# TEMPLATE

CÁC BÀI TẬP CƠ BẢN

**Giải phương trình bậc 2.**

A09. Nhập 3 số thực a,b,c rồi giải và biện luận phương trình bậc 2 ax2 + bx + c = 0 .

#include <stdio.h> #include <math.h>

float a,b,c,d,x1,x2;

main()

{

printf("Nhap a= "); scanf("%f",&a);

printf("Nhap b= "); scanf("%f",&b);

printf("Nhap c= "); scanf("%f",&c);

d=b\*b-4\*a\*c;

if(d<0) printf("Vo nghiem");

if(d==0) printf("Pt co 1 nghiem = %.2f", -b/(2\*a) ); x1=(-b-sqrt(d))/(2\*a);

x2=(-b+sqrt(d))/(2\*a);

if(d>0) printf("Pt co 2 nghiem, x1=%.2f, x2=%.2f",x1,x2);

}

========================================================

Tình tiền điện

D06. Lập chương trình tính tiền điện cho khách hàng giá điện tính theo KW như sau:

|  |  |  |
| --- | --- | --- |
| **W =w1+w2+w3+w4** | **Điện tiệu thụ (KW)** | **Giá (đồng)** |
| w1 | 0-100 | 500 / KW |
| w2 | 101-150 | 550/ KW |
| w3 | 151 – 200 | 600 / KW |
| w4 | > 200 | 650/ KW |

#include<stdio.h>

main()

{

int w,t;

printf("Nhap so dien = "); scanf("%d",&w); if(w<=100) t=500\*w;

if((w<=150)&&(w>100)) t=500\*100+550\*(w-100); if((w>150)&&(w<=200)) t=500\*100+550\*50+600\*(w-150); if(w>200) t=500\*100+550\*50+600\*50 +650\*(w-200);

printf("Tien dien la: %d",t);

}

========================================================

//C20. Hay viet ham tinh tong cac chu so cua mot so nguyen bat ky.

// Vi du: So 8545604 co tong cac chu so la: 8+5+4+5+6+0+4= 32

#include <stdio.h>

main()

{

int a,s=0; printf("Nhap so: ");

scanf("%d",&a);

while(a!=0)

{

s=s+a%10; a=a/10;

}

printf("\nTong cac chu so s= %d",s);

}

========================================================

//A10. Viet chuong trinh C giai bai toan sau:

//tram trau tram co, trau dung an 5, trau nam an 3,

//lu khu trau gia, ba con an 1. Hoi co bao nhieu trau dung,

//bao nhieu trau nam va bao nhieu trau gia?

#include <stdio.h>

main()

{

int i,j,k; for(i=0;i<=100;i++)

for(j=0;j<=100;j++)

for(k=0;k<=100;k++)

if((i+j+k==100)&&(15\*i+9\*j+k==300))

printf("\nCo %d trau dung, %d trau nam, %d trau gia",i,j,k);

}

========================================================

/\*

Tim cac uoc so cua n

\*/

#include <stdio.h>

main()

{

int i,c=0,n;

printf("Nhap n = "); scanf("%d",&n);

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

{

if(n%i==0) {printf("\n%d",i); c++;}

}

printf("\nCo %d uoc so.",c);

}

========================================================

Tìm ước số chung lớn nhất: CHƯƠNG TRÌNH CON:

// USCLN - viet chuong trinh con

#include<stdio.h>

int USCLN(int n, int m)

{

int i; i=m;

while((m%i!=0)||(n%i!=0))i--;

return i;

}

main()

{

int m,n,s;

printf("Nhap n = "); scanf("%d",&n);

printf("Nhap m = "); scanf("%d",&m); s=USCLN(n,m);

printf("USCLN = %d",s);

}

========================================================

Chương trình tính giai thừa: (CHÚ Ý KHÔNG DÙNG HÀM TÍNH GIAI THỪA CHO CÁC BÀI TÍNH DÃY SỐ NHÉ, SẼ BỊ TRÀN)

/\*

Tinh giai thua

\*/

#include <stdio.h> main()

