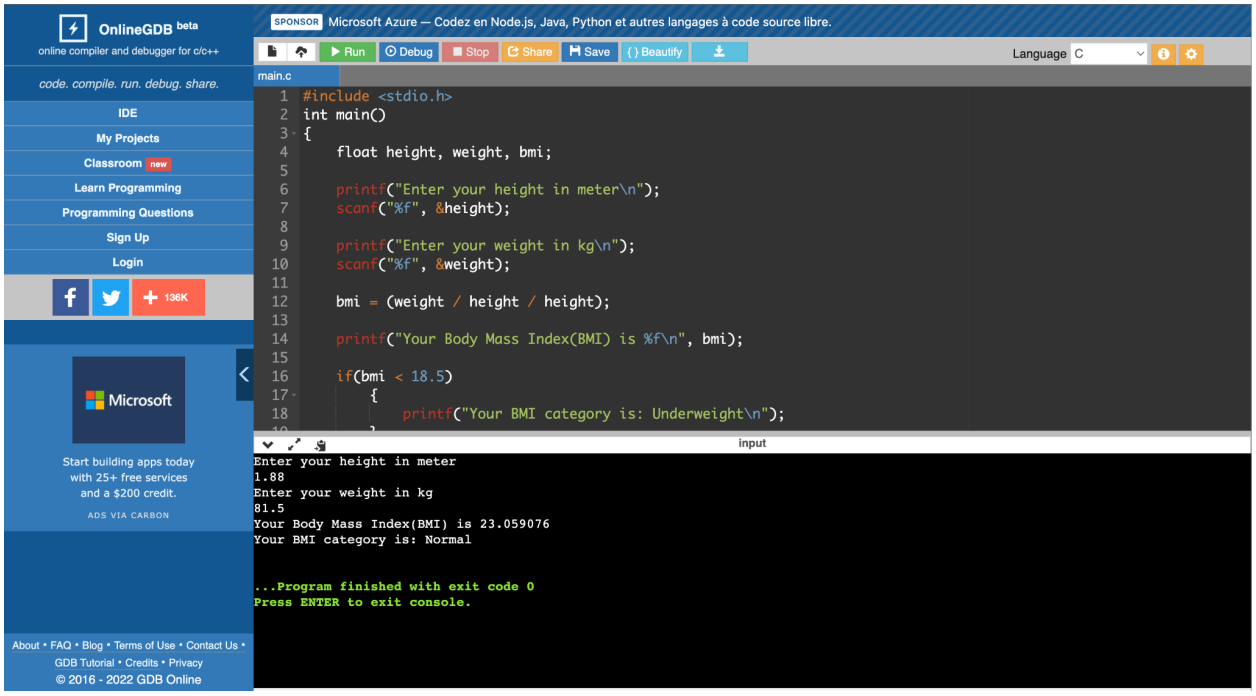
Code for problem # 1:

```
// The heart rate calculated is in bpm
#include <stdio.h>
#include <math.h>
int
main(void)
{
int age , RHR;
char gender, fitness;
double INTEN, MHR, THR;
//Enter your Gender m or f
printf ("Enter your biological gender 'm' for male and 'f' for female:\n");
scanf ("%c", &gender);

// Enter your age
printf ("Enter your age\n");
scanf ("%d", &age);

// Enter your resting heart rate
printf ("Enter your resting heart rate\n");
scanf ("%d", &RHR);

//Enter your fitness level
getchar();
```

```
printf("Enter your fitness lever as low 'l', medium 'm' or high 'h': \n");
scanf ("%c", &fitness);


switch(gender)
{
   case 'm':
   case 'M':
   MHR = 203.7/(1+exp(0.033*(age-104.3)));
   break;

   case 'f':
   case 'F':
   MHR = 190.2/(1+exp(0.0453*(age-107.5)));
   break;
}
switch(fitness)
{
   case 'l':
   case 'L':
   INTEN = 0.55;
   break;

   case 'm':
   case 'M':
   INTEN = 0.65;
   break;

   case 'h':
   case 'H':
   INTEN = 0.80;
   break;
}
// Displays your training heart rate in bpm
THR = (MHR - RHR) * INTEN + RHR;
printf("Your training heart rate is %1f bpm" , THR);
return(0);
}
```

