

Name: _____

CS 23200

Date: _____

Memory Management

Determine if the following code snippets are valid.

1.

```
int* getCubes(){
    int cubes[10];
    int i=1;
    for(i=1; i<=10; i++){
        cubes[i-1] = i * i * i;
    }
    return cubes;
}
```

2.

```
int* getAddress(int n){
    return &n;
}
```

3.

```
char* findSpace(char* str){
    const int n = strlen(str);
    int i;
    for(i=0; i<n; i++){
        if(str[i] == ' '){
            return &(str[i]);
        }
    }
    return NULL;
}
```

Determine if the heap is used correctly in the following code snippet.

```
int* getRange(const int lower, const int upper){
    int i;
    const int n = upper - lower + 1;
    int* array;

    if(n <= 0){
        return NULL;
    }

    array = malloc(sizeof(int) * n);
    if(array == NULL){
        fprintf(stderr, "Could not allocate memory\n");
        return NULL;
    }

    for(i=lower; i<=upper; i++){
        array[i-lower] = i;
    }

    return array;
}

int main(){
    const int lower = 20;
    const int upper = 100;
    int* array = getRange(lower, upper);
    int i;

    if(array != NULL){
        for(i=0; i<upper-lower+1; i++){
            printf("%d\n", array[i]);
        }
    }

    return 0;
}
```