

# CSE 111 3. Midterm

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## I. QUESTION (20 POINTS)

Write a method which takes an integer array  $a$  and an integer  $x$  as a parameter and returns the value

$$a[0]x^0 + a[1]x^1 + a[2]x^2 + \dots$$

```
int sumOfArray(int[] a, int x)
```

You must also write and use the power function (You can not use `Math.pow`)

```
int power(int x, int y)
```

which calculates  $x^y$ .

```
sumOfArray({1, 2, 3}, 2) -> 17
sumOfArray({1, 1, 1, 1}, 3) -> 40
```

## II. QUESTION (15 POINTS)

Write a method, which takes an integer  $n$  as a parameter and returns true if the digits of  $n$  are strictly increasing or returns false otherwise.

```
boolean increasingDigits(int n)
increasingDigits(137) -> true
increasingDigits(1344567) -> false
increasingDigits(12345671) -> false
```

## III. QUESTION (15 POINTS)

Write a method which takes a string  $s$  as a parameter and returns the number of vowels in that string.

```
int numberOfVowels(String s)
numberOfVowels("alitopuat") -> 5
numberOfVowels("mxyzptlk") -> 0
```

## IV. QUESTION (20 POINTS)

Write a method, which doubles the size of an array of integers by replacing every integer in the array with two of that integer.

```
int[] stutter(int[] list)
stutter({1, 8, 19, 4, 17}) -> {1, 1, 8, 8, 19, 19, 4, 4, 17, 17}
stutter({2, 4, 5}) -> {2, 2, 4, 4, 5, 5}
```

## V. QUESTION (15 POINTS)

Write a recursive method

```
int sumOfTriples(int N)
```

which calculates

$$1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \dots + (N-1) \times N \times (N+1)$$

```
sumOfTriples(2) -> 6
sumOfTriples(4) -> 90
```

## VI. QUESTION (15 POINTS)

Write a recursive method, which takes a string as a parameter and returns recursively a new string where all the 'x' chars have been removed.

```
String noX(String str)
```

```
noX("xaxb") -> "ab"
noX("abc") -> "abc"
noX("xx") -> ""
```