```
/*##############################################################################*/
/*HW5_Emre_Bayram_141044019_part1.c                                             */
/*------------------------------                                                */
/*Written by Emre Bayram on march 23, 2015                                      */
/*Description                                                                   */
/*------------------------------                                                */
/*This program is car crash simulator.                                         */
/*Inputs                                                                        */
/*  -cars characters.                                                           */
/*  -cars speeds.                                                               */
/*  -cars weights.                                                              */
/*  -cars positions.                                                            */
/*Outputs                                                                       */
/*  -diagram of accident.                                                       */
/*##############################################################################*/

/*------------------------------------------------------------------------------*/
/*                              Includes                                        */
/*------------------------------------------------------------------------------*/
#include<stdio.h>

/*------------------------------------------------------------------------------*/
/*                              Defines                                         */
/*------------------------------------------------------------------------------*/
#define ROAD_LENGHT 50.0

/*------------------------------------------------------------------------------*/
/*                              Type Defs                                       */
/*------------------------------------------------------------------------------*/
typedef enum {PLAY, CRASH, END} object_state;

/*------------------------------------------------------------------------------*/
/*                           Function Protypes                                  */
/*------------------------------------------------------------------------------*/

/*##############################################################################*/
/*                                                                              */
/*void make_move(char *object1,double *position1,double *speed1,int weight1,    */
/*             char *object2, double *position2, double *speed2,int weight2,    */
/*             object_state *game_state)                                        */
/*--------------------                                                          */
/*  -object1,object2        car1 and car2 characters.                           */
/*  -position1, position2   car1's position and car2's position.                */
/*  -speed1, speed2         car1's speed and car2's position.                   */
/*  -weight1, weight2       car1's weight and car2's weight.                    */
/*  -game_state             controls car status.                                */
/*                                                                              */
/*Output                                                                        */
/*--------------------                                                          */
/*  calls print_game_stats and prints diagram                                   */
/*                                                                              */
/*Description                                                                   */
/*-------------------                                                           */
/*  Cars runs in this function.                                                 */
/*                                                                              */
/*##############################################################################*/
void make_move(char *object1, double *position1, double *speed1, int weight1,
               char *object2, double *position2, double *speed2, int weight2,
               object_state *game_state);

/*##############################################################################*/
/*                                                                              */
/*double car_crash_time(double position1, double position2,                     */
/*                    double speed1, double speed2)                             */
/*-------------------                                                           */
/*  -position1, position2   car1's position and car2's position.                */
/*  -speed1, speed2         car1's speed and car2's position.                   */
/*                                                                              */
/*Output                                                                        */
/*-------------------                                                           */
/*  crash time                                                                  */
/*                                                                              */
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/*Description                                                           */
/*-------------------                                                   */
/*  This function calculetes crash time and returns as value.           */
/*                                                                       */
/*#######################################################################*/
double car_crash_time(double position1, double position2,
                      double speed1, double speed2);

/*#######################################################################*/
/*void print_game_state(char object1, double position1,                  */
/*                      char object2, double position2,                  */
/*                      object_state game_state)                         */
/*-------------------                                                   */
/*  -object1,object2        car1 and car2 characters.                    */
/*  -position1, position2   car1's position and car2's position.         */
/*  -game_state             cars status.                                 */
/*                                                                       */
/*Output                                                                */
/*-----------------                                                     */
/*  -prints according to values of cars information                      */
/*                                                                       */
/*Description                                                           */
/*---------------                                                       */
/*  This function prints according to cars position and status.          */
/*                                                                       */
/*#######################################################################*/
void print_game_state(char object1, double position1,
                      char object2, double position2,
                      object_state game_state);


int main()
{
    char object1,object2;                       /*variables for cars*/
    int weight1,weight2;                        /*weights of cars*/
    double position1,position2,speed1,speed2;   /*positions and speeds*/
    object_state d=PLAY;                        /*simulator status*/

    /*get characters values*/
    printf("Enter CAR1 character and CAR2 character>");
    scanf("%c %c",&object1,&object2);
    /*get weights values*/
    printf("\nEnter CAR1 weight and CAR2 weight>");
    scanf("%d%d",&weight1,&weight2);
    /*get speed values*/
    printf("\nEnter CAR1 speed AND CAR2 speed>");
    scanf("%lf%lf",&speed1,&speed2);
    /*get positions of cars*/
    printf("\nEnter CAR1 position and CAR2 position(Road lenght is 50)>");
    scanf("%lf%lf",&position1,&position2);
    /*call make move function*/
    make_move(&object1,&position1,&speed1,weight1,&object2,&position2,&speed2,weight2,&d);

    return 0;
}

void make_move(char *object1, double *position1, double *speed1, int weight1,
               char *object2, double *position2, double *speed2, int weight2,
               object_state *game_state)
{
    double crash_time;
    int i;
    double total_speed;
    /*make function needs crash time so call crash time function.*/
    crash_time=car_crash_time(*position1,*position2,*speed1,*speed2);

    do{
    //  print_game_state(*object1,*position1,*object2,*position2,*game_state);
        /*printing for play status*/
        for(i=0;i<crash_time;++i){
            print_game_state(*object1,*position1,*object2,*position2,*game_state);
            *position1+=*speed1;
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            *position2+=*speed2;
            if (*position1>=*position2){
                    *game_state=CRASH;
                    /*momentum calculation.*/
                    total_speed=((*speed1 * weight1)+(*speed2 * weight2))/(weight1+weight2);
                    /*After crash Sybomls turns X characters*/
                    *object1='X';
                    *object2='X';
            }
        }

        while(*position1>0 && *position1 < ROAD_LENGHT){
            *position1+=total_speed;
            print_game_state(*object1,*position1,*object2,*position2,*game_state);
        }
        *game_state=END;
        /*printing end status.*/
        print_game_state(*object1,*position1,*object2,*position2,*game_state);
    }
    while(*game_state!=END);
}
double car_crash_time(double position1, double position2, double speed1, double speed2)
{
    double crash_time;
    crash_time=(position1 - position2)/(speed2 - speed1);
    return crash_time;
}
void print_game_state(char object1, double position1,
                      char object2, double position2,
                      object_state game_state)
{
    int i,m;
    if(game_state==PLAY){
        for(i=0;i<position1;++i)
            printf("_");
        printf("%c",object1);
        for(i=0;i<position2-position1;++i)
            printf("_");
        printf("%c",object2);
        for(i=0;i<ROAD_LENGHT-position2;++i)
            printf("_");
        printf("\n");
        for(i=0;i<=5;++i){
            for(m=0;m<=9;++m)
                printf("%d",m);
        }
        printf("\n");
    }

    if (game_state==CRASH){
        for(i=0;i<position1;++i)
            printf("_");
        printf("%c",object1);
        for(i=0;i<=ROAD_LENGHT-position1;++i)
            printf("_");
        printf("\n");
        for(i=0;i<=5;++i){
            for(m=0;m<=9;++m)
                printf("%d",m);
        }
        printf("\n");
    }
    if (game_state==END)
        printf("Diagram finished succesfully\n");
}
```