Week 4: Assignment 4

Your last recorded submission was on 2024-08-12, 18:59 IST Due date: 2024-08-21, 23:59 IST.

1) Which of the following options provides the general formula for the magic constant of a magic square of size n, where all elements are distinct numbers from 1 to n^2? ***1 point***

- [x] $\frac{n(n^2+1)}{2}$
- [ ] $\frac{n^3}{2}$
- [ ] $\frac{n^3+2}{2}$
- [x] $\frac{n^4+n^2}{2n}$

2) What would the magic constant be for a magic square of size 6, given that all elements in the square are distinct numbers from 1 to 36? ***1 point***

- ○ 72
- ◉ 111
- ○ 109
- ○ 110

3) Does transposing the magic square give us a new magic square ? ***1 point***

- ◉ Yes
- ○ No

4) Which of the following are valid magic squares ? ***1 point***

- [x] $\begin{bmatrix} 10 & 3 & 13 & 8 \\ 5 & 16 & 2 & 11 \\ 4 & 9 & 7 & 14 \\ 15 & 6 & 12 & 1 \end{bmatrix}$
- [ ]

$$\begin{bmatrix} 20-e & 6-e & 26-e & 16-e \\ 10-e & 32-e & 4-e & 22-e \\ 8-e & 18-e & 14-e & 28-e \\ 30-e & 12-e & 24-e & 2-e \end{bmatrix}$$

- [x] $$\begin{bmatrix} 1 & 14 & 4 & 15 \\ 8 & 11 & 5 & 10 \\ 13 & 2 & 16 & 3 \\ 12 & 7 & 9 & 6 \end{bmatrix}$$

- [x] $$\begin{bmatrix} \pi & 14\pi & 4\pi & 15\pi \\ 8\pi & 11\pi & 5\pi & 10\pi \\ 13\pi & 2\pi & 16\pi & 3\pi \\ 12\pi & 7\pi & 9\pi & 6\pi \end{bmatrix}$$

5) What is the minimum number of people required to ensure that at least two of them share the same 30-minute birth interval? The intervals start from 12:00 AM and each interval lasts for half an hour.

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1 point

6) Calculate the magic constant for 4x4 square, where all elements are distinct numbers from 1 to 16, is it same as the magic constant for Ramanujan's magic square ?

If yes, enter 0, else enter the absolute difference between the two.
Hint: Search the about Ramanujan's magic square.

105

1 point

7) What task does function1() perform ? ***1 point***

```
def function1(number):
    list1 = []
    for i in range(1, number):
        if number % i == 0:
            list1.append(i)
    return list1


def function2(n1, n2):
    flag = False
    list2 = []
    for i in function1(n1):
        for j in function1(n2):
            if i == j:
                flag = True
                list2.append(i)
    if len(list2) > 0:
        print("Completed")
```

- ○ Calculate factorial of number n.
- ○ Calculate factors of number n.
- ○ Calculate prime factors of number n.
- ◉ Calculate factors of number n excluding n.

8) For what **n1,n2** flag will the variable **flag** inside **function2()** be not equal to true ? ***1 point***

- ☐ 2,3
- ☑ 0,0
- ☑ 1,1
- ☑ 1,0

9) If all possible pairs of prime numbers between 0 and 20, are given to n1 and n2, for how many pairs would function2 print ”Completed” ? ***1 point***

- ○ It will not print ”Completed” for any pair.
- ○ It will print ”Completed” only for pairs (2,3)(3,5),(2,5), and for the remaining it would not print ”Completed”.
- ○ It will print ”Completed” only for pair (2,3), and for the remaining other pairs of primes it would not print ”Completed”.
- ◉ It will print ”Completed” for all pairs of primes between 0 and 20.

10) If numbers of pairs of primes which result in function2 to print ”Completed” are greater than 0, Can we edit the code in **function2()** so that ”Completed” is never printed for any pair of primes ? ***1 point***

- ○ Yes, we can change the logic for setting **flag** variable to True.
- ◉ Yes, we can change/increase the threshold for length of **list2** in the last **if** block.
- ○ No, it is logically not possible.

Yes, we can change the initial value of flag to True, instead of False.

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers