HW2.3. Memory Alpha Model

Consider the following code:

```
#define SPOCK 1701
int KIRK = 1701;
int sulu(int scotty) {
    return scotty * scotty;
}
int main(int argc, char *argv[]) {
    int *chekov = malloc(sizeof(int) * 1701);
    if (chekov) free(chekov);
    sulu(SPOCK); // ← snapshot just before it returns
    return 0;
}
```

For each of the following symbols, choose what section of memory it would live in.

Q1.1: sulu

- (a) stack
- (b) heap
- (c) static/data
- (d) code

~ 100%

Q1.2: chekov

- (a) stack
- (b) heap
- (c) static/data
- (d) code

~ 100%

Q1.3: *chekov

- (a) stack
- (b) heap
- (c) static/data
- (d) code

~ 100%

Q1.4: KIRK

- (a) stack
- (b) heap
- (c) static/data
- (d) code

~100%

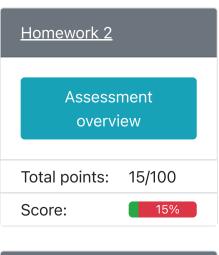
Q1.5: scotty

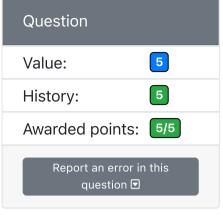
- (a) stack
- (b) heap
- (c) static/data
- (d) code

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Q1.6: On the line sulu(SPOCK);, where is SPOCK located?

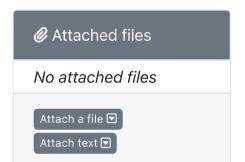
- (a) stack
- (b) heap
- (c) static/data
- (d) code





Previous question

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✓ 100%

Try a new variant

Correct answer

Q1.1: sulu

(d) code

Q1.2: chekov

(a) stack

Q1.3: *chekov

(b) heap

Q1.4: KIRK

(c) static/data

Q1.5: scotty

(a) stack

Q1.6: On the line sulu(SPOCK);, where is SPOCK located?

(d) code

Q1.1: sulu is a function, and therefore it is stored in the code.

Q1.2: The variable chekov itself is stored in the stack, since it's a local variable. Note that the value of chekov is a pointer elsewhere.

Q1.3: Since we set chekov to a pointer returned by <a href="mailto:mailt

Q1.4: KIRK is declared outside any function and is a variable, so it gets stored in the static/data segment.

Q1.5: scotty is a local variable (as a function argument) to the function sulu, so it gets stored on the stack. Note that the value of SPOCK gets copied into a new local variable, since C is pass-by-value.

Q1.6: SPOCK is a defined by a #define statement. Effectively, all instances of SPOCK get replaced with 1701 by the compiler before it continues to compile the code. As such, the value of SPOCK gets copied directly into the code.

Q1.3: *chekov

(b) heap < 100%

(a) stack < 100%

Q1.4: KIRK

(c) static/data 100%

Q1.5: scotty
(a) stack 100%

Q1.6: On the line sulu(SPOCK);, where is SPOCK located?

(d) code < 100%

Submitted answer 1 partially correct: 50%
Submitted at 2022-09-03 08:26:33 (PDT)