{

int n,i,s=1;

printf("Nhap n = "); scanf("%d",&n);

for(i=1;i<=n;i++) s=s\*i;

printf("%d! = %d",n,s);

}

========================================================

/\*1A. Viet chuong trinh nhap vao 3 so nguyen

va sap xep theo thu tu lon nhat – nho nhat – so o giua. Vi du: nhap vao 3 so: 5, 7 va 3

In ra man hinh la:

Ban vua nhap vao 3 so: 5 7 3

Sau khi sap xep la: 7 3 5

\*/

#include <stdio.h>

main()

{

int a,b,c,t;

printf("Nhap a b c: "); scanf("%d%d%d",&a,&b,&c); printf("\nBan vua nhap vao: %d %d %d",a,b,c);

if(a<b) { t=a; a=b; b=t; }

if(a<c) { t=a; a=c; c=t; }

if(b>c) { t=b; b=c; c=t; }

printf("\nSau khi sap xep: %d %d %d",a,b,c);

}

========================================================

/\*2. Viet chuong trinh nhap vao 3 ky tu in thuong va doi thanh 3 chu in hoa.

Vi du: nhap vao 3 ky tu son In ra man hinh:

Ban vua nhap vao 3 ky tu: son Sau khi chuyen doi la: SON

\*/

#include <stdio.h>

main()

{

char x,y,z;

printf("Nhap ky tu thu nhat: "); scanf("%c",&x); fflush(stdin); printf("Nhap ky tu thu hai: "); scanf("%c",&y); fflush(stdin); printf("Nhap ky tu thu ba: "); scanf("%c",&z); fflush(stdin);

printf("\nBan vua nhap vao: %c%c%c",x,y,z);

printf("\nSau khi chuyen doi la: %c%c%c",x-32,y-32,z-32);

}

========================================================

/\*3. Viet chuong trinh nhap vao 1 ky tu la chu cai in hoa, in thuong hoac so.

Kiem tra xem ky tu vua nhap la chu cai in hoa, in thuong, la mot so hay ky tu dac biet (khong phai la chu cai hay so). Vi du:

Nhap ‘b’ se thong bao la: Ban vua nhap vao chu in thuong Nhap ‘E’ se thong bao la: Ban vua nhap vao 1 ky tu in hoa Nhap ‘7’ se thong bao la: Ban vua nhap vao mot so.

Nhap ‘/’ se thong bao la: Ban vua nhap vao mot ky tu dac biet

\*/

#include <stdio.h>

main()

{

char x;

printf("Nhap 1 ky tu: "); scanf("%c",&x);

if((x>='a')&&(x<='z')) printf("\nBan vua nhap vao chu in thuong"); if((x>='A')&&(x<='Z')) printf("\nBan vua nhap vao chu in hoa"); if((x>='0')&&(x<='9')) printf("\nBan vua nhap vao 1 so");

else printf("\nBan vua nhap 1 ky tu dac biet");

}

========================================================

/\*

Tinh lai suat 5% / nam

\*/

#include <stdio.h>

main()

{

int N; float t;

printf("Nhap so tien: "); scanf("%f",&t);

printf("Nhap so nam: N= "); scanf("%d",&N);

for(int i=1; i<=N; i++) t=t+0.05\*t;

printf("\nSo tien sau %d nam la: %.2f",N,t);

}

========================================================

//4. Tim tat ca cac so co 3 chu so abc sao cho tong lap phuong

//cua cac chu so thi bang chinh so do, nghia la:

// abc = a^3 + b^3 + c^3

//Co bao nhieu so nhu vay?

