Assignment 1

For each value of n given $10^4 < n < 10^6$:

Group - 4

Q1. Check if n is prime. Plot time constant in graph and list time constant values for
   a. Best case
   b. Average case
   c. Worst case

Group - 3

Q2. If n is not prime, locate the nearest prime number.

Group - 25

Q3. Check if n is a Fibonacci number. Plot time constant in graph and list time constant values for
   a. Best case
   b. Average case
   c. Worst case

Group - 10

Q4. If n is not a Fibonacci number, find the nearest Fibonacci number.

Group - 15

Q5. Check if n is an exact square number (without using sqrt function).

Group - 23

Q6. Check whether n is Pythagorean hypotenuse.

For all 2, 3 digit positive integers N (9 < N < 1000):

Group - 11

Q7. Check if N is of the form: $d1^2 + d2^2 + d3^2 = N$
Where, d1, d2, d3 are the digits of the number N. Plot time constant in graph.

Group - 13

Q8. Check if N is an Armstrong number of the form: $d1^3 + d2^3 + d3^3 = N$
Where, d1, d2, d3 are the digits of the number N. Plot time constant in graph.

For all 4 digit positive integers N (999 < N < 10,000):

Group - 16

Q9. Decompose N such that N = n1 + n2,
Where, n1 is the largest possible prime number. Repeat using recursion until n2 is prime.
Plot graph showing time constant and recursion depth for each number N.

Group - 18

Q10. Consider Q9 for Fibonacci Numbers.

Group - 20

Q11. For all 4 – 7 digit positive integers N check whether N can be partitioned into two subsets (may be unequal) such that sum of subsets is same.

Group - 26

Q12. Check whether a 4 – 7 digit positive integer N is having unique partitions (as described in Q10). List all such possible partitions.

Group - 7

Q13. Assume 7 English alphabets including exactly 2 vowels. Check how many valid English words can be constructed.

Group - 21

Q14. Let N be an integer number. Check if mid two digits and extreme two digits (for both ends where applicable) make a prime number or not. For example if N = 214678 = 21 46 78 then sum(21) = **3**, sum(46) = sum(10) = **1**, sum(78) = sum(15) = **6**, and further check whether any permutations of 1, 3, and 6 make a prime number or not.

Group - 14

Q15. Consider Q14 to check Fibonacci Numbers.

Group - 11

Q16. Consider Q14 to check for perfect square numbers.

Group - 24

Q17. Consider Q14 to check for Pythagorean numbers.

Group - 8

Q18. Let N be an integer number. Decompose it into mid two digits and extreme two / one digits (for both ends where applicable) make a right angled triangle or not.

Group - 9

Q19. Take a 5 digit number, make 3 partitions and check whether it is a Pythagorean triplet. If not, define nearly Pythagorean. Check how nearly it is right-angled. Check for all possible partitions.

Given an array of randomly generated positive integers of size 1000 such that, $10^4 < A[i] < 10^6$ for any i, where 1 <= i <= 1000.

Group - 18

Q20. Locate the smallest Prime number.

Group - 19

Q21. Locate the smallest Fibonacci number.

Group - 2

Q22. Locate the smallest Pythagorean number.

Group - 27

Q23. Locate the smallest perfect square.

Group - 1

Q24. Find the largest and smallest Prime number.

Group - 12

Q25. Find the largest and smallest Fibonacci number.

Group - 5

Q26. Find the largest and smallest Pythagorean number.

Group - 6

Q27. Find the largest and smallest perfect square.