DA-2

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1ST

#include <stdio.h>

int count = 0;

void divide(int arr[], int start, int end) {

if (start == end) {

return;

}

int mid = (start + end) / 2;

divide(arr, start, mid);

divide(arr, mid+1, end);

count++;

}

int main() {

int arr[] = {1, 2, 3, 4, 5, 6, 7, 8};

int n = sizeof(arr) / sizeof(arr[0]);

divide(arr, 0, n-1);

printf("Number of iterations: %d\n", count);

return 0;

}

2ND

#include <stdio.h>

#include <string.h>

int main() {

char str[100];

int uppercase\_count = 0, lowercase\_count = 0, digit\_count = 0, whitespace\_count = 0, special\_count = 0;

printf("Enter a string: ");

fgets(str, 100, stdin);

for (int i = 0; str[i] != '\0'; i++) {

if (isupper(str[i])) {

uppercase\_count++;

printf("%c - Uppercase Alphabet\n", str[i]);

} else if (islower(str[i])) {

lowercase\_count++;

printf("%c - Lowercase Alphabet\n", str[i]);

} else if (isdigit(str[i])) {

digit\_count++;

printf("%c - Digit\n", str[i]);

} else if (isspace(str[i])) {

whitespace\_count++;

printf("%c - Whitespace\n", str[i]);

} else {

special\_count++;

printf("%c - Special Symbol\n", str[i]);

}

}

printf("Uppercase Alphabet count: %d\n", uppercase\_count);

printf("Lowercase Alphabet count: %d\n", lowercase\_count);

printf("Digit count: %d\n", digit\_count);

printf("Whitespace count: %d\n", whitespace\_count);

printf("Special Symbol count: %d\n", special\_count);

return 0;

}

3RD

#include <stdio.h>

double factorial(int n) {

if (n == 0) {

return 1;

} else {

return n \* factorial(n - 1);

}

}

int main() {

int n;

double sum = 0;

printf("Enter the value of n: ");

scanf("%d", &n);

for (int i = 1; i <= n; i++) {

sum += factorial(i) / i;

}

printf("The sum of the series is %.2lf\n", sum);

return 0;

}

4TH

#include <stdio.h>

#include <string.h>

int main() {

char car\_type[10];

float car\_price, extra\_fitting\_price, discount = 0, gst, total, net;

printf("Enter the type of car (Hatchback/Sedan/SUV/MUV): ");

scanf("%s", car\_type);

printf("Enter the price of the car: ");

scanf("%f", &car\_price);

printf("Enter the extra fitting price of the car: ");

scanf("%f", &extra\_fitting\_price);

total = car\_price + extra\_fitting\_price;

if (strcmp(car\_type, "Hatchback") == 0) {

discount = total \* 0.03;

} else if (strcmp(car\_type, "Sedan") == 0) {

discount = total \* 0.05;

} else if (strcmp(car\_type, "SUV") == 0) {

discount = total \* 0.10;

} else if (strcmp(car\_type, "MUV") == 0) {

discount = total \* 0.15;

} else {

printf("Invalid Type\n");

return 0;

}

gst = (total - discount) \* 0.12;

net = total - discount + gst;

printf("Net amount to be paid: %.2f\n", net);

return 0;

}

5TH

#include <stdio.h>

#include <math.h>

int isPrime(int num);

int isArmstrong(int num);

int isPerfect(int num);

int main()

{ int num;

printf("Enter any number: ");

scanf("%d", &num);

if(isPrime(num))

{

printf("%d is Prime number.\n", num);

}

else

{

printf("%d is not Prime number.\n", num);

}

if(isArmstrong(num))

{

printf("%d is Armstrong number.\n", num);

}

else

{

printf("%d is not Armstrong number.\n", num);

}

if(isPerfect(num))

{

printf("%d is Perfect number.\n", num);

}

else

{

printf("%d is not Perfect number.\n", num);

}

return 0;

}

int isPrime(int num)

{

int i;

for(i=2; i<=num/2; i++)

{

if(num%i == 0)

{

return 0;

}

}

return 1;

}

int isArmstrong(int num)

{

int lastDigit, sum, originalNum, digits;

sum = 0;

originalNum = num;

digits = (int) log10(num) + 1;

while(num > 0)

{

lastDigit = num % 10;

sum = sum + round(pow(lastDigit, digits));

num = num / 10;

}

return (originalNum ==sum);

}

int isPerfect(int num)

{

int i, sum, n;

sum = 0;

n = num;

for(i=1; i<n; i++)

{

if(n%i == 0)

{

sum += i;

}

}

return (num == sum);