#include <stdio.h>

main()

{

int a,b,c,n,i=0;

for(a=1;a<=9;a++)

for(b=0;b<=9;b++)

for(c=0;c<=9;c++)

{

n=100\*a+10\*b+c; if(n==a\*a\*a+b\*b\*b+c\*c\*c)

{

printf("\nSo can tim la: %d",n); i++;

}

}

printf("\n\nTim duoc %d so thoa man dieu kien de bai",i);

}

========================================================

// Nhap m, tim n de s=1+2+..+n <m

#include<stdio.h> main()

{

int n,m,i,s;

printf("Nhap m= "); scanf("%d",&m); i=1; s=0;

while(s+i<m)

{

s=s+i; i=i+1;

}

n=i-1;

printf("s=%d",s);

printf("\nn=%d",n);

}

========================================================

// Nhap n, viet ct con kiem tra xem co phai so nguyen to khong

#include<stdio.h>

int ktsonguyento(int n)

{

int check=1; // check=0 - ko la so nguyen to va nguoc lai if(1==n||0==n) check=0;

for(int i=2;i<=n-1;i++) if(n%i==0) check=0; return check;

}

main()

{

int n, check,i;

printf("Nhap n = "); scanf("%d",&n);

check=ktsonguyento(n);

if(check==0) printf("%d ko la so nguyen to",n); else printf("%d la so nguyen to",n);

}

========================================================

// Tim so nguyen to m dau tien > n; vi du n =8 thi m=11.

#include<stdio.h>

int ktsonguyento(int n)

{

int check=1; // check=0 - ko la so nguyen to va nguoc lai if(1==n||0==n) check=0;

for(int i=2;i<=n-1;i++) if(n%i==0) check=0; return check;

}

main()

{

int m,n,i,check=0;

printf("Nhap n = "); scanf("%d",&n); m=n;

while(!check)

{

m++;

check=ktsonguyento(m);

}

printf("m = %d",m);

}

========================================================

Đếm tổng có bao nhiêu số nguyên tố:

int ktsonguyento(int n)

{

int check=1; // check=0 - ko la so nguyen to va nguoc lai if(1==n||0==n) check=0;

for(int i=2;i<=n-1;i++) if(n%i==0) check=0; return check;

}

main()

{

int m,n,i,count=0,check=0; printf("Nhap n = "); scanf("%d",&n); count=0;

m=2;

while(m<n)

{

check=ktsonguyento(m); if(check==1)

{

count++; check=0; printf("\n%d",m);

}

m++;

}

printf("\nTong cac so nguyen to = %d",count);

}

========================================================

Mệnh giá tiền:

/\*

To hop 20.000 10.000 5.000 2.000 thanh 30.000

\*/

#include<stdio.h> main()

{

int i,j,k,l,c=0;

printf("Co cac to hop nhu sau\n"); printf("\t20.000\t10.000\t5.000\t2.000\n"); printf("\t "); for(i=0;i<=2;i++)

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

for(k=0;k<=6;k++)

for(l=0;l<=15;l++)

if(i\*20000+j\*10000+k\*5000+l\*2000==30000)

{

printf("\n\t%d\t%d\t%d\t%d",i,j,k,l); c++;

}

printf("\n\nCo %d to hop",c);

}

========================================================

========================================================

**DÃY SỐ**

========================================================

A01. Nhập số tự nhiên n rồi tính tổng (lưu ý phép chia các số nguyên):

S =1+

1 1 1

2 + 3 +...+ *n*

#include <stdio.h>

main()

{

int n,i; float s;

printf("Nhap so n= "); scanf("%d",&n);

i=1; s=0;

while(i<=n)

{

s=s+(float)1/i; i=i+1;

} printf("\nTong day so la: s= %f",s);

}

Cách 2:

#include <stdio.h>

main()

{

int n,i; float s;

printf("Nhap so n= "); scanf("%d",&n);

s=0;

for(i=1;i<=n;i++) s=s+(float)1/i;

printf("\nTong day so la: s= %f",s);

}

========================================================

/\*A02. Nhap so tu nhien n roi tinh cac tong sau: S=tong cac so tu nhien khong lon hon n,

S1=tong cac so tu nhien le khong lon hon n, S2=tong cac so tu nhien chan khong lon hon n.