Problem #2:

(a)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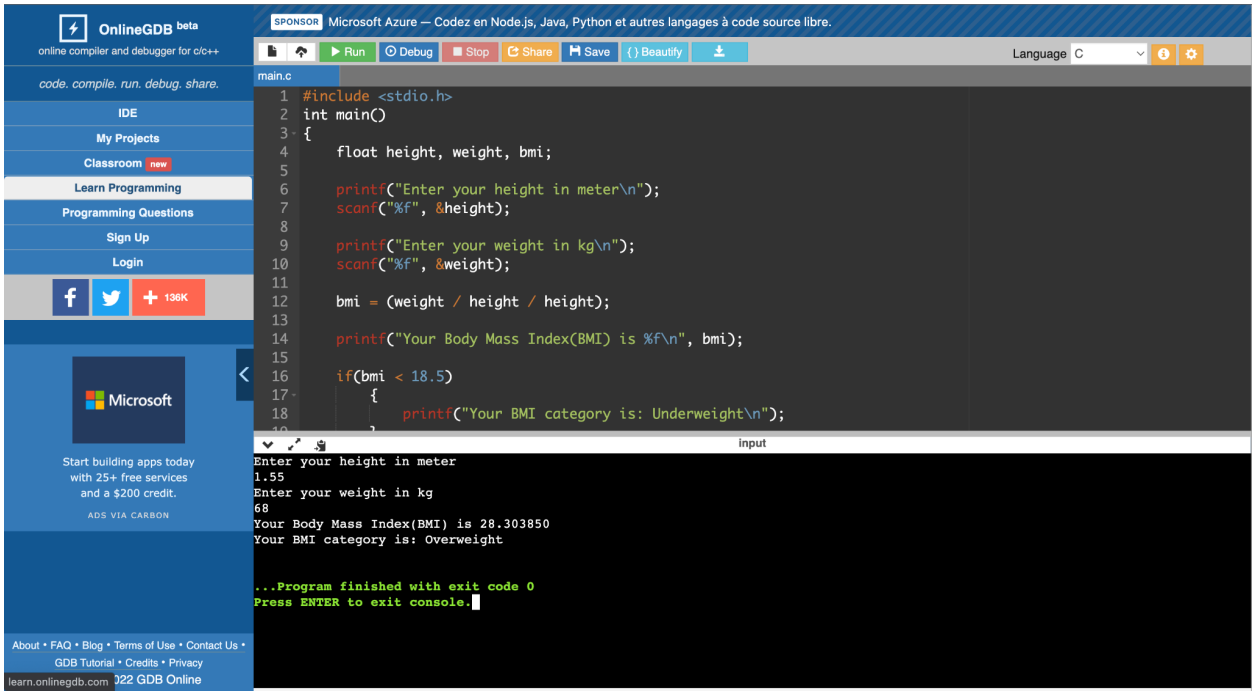
Language C
main.c
#include <stdio.h>
int main()
{
float height, weight, bmi;
printf("Enter your height in meter\n");
scanf("%f", &height);
printf("Enter your weight in kg\n");
scanf("%f", &weight);
bmi = (weight / height / height);
printf("Your Body Mass Index(BMI) is %f\n", bmi);
if(bmi < 18.5)
{
printf("Your BMI category is: Underweight\n");
input
Enter your height in meter
1.88
Enter your weight in kg
81.5
Your Body Mass Index(BMI) is 23.059076
Your BMI category is: Normal
...Program finished with exit code 0
Press ENTER to exit console.

