Homework - 2

IC100 Introduction To Programming

Question 1

Write a C program to find the sum of all numbers divisible by 17 within 100 to 999. It is easy with the modulus(%) operator. Can you do it without using the modulus operator?

Question 2

Write a C program to find the GCD of two given numbers. Assume both the numbers to be distinct integers and greater than 1.
Sample Input 0
81
153
Sample Output 0
9
Sample Input 1
35
21
Sample Output 1
7

Question 3

Write a C program to take a number as input and check if it is a perfect number or not. A perfect number is equal to the sum of all its factors except itself. For example, 6 is a perfect number as $6 = 1 + 2 + 3$.
Assume the input to be a non-zero positive integer. Your program should output "Perfect" if the number is perfect; otherwise, output "Not Perfect".
Sample Input 0
28
Sample Output 0
Perfect
as $(28 = 1 + 2 + 4 + 7 + 14)$
Sample Input 1

21
Sample Output 1
Not Perfect
as ((21 $\neq$ 1 + 3 + 7))

Question 4

Write a C program that takes a positive integer n and prints a triangle like this: (given example for n = 5)

```
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```

Question 5

Write a C program that takes a positive integer n and prints a pattern like this: (given example for n = 4)

```
#            #
 ##        ##
  ###    ###
   ########
   ########
  ###    ###
 ##        ##
#            #
```

Question 6

Write a C program that takes a positive integer n and prints the first n^2 prime numbers in a square. (given example for n = 5)
Note that its perfectly fine if the output is not exactly a square. It just needs

```
2 3 5 7 11
13 17 19 23 29
31 37 41 43 47
53 59 61 67 71
73 79 83 89 97
```

to have n primes in each row.

Question 7

Given two positive integers a and b ($a \leq b \leq 1000$), find the number of pairs (i, j) ($a \leq i \leq j \leq b$) such that i divides j.

Sample Input 0

1
10

Sample Output 0

27

Sample Input 1

1
1000

Sample Output 1

7069

Question 8

Given a positive integer n ($n \leq 100$), find the number of positive integers less than or equal to n, that are expressible as sum of squares of two (not necessarily distinct) non-negative integers a and b.

Sample Input 0

5

Sample Output 0

4

as $1= 0^2 + 1^2$, $2=1^2 + 1^2$, $4= 0^2 + 2^2$, $5= 1^2 + 2^2$

Sample Input 1

50

Sample Output 1

24

Submission

Please submit your homework in piazza under hw2 folder and make it a private submission to the instructors. Zip all the codes and name the zip as yourname_rollno
Submission deadline is 8:00pm Dec 3.