

Q1:

Code:

```
#include<stdio.h>

// Function to generate passwords recursively
void generatepasswords(char password[], int used[], int index) {
    static char letters[] = "abcdefghijklmnopqrstuvwxyz"; // Array of lowercase letters
    int i;

    if (index == 4) { // Base case: If the password length is 4, print the password and return
        printf("%s\n", password);
        return;
    }

    for (i = 0; i < 26; i++) { // Iterate through each letter
        if (!used[i]) { // Check if the letter is already used
            password[index] = letters[i]; // Add the letter to the password
            used[i] = 1; // Mark the letter as used
            generatepasswords(password, used, index + 1); // Recursive call to generate the next
            character
            used[i] = 0; // Backtrack: Mark the letter as unused for the next iteration
        }
    }
}

int main() {
    char password[5]; // Array to store the generated password
    int used[26] = {0}; // Array to keep track of used letters, initialized to 0
```

```
generatepasswords(password, used, 0); // Call the function to generate passwords
return 0;
}
```

Screenshot of output:

```
zyvw  
zyvx  
zywa  
zywb  
zywc  
zywd  
zywe  
zywf  
zywg  
zywh  
zywi  
zywj  
zywk  
zywl  
zywm  
zywn  
zywo  
zywp  
zywq  
zywr  
zyws  
zywt  
zywu  
zywv  
zywx  
zyxa  
zyxb  
zyxc  
zyxd  
zyxe  
zyxf  
zyxg  
zyxh  
zyxi  
zyxj  
zyxk  
zyxl  
zyxm  
zyxn  
zyxo  
zyxp  
zyxq  
zyxr  
zyxs  
zyxt  
zyxu  
zyxv  
zyxw  
user1@lamp ~$
```

Screenshot of Bash command.:

```
user1@lamp: /home/user1
zywa
zywb
zywc
zywd
zywe
zywf
zywg
zywh
zywi
zywj
zywk
zywl
zywm
zywn
zywo
zywp
zywq
zywr
zyws
zywt
zywu
zywv
zywx
zyxa
zyxb
zyxc
zyxd
zyxe
zyxf
zyxg
zyxh
zyxi
zyxj
zyxk
zyxl
zyxm
zyxn
zyxo
zyxp
zyxq
zyxr
zyxs
zyxt
zyxu
zyxv
zyxw
user1@lamp ~$ ./a.out | wc -l
358800
user1@lamp ~$
```