(b)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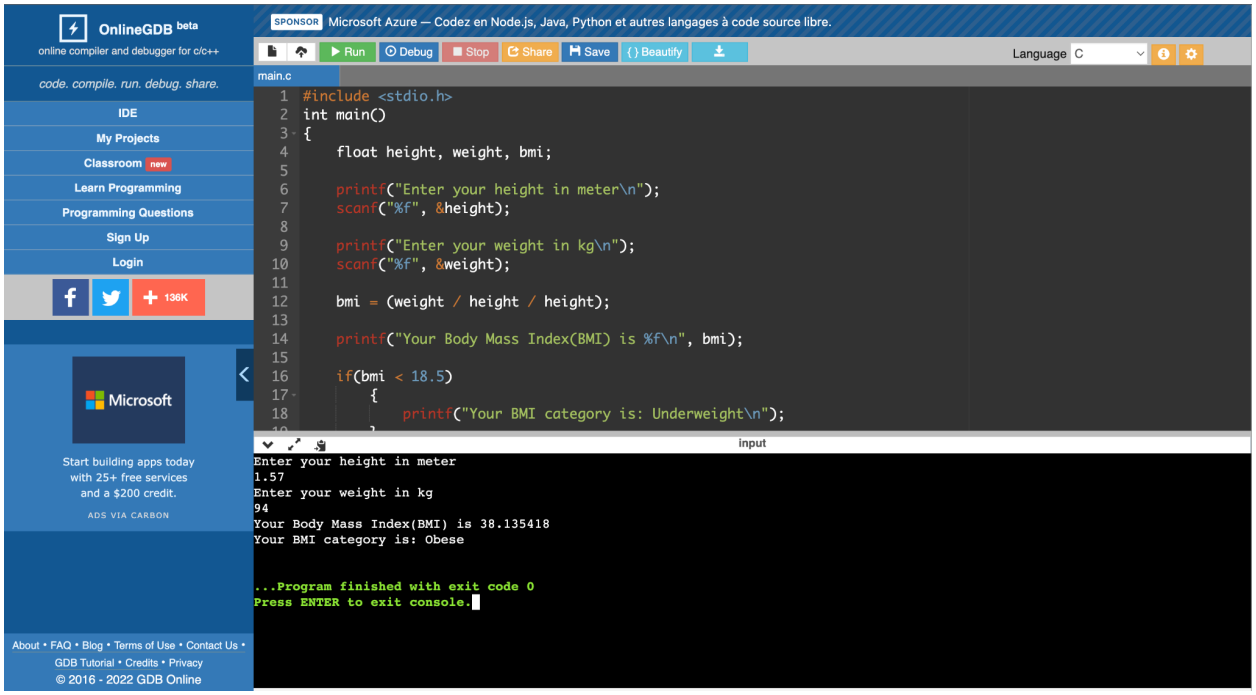
Language C
main.c
#include <stdio.h>
int main()
{
float height, weight, bmi;
printf("Enter your height in meter\n");
scanf("%f", &height);
printf("Enter your weight in kg\n");
scanf("%f", &weight);
bmi = (weight / height / height);
printf("Your Body Mass Index(BMI) is %f\n", bmi);
if(bmi < 18.5)
{
printf("Your BMI category is: Underweight\n");
input
Enter your height in meter
1.55
Enter your weight in kg
68
Your Body Mass Index(BMI) is 28.303850
Your BMI category is: Overweight
...Program finished with exit code 0
Press ENTER to exit console.

(c)



