**Problem 2. Answer each of the following tracing questions. If a question asks for a specific output, be sure to write single quotes to denote strings, brackets to denote vectors, and true/false to denote logical values. (25 points).**

A `1xN` structure is stored in the workspace, as the variable `in`. Before any code is executed, `in` will always begin with 4 fields: `Species`, `Color`, `HP`, and `Damage`.

Use the below test-case of `in` to solve the questions on the next page:

| | | | |
|---|---|---|---|
| Species | 'Dragon' | 'Unicorn' | 'Basilisk' |
| Color | 'Red' | 'Purple' | 'Blue' |
| HP | 9 | 10 | 10 |
| Damage | 9 | 6 | 8 |

The following function is saved in the current directory:

```
1 function out = creatureCards(in)
2 damages = [in.Damage];
3 for i = 1:length(in)
4     species = in(i).Species;
5     color = in(i).Color;
6     in(i).Name = [color ' ' species];
7 end
8 [~, ind] = sort(damages, 'descend');
9 out = in(ind);
10 rmfield(out, 'Species');
11 temp = rmfield(out, 'Color');
12 end
```

In the command window the following is run:

```
>> out = creatureCards(in)
```

**Multiple Choice**

1. What will be the length of `out` after the function is run?

a) 1
b) 2
c) 3
d) 4

2. What will be the class of `out` after the function is run?

a) `char`
b) `logical`
c) `struct`
d) `cell`

3. What will the value of `in(1).Name` be after the first iteration of the for-loop?

a) `'Dragon Red'`
b) `'Red Dragon'`
c) `' '`
d) `'Purple Unicorn'`

4. If the function is paused after the <u>first iteration</u> of the for-loop, what would the value of `in(2).Name` be?

a) `''`
b) `' '`
c) `'Purple Unicorn'`
d) `ERROR: Reference to non-existent field name`

5. What will the value of `out(2).Name` be after the function is run?

a) `'Blue Basilisk'`
b) `'Purple Unicorn'`
c) `'Basilisk Blue'`
d) `'Red Dragon'`

6. How many fields are in `out` after the function is run?

Number of Fields: _____

**Coding**

8. Add code below line 11 to remove all structures in `out` with an `HP` value equal to 10. (Write solution code in the white space below)

**SOLUTION**

**Problem 2. Answer each of the following tracing questions. If a question asks for a specific output, be sure to write single quotes to denote strings, brackets to denote vectors, and true/false to denote logical values. (25 points).**

A `1xN` structure is stored in the workspace, as the variable `in`. Before any code is executed, `in` will always begin with 4 fields: `Species`, `Color`, `HP`, and `Damage`.

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7 end
8 [~, ind] = sort(damages, 'descend');
9 out = in(ind);
10 rmfield(out, 'Species');
11 temp = rmfield(out, 'Color');
12 end
```

In the command window the following is run:

```
>> out = creatureCards(in)
```

**Multiple Choice**

1. What will be the length of `out` after the function is run?

e) 1
f) 2
**g) 3**
h) 4

2. What will be the class of `out` after the function is run?

e) `char`
f) `logical`
**g) `struct`**
h) `cell`

3. What will the value of `in(1).Name` be after the first iteration of the for-loop?

e) `'Dragon Red'`
**f) `'Red Dragon'`**
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4. If the function is paused after the first iteration of the for-loop, what would the value of `in(2).Name` be?

**e) `''`**
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h) `ERROR: Reference to non-existent field name`

5. What will the value of `out(2).Name` be after the function is run?

**e) `'Blue Basilisk'`**
f) `'Purple Unicorn'`
g) `'Basilisk Blue'`
h) `'Red Dragon'`

6. How many fields are in `out` after the function is run?

Number of Fields: _____**5**_____

**Coding**

8. Add code below line 11 to remove all structures in `out` with an `HP` value equal to 10. (Write solution code in the white space below)

```
hps = [out.HP];
mask = hps == 10;
out(mask) = [];
```