

CMSC 433

Name: _____

Fall 2017

UMBC User Name: _____

Final

Time Limit: 120 Minutes

This exam contains 8 pages (including this cover page) and 25 questions. There are a total of 100 points. Use the back page if you need more room for your answers. Describe any assumptions you make in solving a problem. We reserve the right to assign partial credit, and to deduct points for answers that are needlessly wordy.

Grade Table (for instructor use only)

Question	Points	Score	Question	Points	Score
1	2		14	2	
2	8		15	4	
3	3		16	6	
4	3		17	5	
5	4		18	2	
6	4		19	2	
7	4		20	5	
8	4		21	5	
9	4		22	5	
10	4		23	5	
11	5		24	2	
12	5		25	3	
13	4		Total:	100	

Warm Up

1. (2 points) What language below was **NOT** covered this semester?
 - A. Lua
 - B. Bash
 - C. R
 - D. PHP
 - E. JavaScript

2. The next 4 questions ask you to name the language you think would be most appropriate for the task described. You can only use a language name once.
 - (a) (2 points) What language might you select to write a program that takes in data from the UMBC registrar, and graphs the popularity of majors over the years?

 - (b) (2 points) What language might you select to write a program that moves and archives all your files from GL to your backup server before graduation?

 - (c) (2 points) What language might you select to write a website that allows the user to delete unwanted portions of the page?

 - (d) (2 points) What language might you select to write a website that allows the user to buy an RV?

Regular Expressions

3. (3 points) Write a regular expression to match a Maryland license plate number issued between 2004 and 2010, which had the format of a single number followed by two upper case letters, a space for the state shield, followed by one more upper case letter and finally two digits.

Example: 1AA A11

4. (3 points) What is the value of the second capture group when the following regex is used to match the phrase “Jeremiah was a bullfrog”?

```
/(\w+) (was/is) a (\w+)/
```

5. (4 points) What is the result of applying the following substitution regex to the string “I have CMSC 433 every Thursday”.

```
s/^(.*?)\shave(.*?)$/$1 had $2/
```

Bash

6. (4 points) What is the bash code to print the second element of an array, when the array is declared as:

```
my_nums=(10 20 30 40 50)
```

7. (4 points) When will the following code print the statement “Inside main”

```
if [[ $0 == "main.sh" ]]; then  
    echo "Inside main"  
else  
    echo "How did I get here?"  
fi
```

8. (4 points) How would you call the function defined below so that a new directory named "dir10" is created?

```
function makeDir() {  
    mkdir "${1}${2}"  
}
```

9. (4 points) What does the following code output, in a general sense?

```
mystery=$(pwd)  
echo "${mystery}/stuff"
```

10. (4 points) What is the following code doing?

```
ls | sort | head -n1
```

R

11. (5 points) What is the difference between the data structures of a list and a vector in R?

12. (5 points) Given the following data.frame, named `bond.films` represented as a table, what is printed out by the following code?

Movie	Year	Oscars
Spectre	2015	1
Skyfall	2012	2
Quantum of Solace	2008	0
Casino Royale	2006	0

```
print(bond.films[bond.films$Oscars > 0]$Movie)
```

13. (4 points) What is the output of the following R code?

```
m = matrix(c(1,2,3,4,5,6),nrow=2)  
print(m ** 2)
```

14. (2 points) Which of the choices is the following code equivalent to?

```
data %>% groupby(names)
```

A. `groupby(names) <- data`
B. `groupby(data, names)`
C. `data = groupby(names)`
D. `groupby(names = data)`

15. (4 points) What is the output of the following R code?

```
`baz<-`<- function(x,y) {  
  x[1] <- y  
  x  
}  
  
var <- c(10,9,8,7,6)  
baz(var) <- 20  
print(var)
```

JavaScript

16. (6 points) Which of the following events indicate whether a selected input currently is being interacted with or not? (Select all that apply)

- A. active
- B. blur
- C. focus
- D. inactive
- E. interaction

17. (5 points) What does the following code cause to happen?

```
<p id="here"></p>  
<script>  
var s = "";  
var arr = [10,20,30,40];  
for(let x of arr){  
  s += " " + x  
}  
document.getElementById("here").innerHTML = s;  
</script>
```

18. (2 points) Which of the following causes Bee to inherit from Insect?
- A. Bee.prototype = Insect;
 - B. Bee extends Insect;
 - C. Bee = new Insect();
 - D. Bee = {super:Insect};
19. (2 points) Name one function used to get DOM elements besides getElementById().
20. (5 points) Write the JSON for an array of 2 objects, where each object has an id, a color, and a height. The actual values of those keys for each object are up to you and don't really matter.

PHP

21. (5 points) What is the output of the following code?

```
$units = array('temperature' => 'celcius',
              'mass' => 'grams',
              'length' => 'meters');

foreach($units as $x => $y){
    echo $x . " is measured in " . $y;
    echo "\n";
}
```

22. (5 points) What is the output of the following piece of code?

```
$var = "hello!";  
echo "It is polite to say $var" . ' It is polite to say $var';
```

23. (5 points) What variables in PHP do you need to access in order to process the following AJAX call?

```
xhr = new XMLHttpRequest();  
xhr.open('POST', "process.php");  
xhr.send("request=1234&day=Thursday");
```

24. (2 points) What is the output of the following code?

```
$greeting = "hello";  
$leaving = "goodbye";  
$event = "greeting";  
echo $$event;
```

25. (3 points) Name one function used to read files in PHP.