Functions
(Assignment Questions)

Question 1 : Write a function to check if a number is a palindrome in C++.
(121 is a palindrome, 321 is not)

A number is called a palindrome if the number is equal to the reverse of a number.
Eg : 121 is a palindrome because the reverse of 121 is 121 itself. On the other hand, 321 is not a palindrome because the reverse of 321 is 123, which is not equal to 321.

Question 2 : Write a function to calculate the sum of digits of a number.

Question 3 : Write a function which takes 2 numbers as parameters (a & b) and outputs : $a^2 + b^2 + 2ab$.

Question 4 : Write a function that prints the largest of 3 numbers.

Question 5 : Write a function that accepts a character (ch) as parameters & returns the character that occurs after ch in the English alphabet.
Eg : input = 'c', return value = 'd'

Note : for ch = 'z', return 'a'.

Functions
(Assignment Solutions)

Question 1 :

```cpp
int reverse(int n) {
    int res = 0;
    while(n > 0) {
        int lastDig = n % 10;
        res = res*10 + lastDig;
        n = n/10;
    }
    return res;
}


bool isPalindrome(int num) {
    int revNum = reverse(num);
    return num == revNum;
}
```

Question 2 :

```cpp
int digSum(int n) {
    int res = 0;

    while(n > 0) {
        res += n % 10;
        n = n/10;
    }
    return res;
}
```

Question 3 :

```cpp
int abSquare(int a, int b) {
    return a*a + b*b + 2*a*b;
}
```

Question 4 :

```
int largest(int a, int b, int c) {
    if(a >= b && a >= c) {
        return a;
    } else if(b >= c) {
        return b;
    } else {
        return c;
    }
}
```

Question 5 :

```
char getNextChar(char ch) {
    if(ch == 'z') {
        return 'a';
    } else {
        return ch + 1;
    }
}
```

Vectors
(Assignment Questions)

Question 1 : You have a set of integers, which originally contains all the numbers from 1 to n. Unfortunately, due to some error, one of the numbers in s got duplicated to another number in the set, which results in repetition of one number and loss of another number.

You are given an integer array nums representing the data status of this set after the error.

Find the number that occurs twice and the number that is missing and return them in the form of an array. [Go to Qs]

Example :

Input: nums = [1,2,2,4]
Output: [2,3]

Question 2 : You are given an integer array height of length n. There are n vertical lines drawn such that the two endpoints of the ith line are (i, 0) and (i, height[i]).

Find two lines that together with the x-axis form a container, such that the container contains the most water. Return the maximum amount of water a container can store.

Notice that you may not slant the container. [Go to Qs]

Input: height = [1,8,6,2,5,4,8,3,7]
Output: 49
Explanation: The above vertical lines are represented by array [1,8,6,2,5,4,8,3,7]. In this case, the max area of water (blue section) the container can contain is 49.

Question 3 : Given an integer array nums, return all the triplets [nums[i], nums[j], nums[k]] such that i != j, i != k, and j != k, and nums[i] + nums[j] + nums[k] == 0.

Notice that the solution set must not contain duplicate triplets. [Go to Qs]

Input: nums = [-1,0,1,2,-1,-4]
Output: [[-1,-1,2],[-1,0,1]]
Explanation:
nums[0] + nums[1] + nums[2] = (-1) + 0 + 1 = 0.
nums[1] + nums[2] + nums[4] = 0 + 1 + (-1) = 0.
nums[0] + nums[3] + nums[4] = (-1) + 2 + (-1) = 0.
The distinct triplets are [-1,0,1] and [-1,-1,2].
Notice that the order of the output and the order of the triplets does not matter.

Input: nums = [0,1,1]
Output: [ ]
Explanation: The only possible triplet does not sum up to 0.

Note - Read up about the in-built sorting of vectors.