}

6TH

#include <stdio.h>

#include<string.h>

int main() {

char line[150];

int vowels, consonant, digit, space,special;

vowels = consonant = digit = space =special= 0;

printf("Enter a line of string: ");

fgets(line, sizeof(line), stdin);

for (int i = 0; line[i] != '\0'; ++i) {

line[i] = tolower(line[i]);

if (line[i] == 'a' || line[i] == 'e' || line[i] == 'i' ||

line[i] == 'o' || line[i] == 'u') {

++vowels;

}

else if ((line[i] >= 'a' && line[i] <= 'z')) {

++consonant;

}

else if (line[i] >= '0' && line[i] <= '9') {

++digit;

}

else if (line[i] == ' ') {

++space;

}

else{

special++;

}

}

printf("Vowels: %d", vowels);

printf("\nConsonants: %d", consonant);

printf("\nDigits: %d", digit);

printf("\nWhite spaces: %d", space);

printf("\nSpecial characters: %d",special);

return 0;

}

7TH

#include <stdio.h>

#include <string.h>

struct Employee {

char name[100];

int age;

char position[100];

char date\_of\_joining[11];

};

void sort\_by\_name(struct Employee arr[], int n) {

int i, j;

struct Employee temp;

for(i=0; i<n-1; i++) {

for(j=i+1; j<n; j++) {

if(strcmp(arr[i].name, arr[j].name) > 0) {

temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

}

}

}

void sort\_by\_date(struct Employee arr[], int n) {

int i, j;

struct Employee temp;

for(i=0; i<n-1; i++) {

for(j=i+1; j<n; j++) {

int year1, month1, day1, year2, month2, day2;

scanf(arr[i].date\_of\_joining, "%d/%d/%d", &day1, &month1, &year1);

scanf(arr[j].date\_of\_joining, "%d/%d/%d", &day2, &month2, &year2);

if(year1 > year2 || (year1 == year2 && month1 > month2) || (year1 == year2 && month1 == month2 && day1 > day2)) {

temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

}

}

}

int main() {

int n, i;

printf("Enter the number of employees: ");

scanf("%d", &n);

struct Employee arr[n];

for(i=0; i<n; i++) {

printf("Enter details of employee %d:\n", i+1);

printf("Name: ");

scanf("%s", arr[i].name);

printf("Age: ");

scanf("%d", &arr[i].age);

printf("Position: ");

scanf("%s", arr[i].position);

printf("Date of joining (dd/mm/yyyy): ");

scanf("%s", arr[i].date\_of\_joining);

}

printf("\nEmployee List sorted by name:\n");

sort\_by\_name(arr, n);

for(i=0; i<n; i++) {

printf("\nName: %s\nAge: %d\nPosition: %s\nDate of Joining: %s\n", arr[i].name, arr[i].age, arr[i].position, arr[i].date\_of\_joining);

}

printf("\nEmployee List sorted by date of joining:\n");

sort\_by\_date(arr, n);

for(i=0; i<n; i++) {

printf("\nName: %s\nAge: %d\nPosition: %s\nDate of Joining: %s\n", arr[i].name, arr[i].age, arr[i].position, arr[i].date\_of\_joining);

}

return 0;

}

8TH

#include <stdio.h>

#include <string.h>

int main() {

char str[100];

int len, freq[26] = {0}, i, rep\_index = -1, non\_rep\_index = -1;

printf("Enter a string: ");

scanf("%s", str);

len = strlen(str);

printf("Length of the string is: %d\n", len);

for (i = 0; i < len; i++) {

freq[str[i] - 'A']++;

}

printf("Word frequency is: %d\n", len);

for (i = 0; i < len; i++) {

if (freq[str[i] - 'A'] == 1) {

non\_rep\_index = i;

break;

} else if (freq[str[i] - 'A'] > 1 && rep\_index == -1) {

rep\_index = i;

}

}

if (rep\_index == -1) {

printf("No repeated characters found in the string.\n");

} else {

printf("First repeated character is: %c\n", str[rep\_index]);

}

if (non\_rep\_index == -1) {

printf("No non-repeated characters found in the string.\n");

} else {

printf("First non-repeated character is: %c\n", str[non\_rep\_index]);

}

return 0;

}

9TH

#include <stdio.h>

int main() {

int chennai\_temps[7];

int delhi\_temps[7];

int haveri\_temps[7];

int gangtok\_temps[7];

int i;

printf("Enter the temperature for each day in Chennai:\n");

for (i = 0; i < 7; i++) {

scanf("%d", &chennai\_temps[i]);

if (chennai\_temps[i] < 28 || chennai\_temps[i] > 33) {

printf("Invalid temperature for Chennai. Please enter again.\n");

i--;

}

}

for (i = 0; i <7; i++) {

delhi\_temps[i] = chennai\_temps[i] - 8;

haveri\_temps[i] = chennai\_temps[i] + 5;

}

for (i = 0; i < 7; i++) {

gangtok\_temps[i] = haveri\_temps[i] - delhi\_temps[i];

