



Midterm 1 (CSE115.12 – Asif Ahmed Neloy_Fall'19)

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Time 60 minutes, Marks 100 (You need to answer all questions).

Note - You have to name variable according to Questions and requirements. For example – you have to write `int source_distance = 0`, instead of `int a = 0`;

1. Anik is coming to NSU from Uttara. Uttara is his source index and NSU is the destination index. In his way, there are some checkpoints like Airport, Khilkheta and Kuril. Suppose distance from Uttara to other destination are following –

Uttara to Airport – n_0

Airport to Khilkheta – n_1

Khilkheta to Kuril – n_2

Kuril to NSU – n_3

You have to find the maximum distance from each checkpoint. You can take an array of n_{th} elements and then find maximum distance from each distance. Write a C program to illustrate this situation and find the maximum distance from this array of distance.

2. Again, consider the above question. In your previous question you have only got the largest distance. **Now write another program to calculate the minimum, average, total distance within the range.**

3. Saif is investigating an interesting number (integer). This interesting positive integer is equal to the sum of its proper divisors. For example – if the interesting number is 6, which is the sum of 1, 2, and 3. Other interesting numbers are 28, 496, and 8,128. The discovery of such numbers is lost in prehistory. It is known, however, that the Pythagoreans (founded c. 525 BCE) studied perfect numbers for their “mystical” properties. **Write a C program for Saif to implement his research.**

4. Unlike Saif, Ridwan is also researching another mysterious number. This mystique number is a whole number greater than 1 whose only factors are 1 and itself. To make you clearer, follow the chart given below-

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Now, write a C program to print all the numbers with bold color, from 1 to 100.

5. Iftekhar is going to Bandarban. One of his fantasy is the hiking of tall hills and terrace. Before hiking he is mapping the hill. A sample structure of the hill is given below - The hill has maximum height of 8 meters. The hill is structured as a pyramid. **Now write a C program to print the structure of the hill.**