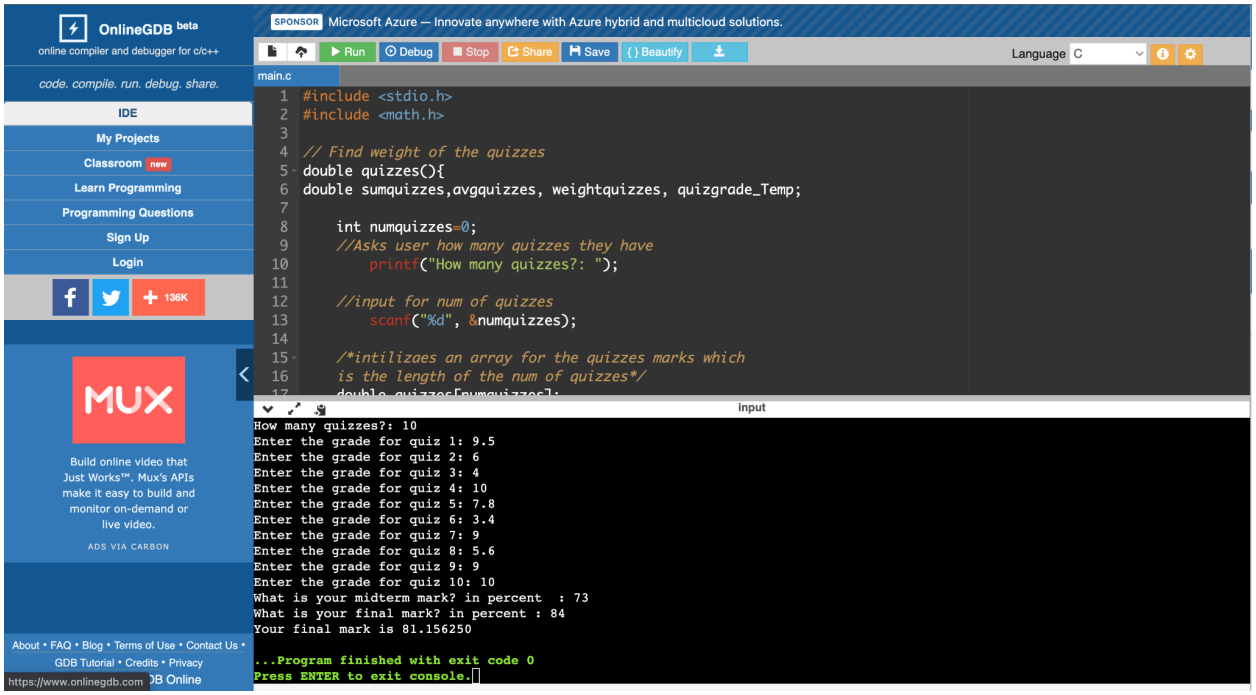
Code for problem # 2:

```
#include <stdio.h>
int main()
{
   float height, weight, bmi;

   //Enter your height in meters
   printf("Enter your height in meter\n");
   scanf("%f", &height);

  //Enter your weight in kg
   printf("Enter your weight in kg\n");
   scanf("%f", &weight);

   // bmi calculation with weight in kg and height in m
   bmi = (weight / height / height);

   printf("Your Body Mass Index(BMI) is %f\n", bmi);

   if(bmi < 18.5)
      {
         printf("Your BMI category is: Underweight\n");
      }
```