\*/

#include <stdio.h>

main()

{

int n,i,s,s1,s2;

printf("Nhap so n= "); scanf("%d",&n);

s=0; s1=0; s2=0;

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

{

s=s+i;

if(i%2==1) s1=s1+i; // tong so le if(i%2==0) s2=s2+i;

}

// for(i=1;i<=n;i=i+2) s1=s1+i; // tong so le

// for(i=0;i<=n;i=i+2) s2=s2+i; // tong so chan

printf("\nTong cac day so la: s= %d; s1=%d; s2=%d",s,s1,s2);

}

========================================================

C08. Nhập một số c>0 (ví dụ c = 0.0001) và một số thực x rồi tính

## cos x = 1 -

*x*2

2 *!* +

*x*4

## 4 *!* -... +(-1)n

*x*2*n*

(2 *n*)*!*

*x*2*n*

tổng được tính với n đủ lớn sao cho bất đẳng thức |

(2 *n*)*!* |  c thỏa mãn.

So sánh kết quả trên đây với giá trị hàm chuẩn cos(x) có sẵn trong C.

// cos\_x = 1 - x^2/2! + x^4/4!- ...+ (-1)^n x^2n/(2n)! temp = x^2i / (2i)! < c =0.0001

#include<stdio.h> #include<math.h>

main()

{

int i;

float c,x,temp,s;

printf("Nhap x = "); scanf("%f",&x);

printf("Nhap c = "); scanf("%f",&c);

s=1;

temp=1; i=2;

while(temp>=c)

{

temp=x\*x\*temp/(i\*(i-1)); if(i%4!=0) s=s-temp;

else s=s+temp;

i=i+2;

}

printf("\ncos\_x = %f ",s);

printf("\n(Ham chuan) cos\_x = %f ",cos(x));

}

========================================================

Tính sin(x) – hàm sin

C07. Nhập một số c>0 (ví dụ c = 0.0001) và một số thực x rồi tính

## sin x =

*x*

1*!* -

*x*3

3 *!* +

*x*5

## 5 *!* -... +(-1)n

*x*( 2*n*+1)

(2 *n*+1)*!*

*x*( 2*n*+1)

tổng được tính với n đủ lớn sao cho bất đẳng thức |

(2 *n*+1)*!* |  c thỏa mãn.

So sánh kết quả trên đây với giá trị hàm chuẩn sin(x) có sẵn trong C. (x tính theo radian)

// Exercise C07b.

// Tinh sin (x)=x/1!-x^3/3!+x^5/5!+... #include<stdio.h>

#include<math.h> main()

{

int i;

float temp,s,x,c;

printf("Nhap c = "); scanf("%f",&c);

printf("Nhap x = "); scanf("%f",&x); s=x/1; temp=x/1;

i=3;

while(fabs(temp)>=c)

{

temp=-temp\*x\*x/(i\*(i-1)); s=s+temp;

i=i+2;

}

printf("sin(%f) = %f ",x,s);

printf("\n(Ham chuan) sin(x) = %f ",sin(x));

}

========================================================

// Exercise C07b.

// Tinh sin (x)=x/1!-x^3/3!+x^5/5!+... #include<stdio.h>

#include<math.h>

main()

{

int n,i;

float temp,s,x;

printf("Nhap n = "); scanf("%d",&n);

printf("Nhap x = "); scanf("%f",&x); s=x/1; temp=x/1; for(i=3;i<=2\*n+1;i=i+2)

{

temp=-temp\*x\*x/(i\*(i-1)); s=s+temp;

}

printf("sin(%f) = %f ",x,s);

printf("\n(Ham chuan) sin(x) = %f ",sin(x));

}

========================================================

D01. Viết hàm **double emu(float x, float c)** trả về giá trị ex được tính bởi công thức:

## ex = 1+

*x*

1*!* +

*x*2 *xn*

2 *!* + ... + *n!*

*xn*

tổng được tính với n đủ lớn sao cho bất đẳng thức |

*n!* |  c thỏa mãn.

