CSP740 : Software Engineering
Assignment - 2 Splint

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1 Question No. 3

S. No	Line No.	Error Name	Brief Explanation
		Errors in the function *int kbhit(void)*	
1	78	Undefined fields	Parameter **oldt** passed to the function **tcgetattr** contains 8 undefined fields.
2	78	Ignored return value	Return value from **tcgetattr** is ignored.
3	81	Ignored return value	Return value from **tcsetattr** is ignored.
4	82	Null storage as non-null parameter	In the function **fcntl**, null storage passed as non-null parameter.
5	83	Ignored return value	Return value from **fcntl** is ignored.
6	87	Ignored return value	Return value from **tcsetattr** is ignored.
7	88	Ignored return value	Return value from **fcntl** is ignored.
8	92	Ignored return value	Return value from **ungetc** is ignored.
		Errors in the function *int main()*	
9	110	Undefined fields	Parameter **snake_1** passed to the function **snake_init** contains 8 undefined fields.

10	111	Undefined fields	Parameter **pos1** passed to the function **pos_init** contains 2 undefined fields.
11	112	Undefined fields	Parameter **food1** passed to the function **food_init** contains 3 undefined fields.
12	117	Ignored return value	Return value from **system("clear")** is ignored.
13	118	Ignored return value	Return value from **system("stty -echo")** is ignored.
14	127	Ignored return value	Return value from **system("/bin/stty raw")** is ignored.
15	132	Type Mismatch	Operand of ! (not) is *non-boolean*, integer type-casted to be a boolean
16	137	Type Mismatch	Operand of ! (not) is *non-boolean*. **khbit** returns int, but operated by ! as boolean.
17	139	Type Mismatch	Function **usleep** expects arg1 to be *__useconds_t* but gets int.
18	139	Ignored return value	Return value from **usleep** is ignored.
19	141	Type Mismatch	Test expression for **if** is not boolean but int.
20	150	Type Mismatch	Assignment of int (return value **getchar**) to char (snake1.direction)
21	156	Ignored return value	Return value from **system("/bin/stty raw")** is ignored.
22	157	Ignored return value	Return value from **system("stty -echo")** is ignored.
23	158	Ignored return value	Return value from **system("clear")** is ignored.
			Errors in the function *void snake_init()*
24	174	Type Mismatch	Assignment of int (100) to char(snake1− >direction).
25	175	Type Mismatch	Assignment of int (115) to char(snake1− >prev_direction)
26	183	Inconsistent definition	Parameter **pos1** of *snake_place()* redeclared as possibly NULL storage, previously without NULL qualifier.
			Errors in the function *void snake_place()*

27	190	Dereferencing a possibly NULL pointer	Parameter **pos1** with null qualifier is dereferenced.
28	219	Inconsistent definition	Parameter **score** of *snake_move()* redeclared as possibly NULL storage

27	190	Dereferencing a possibly NULL pointer	Parameter **pos1** with null qualifier is dereferenced.
28	219	Inconsistent definition	Parameter **score** of *snake_move()* redeclared as possibly NULL storage
Errors in the function *void snake_move()*			
29	230	Dereferencing a possibly NULL pointer	Parameter **score** with null qualifier is dereferenced.
Errors in the function *void move_head()*			
30	263		
31	272	Type Mismatch	Comparison between a char and int
32	282		
33	292		
Functions exported but not used outside the file			
34	58		Function **snake_init**
35	59		Function **pos_init**
36	60		Function **food_init**
37	61	Function	Function **gotoxy**
38	62	exported but	Function **snake_place**
39	63	not used outside	Function **snake_move**
40	64	the file, should	Function **move_tail**
41	65	be declared with	Function **move_head**
42	66	static keyword	Function **food_print**
43	67		Function **game_over**
44	68		Function **set_borders**
45	72		Function **kbhit**
Library and Header file inclusion related			
46	9		
47	10	Include file matches the name of a POSIX library, but it is not being used.	
48	11		