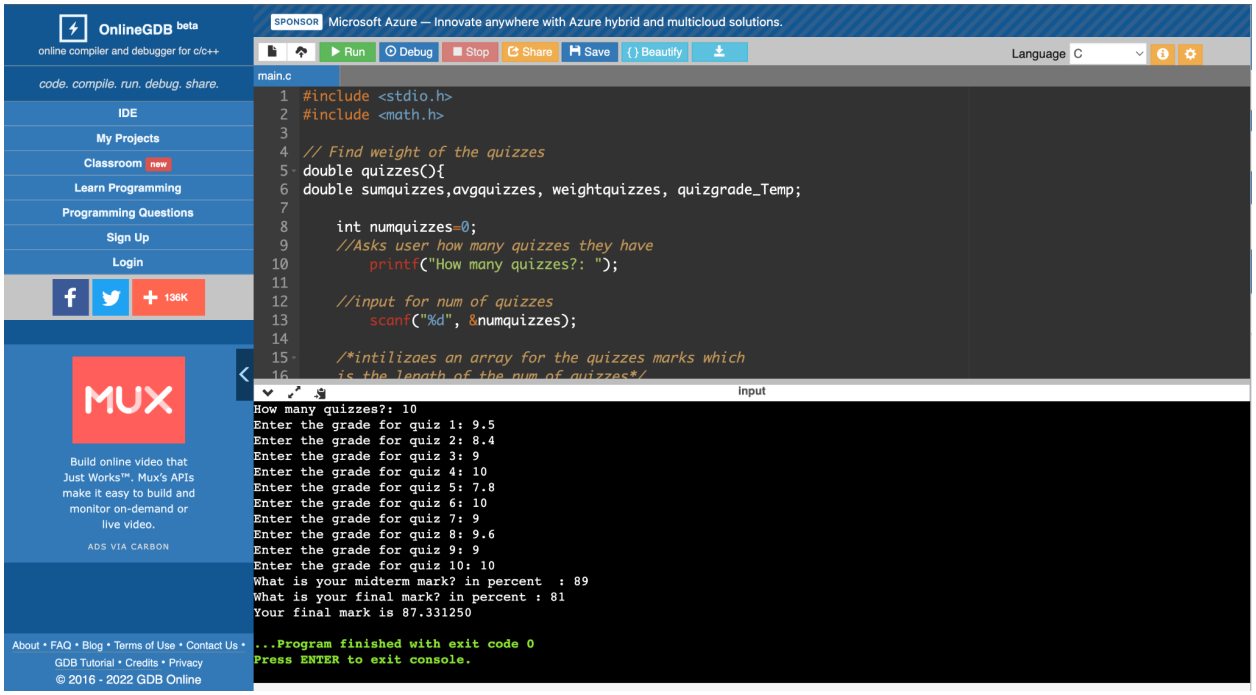
```
    else if(bmi >= 18.5 && bmi <= 24.9)
        {
            printf("Your BMI category is: Normal\n");
        }
    else if(bmi >= 25 && bmi <= 29.9)
        {
            printf("Your BMI category is: Overweight\n");
        }
    else if(bmi >= 30)
        {
            printf("Your BMI category is: Obese\n");
        }
    else
    {
        printf("Wrong entry\n");
    }

    return 0;
}
```

Problem 3:

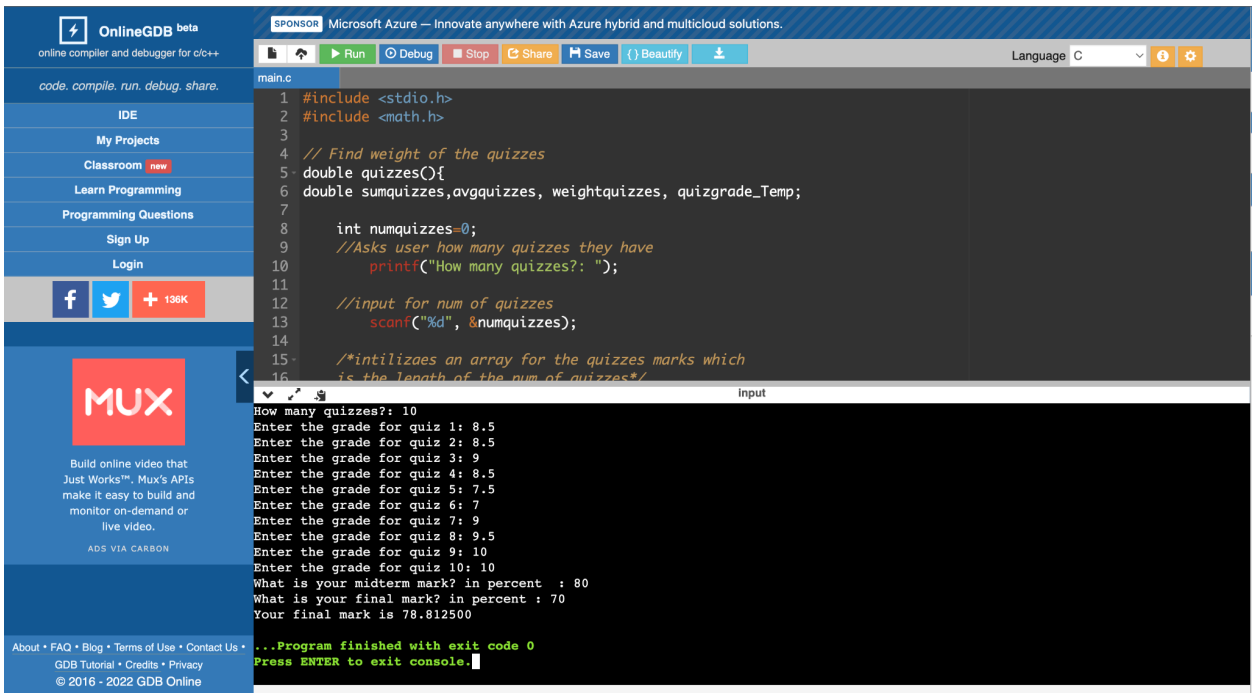
(a)



