```
/*##############################################################################*/
/*HW05_part1.c                                                                  */
/*_____________________________                                                 */
/*Written by Mustafa Akilli on March 22, 2015                                   */
/*                                                                              */
/*Description                                                                   */
/*___________                                                                   */
/*   A car crash simulator program.                                             */
/*Inputs:                                                                       */
/*  -Name of Car 1                                                              */
/*  -Name of Car 2                                                              */
/*  -Speed of Car 1                                                             */
/*  -Speed of Car 2                                                             */
/*  -Weight of Car 1                                                            */
/*  -Weight of Car 2                                                            */
/*Outputs:                                                                      */
/*  -Crash Simulator                                                            */
/*##############################################################################*/
/*                                                                              */
/*------------------------------------------------------------------------------*/
/*                              Includes                                        */
#include <stdio.h>
/*------------------------------------------------------------------------------*/

/*                              Defines                                         */
#define WAY_END 50.0
#define WAY_START 1.0
#define WAY_NUMBER 10.0
/*------------------------------------------------------------------------------*/

typedef enum{PLAY,CRASH,END}object_state;

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);

void print_game_state(char object1, double position1, char object2,
double position2, object_state game_state);

int
main(void)
{
    char object1,object2;
    double speed1,speed2,position1,position2;
    int weight1,weight2;
    object_state game_state,game_state2,game_state3;

    printf("Name of Car 1:");
    scanf("%c",&object1);
    printf("Name of Car 2:");
    scanf(" %c",&object2);
    printf("Speed of Car 1:");
    scanf("%lf",&speed1);
    printf("Speed of Car 2:");
    scanf("%lf",&speed2);
    printf("Weight of Car 1:");
    scanf("%d",&weight1);
    printf("Weight of Car 2:");
    scanf("%d",&weight2);

    position1=WAY_START;
    position2=WAY_END;

/*                              PLAY                                            */
    game_state=PLAY;

    make_move(&object1, &position1, &speed1, weight1, &object2,
    &position2, &speed2, weight2, &game_state);
/*------------------------------------------------------------------------------*/
```

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/*                              CRASH                                          */
    game_state2=CRASH;

    make_move(&object1, &position1, &speed1, weight1, &object2,
    &position2, &speed2, weight2, &game_state2);
/*-------------------------------------------------------------------------*/
}

/**************************************************************************
 * call car_crash_time fonk.                                              *
 * -1 add to crash_time.                                                  *
 * until crash_time be 0,                                                 *
 * call print_game_state fonk.                                            *
 * calculate new speed,                                                   *
 * calculate new position,                                                *
 * calculate end_time.                                                    *
 * new speed add to end_time                                              *
 * until end_time be 0,                                                   *
 * call print_game_state fonk.                                            *
 **************************************************************************/
void make_move(char *object1, double *position1, double *speed1, int weight1,
char *object2, double *position2, double *speed2, int weight2, object_state
*game_state)
{
    int crash_time,temp_crash_time;
    double new_speed,new_position,end_time;

    crash_time = car_crash_time(*position1, *position2, *speed1, *speed2);

    switch(*game_state){

        case PLAY :   temp_crash_time = crash_time;
                      while(crash_time>0)
                      {
                         print_game_state(*object1, *position1, *object2,
                         *position2, *game_state);
                      if(*speed1>0)
                      {
                        *position1 += *speed1;
                      }
                      if(*speed2<0)
                      {
                        *position2 += *speed2;
                      }
                        --crash_time;
                      }
                      break;

        case CRASH : new_speed=((weight1**speed1)+(weight2**speed2))/
                                (weight1+weight2);



                     new_position = (*position1+(((*position2-*position1-1)/
                                    (*speed1-*speed2))**speed1));

                    if(*speed2>=0)
                    {
                        *position1 -= *speed1;
                    new_position = (*position1+(((*position2-*position1-1)/
                                    (*speed1-*speed2))**speed1))+1;
                    }