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2 Question No. 4

S. No	Line No.	Error Name	Brief Explanation
1	9		
2	10	Include file matches the name of a POSIX library, but it is not being used.	
3	11		
4	58	Declaration paramter has name. This can interfere with macro definitions.	Parameter name **snake1** in **snake_init**
5	59		Parameter name **pos1** in **pos_init**
6	60		Parameter name **food1** in **food_init**
7	62		Parameter name **snake1** in **snake_place**
8	62		Parameter name **pos1** in **snake_place**
9	63		Parameter name **snake1** in **snake_move**
10	63		Parameter name **pos1** in **snake_move**
11	63		Parameter name **food1** in **snake_move**
12	64		Parameter name **snake1** in **move_tail**
13	64		Parameter name **pos1** in **move_tail**
14	65		Parameter name **snake1** in **move_head**
15	65		Parameter name **pos1** in **move_tail**
16	66		Parameter name **food1** in **food_print**
17	67		Parameter name **snake1** in **game_over**
18	67		Parameter name **pos1** in **game_over**
19	68	Function declaration without parameter	Function **set_borders** has no parameters.
In function *kbhit*			
20	78	Undefined fields	Parameter **oldt** passed to the function **tcgetattr** contains 8 undefined fields.
21	78	Undetected modifications possible	The function **tcgetattr** can modify parameters passed.
22	78	Ignored return value	The return value of **tcgetattr** is ignored.
23	80	Type Mismatch	Right value of & = operand is not unsigned int.
24	81	Undetected modifications possible	The function **tcsetattr** can modify parameters passed.
25	81	Ignored return value	The return value of **tcsetattr** is ignored.

26	82	Null storage as non-null parameter	In the function **fcntl**, null storage passed as non-null parameter.
27	82,83, 88	Undetected modifications possible	The function **fcntl** can modify parameters passed.
28	83	Type Mismatch	Left operand of | is not unsigned int.
29	83, 88	Ignored return value	The return value of **fcntl** is ignored.
30	85, 92	Function may access file state	The function **getchar()** can access file system state. It can cause undocumented modification of this state.
31	87	Undetected modifications possible	The function **tcsetattr** can modify parameters passed.
32	87	Ignored return value	The return value of **tcsetattr** is ignored.
33	92	Ignored return value	The return value of **ungetc** is ignored.
34	100	Function without parameter	The function **main** is defined without any parameters.
			In function *main*
35	110	Undefined fields	Parameter **snake_1** passed to the function **snake_init** contains 8 undefined fields.
36	110	Undetected modifications possible	The function **snake_init** can modify parameters passed.
37	110	Suspicious statement	The statement calling **snake_init** has no effect.
38	111	Undefined fields	Parameter **pos1** passed to the function **pos_init** contains 2 undefined fields.
39	111	Undetected modifications possible	The function **pos_init** can modify parameters passed.
40	111	Suspicious statement	The statement calling **pos_init** has no effect.
41	112	Undefined fields	Parameter **food1** passed to the function **food_init** contains 3 undefined fields.

42	112	Undetected modifications possible	The function **food_init** can modify parameters passed.
43	112	Suspicious statement	The statement calling **food_init** has no effect.
44	117	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.
45	117	Ignored return value	The return value of **system("clear")** is ignored.
46	118	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.
47	118	Ignored return value	The return value of **system("stty -echo")** is ignored.
48	120	Undetected modifications possible	The function **snake_place** can modify parameters passed.
49	120	Suspicious statement	The statement calling **snake_place** has no effect.
50	121	Undetected modifications possible	The function **set_borders** can modify parameters passed.
51	121	Suspicious statement	The statement calling **set_borders** has no effect.
52	122	Undetected modifications possible	The function **food_print** can modify parameters passed.
53	122	Suspicious statement	The statement calling **food_print** has no effect.
54	127	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.
55	127	Ignored return value	The return value of **system("/bin/stty raw")** is ignored.
56	132	Undetected modifications possible	The function **game_over** can modify parameters passed.

