BLG 212E HW2 2024-2025

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For this homework, I implemented a bubble sort algorithm for a linked list and Systick functions for measuring time. I measured mergesort times for lists with different sizes and bubblesort times for lists with different sizes. My results can be seen below. S represents the length of the list. Time represents the mergesort time (in 10 nanoseconds) . Time_asm represents the bubblesort time (in 10 nanoseconds).

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	5	auto - uint
time_asm	2	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	5	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	14	auto - uint
time_asm	10	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	10	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	24	auto - uint
time_asm	24	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	15	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	34	auto - uint
time_asm	43	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	20	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	46	auto - uint
time_asm	70	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	25	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	57	auto - uint
time_asm	106	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	30	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	69	auto - uint
time_asm	145	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	35	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	82	auto - uint
time_asm	188	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	40	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	96	auto - uint
time_asm	238	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	45	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	111	auto - uint
time_asm	296	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	50	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	122	auto - uint
time_asm	349	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	55	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	137	auto - uint
time_asm	412	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	60	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	151	auto - uint
time_asm	497	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	65	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	165	auto - uint
time_asm	575	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	70	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	179	auto - uint
time_asm	647	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	75	auto - int

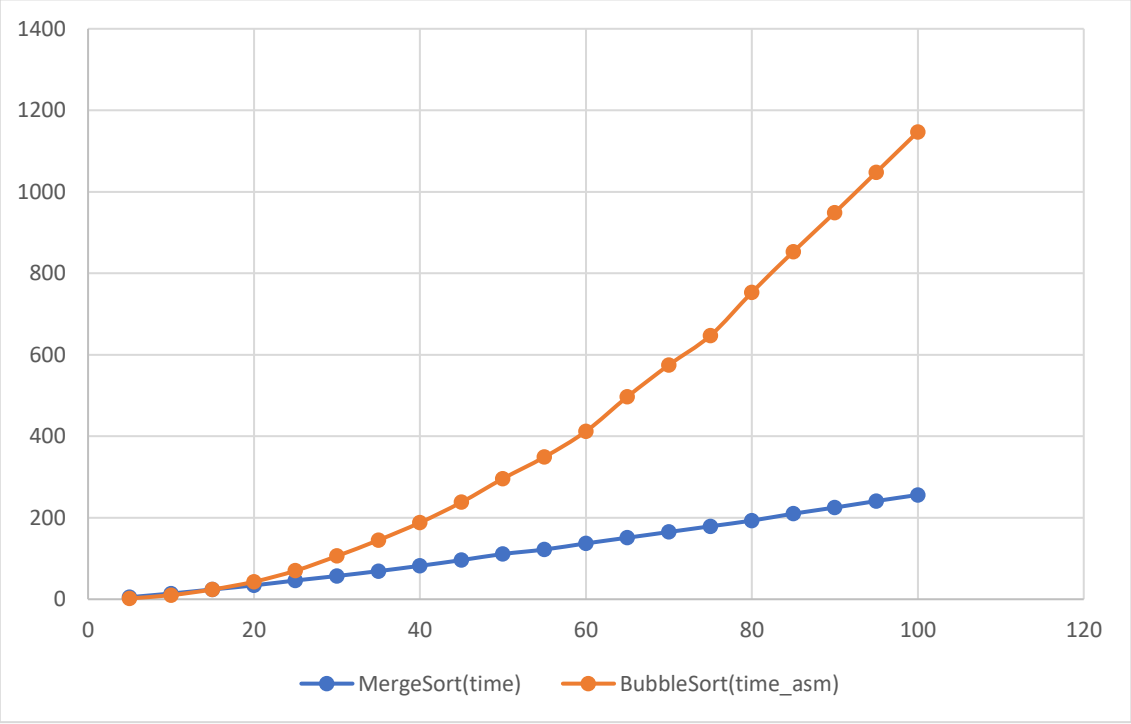
myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	193	auto - uint
time_asm	753	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	80	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	210	auto - uint
time_asm	853	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	85	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	225	auto - uint
time_asm	949	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	90	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	241	auto - uint
time_asm	1048	auto - uint
aux	0x20000004	auto - struct s_list *
num1	681	auto - int
num2	537133012	auto - int
s	95	auto - int

myMain	0x000004D0	int f(int,int *,struct s_li...
size	101	param - int
arr	0x00000590 x_array	param - int *
area	0x20000004	param - struct s_list *
time	256	auto - uint
time_asm	1147	auto - uint
aux	0x20000004	auto - struct s_list *
num1	42	auto - int
num2	42	auto - int
s	105	auto - int



Time complexity of mergesort is Onlogn. Time complexity of bubblesort is On^2. According to the graph we can clearly see that when the input size is increased, bubblesort time grows faster than mergesort time.