```c
/*Proj_2C1_random_LEDs
*****************************************************************/

#include "Proj_2C1_header_file.h"

char display_bkp[7];                                          //One element to backup each segment letter

int main (void){
char segment=0, digit_num=0, seg_counter = 0,direction = 0;

setup_HW;
wdt_enable(WDTO_2S);                                         //WDT prevents display from being completed in either direction

I2C_Tx_any_segment_clear_all();                              //Initialise display

UCSR0B |= (1 << RXCIE0);                                      //Set Interrupt on key press (for test purposes only)
sei();                                                       //Global enable interrupt

while(1){                                                    //Generate pattern
while(seg_counter < 56){                                     //There are 56 segments in total
segment = (PRN_16bit_GEN (0)%7) + 'a';
digit_num = (PRN_16bit_GEN (0)%8);
                                                             //Continue statements skip back to the top of the while-loop
                                                             //This is to ensure segments are not turned-off before
                                                             //all have been turned on.

if ((!(direction)) && (display_bkp[segment - 'a'] & (1 << digit_num))) continue;
if ((direction) && (!(display_bkp[segment - 'a'] & (1 << digit_num)))) continue;

I2C_Tx_any_segment(segment, digit_num);                      //Update display
backup_the_display(segment, digit_num);                      //keep backup up to date
Timer_T0_10mS_delay_x_m(5);  wdr();                          //delay and reset watch dog
seg_counter += 1;}
direction ^= 1;                                              //Toggle the direction_counter value
seg_counter = 0;
Timer_T0_10mS_delay_x_m(100);}}                               //Just pause before toggling leds off one at a time


/*****************************************************************/
void backup_the_display(char segment, char digit_num){
display_bkp[segment - 'a'] = display_bkp[segment - 'a'] ^ (1 << digit_num);}


/*****************************************************************/
ISR(USART_RX_vect){receiveChar();
I2C_Tx_any_segment_clear_all();
sei();while(1);}
```