

Sample CS8 Midterm Exam Questions

1. Write a function that determines if a number is even or odd. Use the number, **n**, as the parameter to the function. Additionally, write a for-loop that tests out this function as it calls it using all integer numbers between 4 and 12 (inclusive). Make sure you clearly show the needed tabbed spaces.
2. Write a function that takes in 2 integers, **width** and **height**, and draws a rectangle with twice those parameters. Additionally, show how you would call this function with an example using the values 4 for **width** and 6 for **height**. You have to use the **turtle** module and at least one for loop to get full credit. Make sure you clearly show the needed tabbed spaces.

3. What is the exact output of this Python code?

```
for m in (1, 8, 2):  
    print (m)
```

4. What is the exact output of this Python code?

```
s = 0  
m = 20  
for p in range(10, 30, 3):  
    if p < m:  
        s = s - p  
    else:  
        s = s + p  
print (s)
```

5. What is the exact output of this Python code?

```
a = 10  
b = 20  
c = 5  
if (a/c) >= (b/a):  
    print ((b % c) != (a - 2*c))  
else:  
    print ((c ** 2)/a > 0)
```

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6. Repeat problem #5, but with `c = 10`.
7. Consider a string `FullName` set to `'Jimbo Jones'`, what is the value of the following strings?
 - a. `FullName.count('j')`
 - b. `FullName.count('J')`
 - c. `FullName.find('e')`
 - d. `FullName.replace('J', ' ')`
 - e. `(FullName[3:7].lower() + "ack").replace(' ', '')`
8. Consider a string `character` set to `'z'` and an integer `code` set to `3` what is the value of the following?
 - a. `ord(character) - ord('y')`
 - b. `chr(ord(character) - code)`
9. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Write Python code that can find the sum of all the multiples of 3 or 5 below 1000.
10. The sum of the squares of the first ten natural numbers is:
 $1^2 + 2^2 + \dots + 10^2 = 385$.
The square of the sum of the first ten natural numbers is:
 $(1 + 2 + \dots + 10)^2 = 55^2 = 3025$
Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is $3025 - 385 = 2640$.
Write Python code that can find the difference between the sum of the squares of **the first one hundred** natural numbers and the square of their sum.
11. Write a function `Encode(s)` that takes a string `s` and changes each of its letters (characters) into a letter that is 3 places ahead in the alphabet (per the ASCII code), and returns that new string. For example, if `s = 'friend'`, `Encode(s)` would be `'iu1hqg'`. If you always want `Encode(s)` to be made up of alphabet characters, what limitation does that place on string `s`?