(b)



(c)



Code for problem # 3:

```
//overall mark is in %
#include <stdio.h>
#include <math.h>
```

```
// Find weight of the quizzes
double quizzes(){

double sumquizzes,avgquizzes, weightquizzes, quizgrade_Temp;

        int numquizzes=0;
        //Asks user how many quizzes they have
           printf("How many quizzes?: ");

    //input for num of quizzes
        scanf("%d", &numquizzes);


        /*intilizaes an array for the quizzes marks which
        is the length of the num of quizzes*/
        double quizzes[numquizzes];



        /*Initliazes for loop, to go through array,
        then Asks for quiz grade and Stores quiz mark
        in corresponding array index*/
        for(int y=0;y<numquizzes;y++){

                printf("Enter the grade for quiz %d: ", y+1);
                scanf("%lf", &quizgrade_Temp);
                quizzes[y]=(quizgrade_Temp/10)*100;
        }

        for(int x=0;x<numquizzes;x++){
                for(int j=x+1;j<numquizzes;j++){


                        if(quizzes[x]>=quizzes[j]){


                                double temp=quizzes[x];
                                quizzes[x]=quizzes[j];
                                quizzes[j]=temp;

                        }

                }
```

```
        }

        int cancel_2grades=numquizzes-(numquizzes-2);

        for(int y=cancel_2grades;y<numquizzes;y++){
                sumquizzes=sumquizzes+quizzes[y];
        }

        avgquizzes=sumquizzes/(numquizzes-2);

        weightquizzes=(avgquizzes/100)*25;

        return(weightquizzes);

}

struct weights_papers {

   double midtermWeightAchieved, finalWeightAchieved;
   };

struct weights_papers papers(){

        double
midterm,midtermWorth,midtermWeightAchieved,final,finalWorth,finalWeightAchieved;

        //Asks users to input midterm mark %
        printf("What is your midterm mark? in percent  : ");
        scanf("%lf", &midterm);

        //Asks users to input final mark %
        printf("What is your final mark? in percent : ");
        scanf("%lf", &final);

   /*If the midterm mark is greater than or equal the final mark,
   then the midterm is worth 35% and the final is 40% */
        if(midterm>=final){

                midtermWorth=35;
                finalWorth=40;

        /*If the final mark is greater than the midterm mark,
        then midterm is worth 25% and the final is 50% */
        }else if(final>midterm){
```

```
                midtermWorth=25;
                finalWorth=50;
        }
        //Calclates weight of midterm acheived
        midtermWeightAchieved=(midterm/100)*midtermWorth;
        //Calclates weight of final acheived
        finalWeightAchieved=(final/100)*finalWorth;

        struct weights_papers s={midtermWeightAchieved,finalWeightAchieved};
        return(s);

}

int main(void){


        double quizzesWeight=quizzes();

        double sum;

        struct weights_papers s=papers();


        //Sums the final grade & prints it
        sum=quizzesWeight+s.midtermWeightAchieved+s.finalWeightAchieved;
        printf("Your final mark is %lf ", sum);
}
```

END OF LAB