**Program 1**

#include <iostream>

#include <string>

#include <cstdlib>

#include <ctime>

using namespace std;

static const char genalpha[] = "ABCDEFGHIJKLMNOPQRSTUVWXYZ" "abcdefghijklmnopqrstuvwxyz";

static const char genNum1[] = "0123456789";

int len = sizeof(genalpha) - 1;

int len1 = sizeof(genNum1) - 1;

char genEmail(int a) {

for(int z = 1; z < a; z++) {

cout << genalpha[rand() % len];

}

}

char genNum(){

cout << genNum1[rand() % len1];

}

char genEmail2(int a) {

for(int z = 0; z < a; z++) {

cout << genalpha[rand() % len];

}

}

char genUrl(){

srand(time(0));

string urls[] = {"com", "net", "org"};

string url = "";

for(int i = 0; i < 3; i++)

{

url = urls[rand() % 3];

}

cout << url;

}

int main()

{

int n, i = 0;

srand(time(0));

cout << "Enter string length: ";

cin >> n;

while(i < 100)

{

genEmail(n);

genNum();

cout << ".";

genEmail(n);

genNum();

cout << "@";

genEmail2(n);

cout << ".";

genUrl();

cout << endl;

i++;

}

}

**Program 2 (Algorithm)**

Step 1: Construct an array to hold all uppercase, lowercase letters.

Step 2: Construct an array to hold numbers from 0-9.

Step 3: Initialize q with value 5.

Step 4: Input n from user.

Step 5: Randomly choose letters n time.

Step 6: Randomly select a number one time.

Step 7: cout a dot”.”.

Step 8: Randomly choose letters n time.

Step 9: Randomly select a number one time.

Step 10: cout “@”.

Step 11: Randomly choose letter q times.

Step 12: cout a dot”.”.

Step 13: Randomly select “com”, “net” or “org” from the given array.

Step 14: End.

**Program 3 - 4 (print 100, 100,000, 500,000 & Search)**

#include <iostream>

#include <string>

#include <cstdlib>

#include <ctime>

using namespace std;

static const char genalpha[] = "ABCDEFGHIJKLMNOPQRSTUVWXYZ" "abcdefghijklmnopqrstuvwxyz";

static const char genNum1[] = "0123456789";

int len = sizeof(genalpha) - 1;

int len1 = sizeof(genNum1) - 1;

char genEmail(int a) {

for(int z = 1; z < a; z++) {

cout << genalpha[rand() % len];

}

}

char genNum(){

cout << genNum1[rand() % len1];

}

char genEmail2(int a) {

for(int z = 0; z < a; z++) {

cout << genalpha[rand() % len];

}

}

char genUrl(){

string urls[] = {"com", "net", "org"};

string url = "";

for(int i = 0; i < 3; i++)

{

url = urls[rand() % 3];

}

cout << url;

}

char genone(int n)

{

genEmail(n);

genNum();

cout << ".";

genEmail(n);

genNum();

cout << "@";

genEmail2(n);

cout << ".";

genUrl();

cout << endl;

}

int main()

{

int n, i = 0, j = 0, k = 0;

int choice1, count = 0;

static const char found[] = "vNFg8.XmFL0@wcLcz.org" "hRqI0.VELr4@ZjNAo.org" "wJlx1.NdKD4@ItDGz.com" "DFaM7.sTnv4@TSQyW.com" "QCPf6.zhUt3@iSjkB.com" "sDy2.zmz9@AqsN.org" "ebA1.RWK8@ljxB.net" "vev5.OPF5@DRXw.org" "rlk9.msT0@dgAn.net" "lTE8.JiH3@aVIy.org";

static const char notfound[] = "Lrcg0.npYE3@ocIDQ.org" "PJyF6.PWKU7@efNKO.net" "ZRHG6.EiWY5@PouLM.com" "FWrx8.wwdS7@zfvwz.net" "XVBh9.przM1@IxJag.org" "yzo7.koP8@glpZ.net" "pHG5.TPR4@GcPL.org" "nXa1.ulu9@YIWx.net" "mJF1.oqo7@ZLxq.org" "nrS6.was6@nuvE.org";

srand(time(0));

cout << "Enter Email length: ";

cin >> n;

cout << "\n\*\*\*Generating Set A (100)\*\*\*\n" << endl;

while(i < 100) //Set A

{

genone(n);

if(found[i] == genone(n)){

count = 1;

}

i++;

}

cout << "\n\*\*\*\*\*Do you want to search Set A or print Set B?\*\*\*\*\*\n\n";

while(true)

{

cout << "For Search Select\t\t = 1 \nFor Set B (100,000) Select\t = 2 \nExit to Set C (500,000) Select\t = 3\n";

cin >> choice1;

if(choice1 == 1){

if(count == 1){

cout << "Can't be found as the chances of finding similar value in the random array of alphanumeric string is astronimical" << endl;

}

else{

cout <<"\nNOT FOUND\n\n";

}

}

else if(choice1 == 2){

cout << "\n\*\*\*\*\*Generating Set B (100,000)\*\*\*\*\*\n" << endl;

while(j < 100000) //Set B

{

genEmail(n);

genNum();

cout << ".";

genEmail(n);

genNum();

cout << "@";

genEmail2(n);

cout << ".";

genUrl();

cout << "\t" << j << endl;

j++;

}

j = 0;

cout << endl;

}

else if(choice1 == 3){

break;

}

else{

cout << "\nYou entered the wrong number, Try Again.\n\n";

}

}

cout << "\nGenerating Set C" << endl;

while(k < 500000) //Set C

{

genEmail(n);

genNum();

cout << ".";

genEmail(n);

genNum();

cout << "@";

genEmail2(n);

cout << ".";

genUrl();

cout << "\t" << k << endl;

k++;

}

}