Topics:
Bonus - 10 questions

A4.1
Ugly numbers are numbers whose only prime factors are 2, 3 or 5.

a. Write a program to find whether an input number is ugly or not.
b. Extend the program to print all the ugly numbers between 1 and 1000.

A4.2
Write a program to find the values of nCr and nPr, given n and r as input.

A4.3
Read the definition of Catalan numbers from here, and write a program to print the first 10 catalan numbers.

A4.4
Take two strings as input from the user. Both strings are in the format HH:MM:SS, hence they represent times. Calculate and print the difference between the first and second time values.
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A4.5
Write a program to get the indices of the two numbers of a given array of integers, such that the sum of the two numbers equal to a specific target.
Example.
Original Array: 4 2 1 5
Target Value: 7
Indices of the two numbers whose sum equal to target value: 7
1 3

A4.6
Write a program to generate all permutations of the first 6 numbers.

A4.7
Given a number N as input, check whether N is prime or not.

A4.8
Given a number N as input, find and print the N^{th} prime number.
Example. 1001^{th} prime number is 7927.

A4.9
Write a function that can add 5 to an integer variable.
You can use the following code structure:

```
#include<stdio.h>
void add_five (/*write your parameters*/)
{
        //write you function definition here
}
int main ()
{
        int val = 10;
        printf (“%d \n”, val); //this will print 10
        //call the add_five function here
        printf (“%d \n”, val); //this should print 15
        return 0;
}
```

A4.10
Understand the following program and explain what it does.

```
#include<stdio.h>
typedef struct
{
	int max;
	int min;
	float mean;
}three_vals;

three_vals compute (int *arr, int size)
{
	three_vals ret;
	int i;
	int max = arr[0], min = arr[0], sum = 0;
	for (i=0; i<size; i++)
	{
		if (*(arr+i) > max)
			max = arr[i];
		else if (*(arr+i) < min)
			min = arr[i];

		sum += arr[i];
	}
	ret.max = max;
	ret.min = min;
	ret.mean = (float)sum/size;

	return ret;
}

int main ()
{
	int arr[10] = {10,11,12,14,16,15,18,17,27};
	three_vals tv;

	tv = compute (arr, 10);
	printf ("max = %d, min = %d, mean = %f\n", tv.max, tv.min, tv.mean);
	return 0;
}
```

Modify the above program such that the function can also compute and return the standard deviation of the array.

Hint: You will need to make modifications to the function, structure and the print statement.