                    if(*speed1<=0)
                    {

                        new_position = *position1+0.5;
                    }
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                    if(new_speed<0)
                    {
                       end_time = new_position;
                       while(end_time>0)
                       {
                           print_game_state(*object1, new_position, *object2,
                           *position2, *game_state);
                           new_position += new_speed;
                           end_time += new_speed;
                       }
                    }

                    else if(new_speed>0)
                    {
                       end_time = WAY_END-new_position;
                       while(end_time>0)
                       {
                           print_game_state(*object1, new_position, *object2,
                           *position2, *game_state);
                           new_position += new_speed;
                           end_time -= new_speed;
                       }
                    }

                   else
                   {
                       print_game_state(*object1, new_position, *object2,
                       *position2, *game_state);
                   }
                    break;

        case END : break;
    }
}

/*************************************************************************
 * calculate all way                                                     *
 * sump up to pozitif speed1 and pozitif speed2                          *
 * way assign to temp_way                                                *
 * calculate (temp_way-sum up to speeds)                                 *
 * 1 add to car_crash_time                                               *
 * if sum up to speeds bigger than temp_way-sum                          *
 * return car_crash_time                                                 *
 *************************************************************************/
double car_crash_time(double position1, double position2, double speed1,
double speed2)
{
    double way,temp_way,car_crash_time=0,control_way;

    way = position2-position1-1;
    temp_way = way;

    if(speed1<0)
    {
        speed1=0;
    }


    if(speed2>0)
    {
        speed2=0;
    }

    while(temp_way>=-1)
    {
        ++car_crash_time;
        control_way=way;
        temp_way = control_way-(speed1-speed2);
        if(temp_way == way)
        {
            ++car_crash_time;
            return car_crash_time;
```

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        }
        way = temp_way;
    }

    return car_crash_time;

}

/**************************************************************************
 * until crash time:                                                      *
 * printf first_out_line,object1,in_line                                  *
 * printf object1,second_out_line.                                        *
 * after crash time:                                                      *
 * until end time                                                         *
 * printf first_out_line,X,second_out_line                                *
 **************************************************************************/
void print_game_state(char object1, double position1, char object2,
double position2, object_state game_state)
{
    double in_line,first_out_line,second_out_line;
    double temp_in_line,temp_first_out_line,temp_second_out_line;
    int ruler;

    switch(game_state){

        case PLAY : first_out_line = position1-1.9;
                    temp_first_out_line = first_out_line;
                    while(temp_first_out_line>0)
                    {
                      printf("_");
                      --temp_first_out_line;
                    }

                    printf("%c",object1);

                    in_line = position1-position2-0.9;
                    temp_in_line = in_line;
                    while(temp_in_line<-2)
                    {
                      printf("_");
                      ++temp_in_line;
                    }

                    printf("%c",object2);

                    second_out_line = WAY_END-position2-0.9;
                    temp_second_out_line = second_out_line;
                    while(temp_second_out_line>0)
                    {
                      printf("_");
                      --temp_second_out_line;
                    }

                    printf("\n");
                    for(ruler=1;ruler<(WAY_END/WAY_NUMBER+0.9);++ruler)
                    {
                        printf("1234567890");
                    }

                    printf("\n");
                    break;

        case CRASH :
                     first_out_line=position1-1;
                     temp_first_out_line = first_out_line;
                     while(temp_first_out_line>0)
                    {
                      printf("_");
                      --temp_first_out_line;
                    }

                    printf("X");
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                    second_out_line = WAY_END-position1+1;

                    temp_second_out_line = second_out_line;

                    while(temp_second_out_line>2)
                    {
                      printf("_");
                      --temp_second_out_line;
                    }

                        printf("\n");
                    for(ruler=1;ruler<(WAY_END/WAY_NUMBER+0.9);++ruler)
                    {
                        printf("1234567890");
                    }

                    printf("\n");
                    break;

        case END : break;
    }
}
/*##############################################################################*/
/*                            End of HW05_part1.c                               */
/*##############################################################################*/
```