57	132	Type Mismatch	Operand of ! (not) is *non-boolean*, integer type-casted to be a boolean
58	137	Undetected modifications possible	The function **kbhit** can modify parameters passed.
59	137	Type Mismatch	Operand of ! (not) is *non-boolean*, integer type-casted to be a boolean
60	139	Undetected modifications possible	The function **usleep** can modify parameters passed.
61	139	Type Mismatch	Function **usleep** expects arg1 to be *__useconds_t* but gets int.
62	139	Ignored return value	The return value of **usleep** is ignored.
63	140	Undetected modifications possible	The function **snake_move** can modify parameters passed.
64	140	Suspicious statement	The statement calling **snake_move** has no effect.
65	141	Undetected modifications possible	The function **game_over** can modify parameters passed.
66	141	Type Mismatch	Test expression for **if** is not boolean but int.
67	143	Problematic Control flow	Break statement inside nested loop. Must check that break is intended to only break the inner loop.
68	137	Problematic Control flow	Suspected infinte loop since no condition values are modified.
69	150	Function may access file state	The function **getchar()** can access file system state. It can cause undocumented modification of this state.
70	150	Type Mismatch	Assignment of int (return value **getchar**) to char (snake1.direction)
71	132	Problematic Control flow	Suspected infinite loop since no condition values are modified. They maybe modified through unconstrained function calls.
72	156	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.

73	156	Ignored return value	The return value of **system(”/bin/stty cooked”)** is ignored.
74	157	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.
75	157	Ignored return value	The return value of **system(”stty echo”)** is ignored.
76	158	Function may access file state	The function **system()** can access file system state. It can cause undocumented modification of this state.
77	158	Ignored return value	The return value of **system(”clear”)** is ignored.
78	159	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
In function *snake_init*			
79	172	**Undocumented**	Modification of **snake1− >symbol**.
80	173	**modification**:	Modification of **snake1− >size**.
81	174	Externally visible	Modification of **snake1− >direction**.
82	175	object is	Modification of **snake1− >prev_direction**.
83	176	modified by a	Modification of **snake1− >tail_X**.
84	177	function with no	Modification of **snake1− >tail_Y**.
85	178	/*@modified@*/	Modification of **snake1− >head_X**.
86	179	annotation.	Modification of **snake1− >head_Y**.
87	174	Type Mismatch	Assignment of int (100) to char(snake1− >direction).
88	175	Type Mismatch	Assignment of int (115) to char(snake1− >prev_direction).
89	183	Inconsistent definition	Parameter **pos1** of *snake_place()* redeclared as possibly NULL storage, previously without NULL qualifier.
In function *snake_place*			
89	188	Undetected modifications possible	The function **gotoxy** can modify parameters passed.
90	188	Suspicious statement	The statement calling **gotoxy** has no effect.

91	189	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
92	190	Dereferencing a possibly NULL pointer	Parameter **pos1** with null qualifier is dereferenced.
93	190	**Undocumented modification**	Modification of **pos1− >X[i]**
94	191		Modification of **pos1− >Y[i]**
95	192		Modification of **snake1− >tail_X**
96	191	**Buffer over-flow vulnera-bility**	Possibly out-of-bounds store. To assign value to **pos1− >Y[i]**, it must have been allocated a buffer of size atleast $i + 1$.
In function *set_borders*			
97	202	Undetected modifications possible	The function **gotoxy** can modify parameters passed.
98	204		
99	210		
100	212		
101	202	Suspicious statement	The statement calling **gotoxy** has no effect.
102	204		
103	210		
104	212		
105	203	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
106	205		
107	211		
108	213		
109	219	Inconsistent def-inition	Parameter **score** of *snake_move()* redeclared as possibly NULL storage
In function *snake_move*			
110	221	Undetected modifications possible	The function **move_head** can modify parameters passed.
111	225		The function **move_tail** can modify parameters passed.
112	233		The function **food_print** can modify parameters passed.
113	221	Suspicious statement	The statement calling **move_head** has no effect.
114	225		The statement calling **move_tail** has no effect.
115	233		The statement calling **food_print** has no effect.
116	229		Modification of **snake1− >size**

