```c
/*##############################################################################  */
/*                                                                               */
/* HW05_Sahin_Egilmez_131044059_part1.c                                          */
/*                                                                               */
/* Created on 21/03/2015 by Sahin Egilmez                                        */
/*                                                                               */
/*Description                                                                    */
/*                                                                               */
/*C program for  car crash simulation                                            */
/*Inputs:                                                                        */
/*      - Two cars and their speeds and weights                                  */
/*Outputs:                                                                       */
/*      - Print to screen diagram of cars before crash                           */
/*      - Print to screen diagram of cars after crash                            */
/*##############################################################################*/
/*------------------------------------------------------------------------------*/
/*                           Includes                                           */
/*------------------------------------------------------------------------------*/
#include<stdio.h>
/*------------------------------------------------------------------------------*/
/*                           Defines                                            */
/*------------------------------------------------------------------------------*/
#define ROAD_LENGHT 50
typedef enum {PLAY,CRASH,END} object_state;
/*##############################################################################*/
/*                         Function Prototypes                                  */
/*##############################################################################*/
/*this function determine positions of cars                                     */
void make_move(char *object1, double *position1, double *speed1, int weight1,
               char *object2, double *position2, double *speed2, int weight2,
               object_state *game_state);
/*this function calculate the car crash time                                    */
double car_crash_time(double position1, double position2,
                      double speed1, double speed2);
/*this function print to screen all states.                                     */
void print_game_state(char object1, double position1,
                      char object2, double position2,
                      object_state game_state);

int main()
{
        object_state game_state=PLAY;/*defines the game state*/
        char object1,object2;/*defines the characters of cars*/
        double position1=0,position2=ROAD_LENGHT;/*defines positions of cars*/
        double speed1,speed2,weight1,weight2;/*defines speeds, weights of cars*/
        double crash_time;/*defines the crash time*/
        /*enter the characters of cars,speeds and weights on keyboard*/
        scanf("%c %c %lf %lf %lf %lf",&object1,&object2,&speed1,&speed2,&weight1,&weight2);
        /*this loop for working the program before crash*/
        while(game_state==PLAY) {
                /*call the print function*/
                print_game_state(object1,position1,object2,position2,game_state);
                /*call the move function*/
                make_move(&object1,&position1,&speed1,weight1,&object2,&position2,&speed2,
weight2,&game_state);

        }
        /*crash time calculating and assign position1*/
        crash_time=car_crash_time(position1,position2,speed1,speed2);
        position1=crash_time;
        /*this loop for working the program after crash*/
        while(game_state==CRASH){
                /*call the print function*/
                print_game_state(object1,position1,object2,position2,game_state);
                /*call the move function*/
                make_move(&object1,&position1,&speed1,weight1,&object2,&position2,&speed2,
weight2,&game_state);
        }

        return 0;
}
/*this function determine positions of cars                                     */
```

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void make_move(char *object1, double *position1, double *speed1, int weight1,char *object2, double
*position2, double *speed2, int weight2, object_state *game_state)
{

        double speed3,crash_time;/*defines the temporary value*/
        /*this statement for calculate the position1 after crash*/
        if(*game_state==CRASH) {
                *position1=(*position1+(*speed1));
        }
        /*this statement for calculate the positions before crash*/
        if(((*speed1-*speed2)<=(*position2-*position1)) && *game_state==PLAY) {
        *position1=(*position1+*speed1);
        *position2=(*position2+*speed2);
        }
        /*this statement for calculate speed and car characters when crash*/
        else if(*game_state==PLAY) {
        *object1='X';
        *object2='X';
        *game_state=CRASH;
        speed3=(((*speed1)*(weight1))+((*speed2)*(weight2)))/(weight1+weight2);
        *speed1=speed3;
        }
        /*this statement for end of the program*/
        if(*position1<0 || *position1>=ROAD_LENGHT-1) {
                *game_state=END;
        }

}
/*this function calculate the car crash time                                    */
double car_crash_time(double position1, double position2, double speed1, double speed2)
{
        double position3,rate,crash_lenght;/*defines the function elements*/
        /*this statement for speed1>speed2 stuation*/
        /*this statement calculate the position after crash*/
        if(speed1>(-speed2)) {
        rate=(speed1/(-speed2));
        crash_lenght=rate*((position2-position1)/(rate+1));
        position3=position1+crash_lenght;
        }
        /*this statement for speed2>speed1 stuation*/
        /*this statement calculate the position after crash*/
        else {
        rate=((-speed2)/speed1);
        crash_lenght=rate*((position2-position1)/(rate+1));
        position3=position2-crash_lenght+1;
        }

        return position3;

}

/*this function print to screen all states.                                     */
void print_game_state(char object1, double position1, char object2, double position2, object_state
game_state)
{
        int a[ROAD_LENGHT],m,n,f;/*defines the array and function elementd*/
        int number=1;/*defines the number*/
        double i,j,k;/*defines the function elements*/
        /*this statement for control before last stuation*/
        if(position1>=0 && position1<ROAD_LENGHT) {
                /*this loop for print to screen '_' until position1.*/
                for(i=0;i<position1;i++) {
                        printf("_");
                }
                printf("%c",object1);/*print to screen car1 characters*/
                 /*this statement for before crash*/
                if(game_state==PLAY) {
                        /*this loop for print to screen '_' until position2*/
                        for(j=position1;j<(position2-2);j++) {
                                printf("_");
                        }
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                        printf("%c",object2);/*print to screen car2 characters*/
                        /*this loop for print to scree '_2 until ROAD_LENGHT*/
                        for(k=position2;k<ROAD_LENGHT;k++) {
                                printf("_");
                        }
                }
                else {
                        /*this loop for print to scree '_2 until ROAD_LENGHT*/
                        for(f=position1+0.99;f<ROAD_LENGHT-1;++f) {
                                printf("_");
                        }
                }
        }
        /*this statement for last diagram*/
        else if(position1>=ROAD_LENGHT) {
                for(k=1; k<ROAD_LENGHT;++k) {
                        printf("_");
                }
                printf("%c",object1);
                }
        else {
                printf("%c",object1);
                for(k=1; k<ROAD_LENGHT;k++) {
                        printf("_");
                }
        }


        printf("\n");
        /*after this part print position using array*/
        a[ROAD_LENGHT];
        for(m=0;m<ROAD_LENGHT;++m) {
                a[m]=number;
                number++;
                if(number==10) {
                        number=0;
                }
        }
        for(n=0;n<ROAD_LENGHT;++n) {
                printf("%d",a[n]);
        }

        printf("\n");

}
/*############################################################################ */
/*                    End of  HW05_Sahin_Egilmez_131044059_part1.c            */
/*############################################################################ */
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