}

printf("Temperature for each day in Gangtok:\n");

for (i = 0; i < 7; i++) {

printf("%d ", gangtok\_temps[i]);

}

printf("\n");

return 0;

}

10TH

#include <stdio.h>

int sum\_of\_digits(int num) {

int sum = 0;

while (num > 0) {

sum += num % 10;

num /= 10;

}

return sum;

}

int main() {

int start\_num, max\_num, sum, lucky\_num;

printf("Enter a four-digit even number: ");

scanf("%d", &start\_num);

if (start\_num < 1000 || start\_num > 9998 || start\_num % 2 != 0) {

printf("Error: Invalid input. Please enter a four-digit even number.\n");

return 0;

}

max\_num = 9998;

sum = 0;

for (int i = start\_num; i <= max\_num; i += 2) {

sum += i;

}

while (sum > 9) {

sum = sum\_of\_digits(sum);

}

if (sum % 2 != 0) {

lucky\_num = sum;

printf("Lucky number is: %d\n", lucky\_num);

} else {

printf("Sum of digits is even. Trying next even four-digit number...\n");

main();

}

return 0;

}

11TH

#include <stdio.h>

#include <string.h>

int main() {

char password[] = "aeiceg";

char input[3][3];

char diagonal[4];

int i, j;

printf("Enter 3x3 matrix of characters:\n");

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

for (j = 0; j < 3; j++) {

scanf(" %c", &input[i][j]);

}

}

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

diagonal[i] = input[i][i];

diagonal[3 + i] = input[3 - 1 - i][i];

}

diagonal[3 \* 2] = '\0';

if (strcmp(diagonal, password) == 0) {

printf("Password verified successfully.\n");

} else {

printf("Incorrect password.\n");

}

return 0;

}

12TH

#include <stdio.h>

int main() {

int original\_marks[25], revised\_marks[25], birth\_months[25], i;

float original\_marks\_avg = 0, revised\_marks\_avg = 0;

printf("Enter the original marks and birth month (as a number from 1 to 12) for %d students:\n", CLASS\_SIZE);

for (i = 0; i < 25; i++) {

printf("Student %d: ", i+1);

scanf("%d %d", &original\_marks[i], &birth\_months[i]);

}

for (i = 0; i < 25; i++) {

revised\_marks[i] = original\_marks[i] + birth\_months[i];

original\_marks\_avg += original\_marks[i];

revised\_marks\_avg += revised\_marks[i];

}

original\_marks\_avg /= 25;

revised\_marks\_avg /= 25;

if (revised\_marks\_avg - original\_marks\_avg >= 5) {

printf("Can implement - Significant increase in class average\n");

} else {

printf("Need not implement - No significant increase in class average\n");

}

return 0;

}

13TH

#include <stdio.h>

#include<math.h>

int power(int x, int n);

int main() {

int x, n, result;

printf("Enter the value of x: ");

scanf("%d", &x);

printf("Enter the value of n (<=5): ");

scanf("%d", &n);

result = power(x, n);

printf("%d^%d = %d\n", x, n, result);

return 0;

}

int power(int x, int n) {

if (n == 0) {

return 1;

} else if (n == 1) {

return x;

} else if (n % 2 == 0) {

int temp = power(x, n/2);

return temp \* temp;

} else {

return x \* power(x, n-1);

}

}

14TH

#include <stdio.h>

double factorial(int n) {

if (n == 0) {

return 1;

} else {

return n \* factorial(n - 1);

}

}

int main() {

int n;

double sum = 0;

printf("Enter the value of n: ");

scanf("%d", &n);

for (int i = 1; i <= n; i++) {

sum += factorial(i) / i;

}

printf("The sum of the series is %.2lf\n", sum);

return 0;

}

15TH

#include <stdio.h>

#include<string.h>

int main() {

char line[150];

int vowels, consonant, digit, space,special;

vowels = consonant = digit = space =special= 0;

printf("Enter a line of string: ");

fgets(line, sizeof(line), stdin);

for (int i = 0; line[i] != '\0'; ++i) {

line[i] = tolower(line[i]);

if (line[i] == 'a' || line[i] == 'e' || line[i] == 'i' ||

line[i] == 'o' || line[i] == 'u') {

++vowels;

}

else if ((line[i] >= 'a' && line[i] <= 'z')) {

++consonant;

}

else if (line[i] >= '0' && line[i] <= '9') {

++digit;

}

else if (line[i] == ' ') {

++space;

}

else{

special++;

}

}

printf("Vowels: %d", vowels);

printf("\nConsonants: %d", consonant);

printf("\nDigits: %d", digit);

printf("\nWhite spaces: %d", space);

printf("\nSpecial characters: %d",special);

return 0;

}