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117	230	**Undocumented modification**	Modification of *score
118	231		Modification of **food1− >X**
119	232		Modification of **food1− >Y**
120	230	Dereferencing a possibly NULL pointer	Parameter **score** with null qualifier is dereferenced.
121	231	Function access internal state	The function **rand()** can access file system state. It can
122	232		cause undocumented modification of this state.
123	230	Buffer overflow	Possibly out-of-bounds store. To assign value to **score[0]**, it must have been allocated a buffer.
124	230	vulnerability	Possibly out-of-bounds read. To read value from **score[0]**, it must have been allocated a buffer.
In function *move_tail*			
125	244	Undetected modifications possible	The function **gotoxy** can modify parameters passed.
126	244	Suspicious statement	The statement calling **gotoxy** has no effect.
127	245	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
128	251	**Undocumented modification**	Modification of **pos1− >X[i]**
129	252		Modification of **pos1− >Y[i]**
130	244		Possibly out-of-bounds read. To read value from **pos1− >X[0]**, it must have been allocated a buffer.
		Buffer overflow	
131	244	vulnerability	Possibly out-of-bounds read. To read value from **pos1− >Y[0]**, it must have been allocated a buffer.
132	251		Possibly out-of-bounds read. To read value from **pos1− >X[i + 1]**, it must have been allocated a buffer of size atleast $i + 2$.
133	252		Possibly out-of-bounds read. To read value from **pos1− >Y[i + 1]**, it must have been allocated a buffer of size atleast $i + 2$.
134	252		Possibly out-of-bounds store. To assign value to **pos1− >Y[i]**, pos1 must have been allocated a buffer of size atleast $i + 1$.

In function _move_head_		
135 136 137 138	263 272 282 292	Type Mismatch	Comparison between a char and int
139 140 141 142	265 268 274 277	**Undocumented modification**	Modification of **snake1− >head_X**
143 144 145 146	284 287 294 297		Modification of **snake1− >head_Y**
147 148	307 308		Modification of **pos1− >X[]** Modification of **pos1− >Y[]**
149	310	Undetected modifications possible	The function **gotoxy** can modify parameters passed.
150	310	Suspicious state-ment	The statement calling **gotoxy** has no effect.
151	311	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
152	308	Buffer overflow vulnerability	Possibly out-of-bounds store. To assign value to **pos1− >Y[snake1− >size]**, it must have been allocated a buffer of size atleast $snake1− > size + 1$.
In function _food_init_		
153 154	318 319	Function access internal state	The function **rand()** can access file system state. It can cause undocumented modification of this state.
155 156 157	318 319 320	**Undocumented modification**	Modification of **food1− >X** Modification of **food1− >Y** Modification of **food1− >symbol**
In function _food_print_		
158	326	Undetected modifications possible	The function **gotoxy** can modify parameters passed.

159	326	Suspicious statement	The statement calling **gotoxy** has no effect.
160	327	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
In function *gotoxy*			
161	334	Function may access file state	The function **printf()** can access file system state. It can cause undocumented modification of this state.
In function *pos_init*			
162	341	Undocumented modification	Modification of ***pos1**
163	341	Buffer overflow vulnerability	Possibly out-of-bounds store. To assign value to **pos1**, it must have been allocated a buffer of size atleast **sizeof(*pos1)**
In function *game_over*			
164	351	Buffer overflow vulnerability	Possibly out-of-bounds read. To read value from **pos1− >X[i]**, it must have been allocated a buffer of size atleast $i + 1$.
165	351		Possibly out-of-bounds read. To read value from **pos1− >Y[i]**, it must have been allocated a buffer of size atleast $i + 1$.
166	69	Unused function	The function **print_score** is declared but not used.
167	58		Function **snake_init**
168	59		Function **pos_init**
169	60		Function **food_init**
170	61	Function	Function **gotoxy**
171	62	exported but	Function **snake_place**
172	63	not used outside	Function **snake_move**
173	64	the file, should	Function **move_tail**
174	65	be declared with	Function **move_head**
175	66	static keyword	Function **food_print**
176	67		Function **game_over**
177	68		Function **set_borders**
178	72		Function **kbhit**
179	58		Function **snake_init**
180	59		Function **pos_init**
181	60		Function **food_init**

182	61		Function **gotoxy**
183	62		Function **snake_place**
184	63	Function exported but not declared in the header file	Function **snake_move**
185	64		Function **move_tail**
186	65		Function **move_head**
187	66		Function **food_print**
188	67		Function **game_over**
189	68		Function **set_borders**
190	72		Function **kbhit**