Nhập một số thực a rồi sử dụng hàm trên để tính ax theo công thức ax = exlna (bài này yêu cầu viết hàm ngoài hàm main())

// e^x = 1 + x/1! + x^2/2!+ ...+ x^n/n! temp < c =0.0001

#include<stdio.h> main()

{

int i;

float c,x,temp,s;

printf("Nhap x = "); scanf("%f",&x);

printf("Nhap c = "); scanf("%f",&c);

s=1;

temp=1; i=1;

while(temp>=c)

{

temp=x\*temp/i; s=s+temp;

i++;

}

printf("e^x = %f ",s);

}

======================================================== Hàm e mũ x (CHƯƠNG TRÌNH CON)

// e^x = 1 + x/1! + x^2/2!+ ...+ x^n/n! temp < c =0.0001

#include<stdio.h>

double e\_mu(float x, float c)

{

double s=1, temp=1; int i=1;

while(temp>=c)

{

temp=x\*temp/i; s=s+temp;

i++;

}

return s;

}

main()

{

int i; float c,x; double s;

printf("Nhap x = "); scanf("%f",&x);

printf("Nhap c = "); scanf("%f",&c);

s=e\_mu(x,c);

printf("e^x = %lf ",s);

}

========================================================

// S=1+2+3+…+n

#include<stdio.h> main()

{

int n,i,s=0;

printf("Nhap n= "); scanf("%d",&n); for(i=1;i<=n;i++) s=s+i;

printf("Tong s= %d ",s);

}

========================================================

// S = 1/1 + 1/2 + 1/3 +1/4 + … +1/n

#include<stdio.h> main()

{

int n,i; float s=0;

printf("Nhap n= "); scanf("%d",&n); for(i=1;i<=n;i++) s=s+(float)1/i; printf("Tong s= %f ",s);

}

========================================================

// S = 1/2 + 1/4 + 1/6 +1/8 + … 1/2n (n>=1)

#include<stdio.h> main()

{

int n,i; float s=0;

printf("Nhap n= "); scanf("%d",&n);

// for(i=1;i<=n;i++) s=s+(float)1/(2\*i); for(i=2;i<=2\*n;i=i+2) s=s+(float)1/(i);

printf("Tong s= %f ",s);

}

========================================================

// S = 1/1 + 1/3 + 1/5 +1/7 + …+1/(2n+1) Note: n>=0

#include<stdio.h>

main()

{

int n,i; float s=0;

printf("Nhap n= "); scanf("%d",&n);

for(i=0;i<=n;i++) s=s+(float)1/(2\*i+1);

printf("Tong s= %f ",s);

}

========================================================

// s = 1/1 - 1/3 + 1/5 -1/7 + … + (-1)^n [1/(2n+1)] Note: n>=0

#include<stdio.h> main()

{

int n,i,sign=1; float s=0;

printf("Nhap n= "); scanf("%d",&n);

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

{

// s=s+sign\*(float)1/(2\*i+1);

// sign=-sign;

if(i%2==0) s=s+(float)1/(2\*i+1); else s=s-(float)1/(2\*i+1);

}

printf("Tong s= %f ",s);

}

========================================================

Dãy số giai thừa

// Exercise 7.

// s = 1/1! + 1/2! + … + 1/n! Note: n>=1

#include<stdio.h> main()

{

int n,i;

float temp, s;

printf("Nhap n= "); scanf("%d",&n);

s=1;

temp=1; for(i=2;i<=n;i++)

{

temp=temp/i; s=s+temp;

}

printf("Tong s= %f ",s);

}

========================================================

// Exercise 8

// s = 1/2! + 1/4! + … + 1/2n! Note: n>=1

#include<stdio.h> main()

{

int n,i;

float temp,s=0;

printf("Nhap n= "); scanf("%d",&n); temp=1; s=0;

for(i=2;i<=2\*n;i=i+2)

{

temp=temp/(i\*(i-1)); s=s+temp;

}

printf("Tong s= %f ",s);

}

========================================================

// Exercise 8

// Exercise 9.

// s = 1/1! + 1/3! + 1/5! + … + 1/2n+1! Note: n>=0

#include<stdio.h> main()

{

int n,i;

float temp,s=0;

printf("Nhap n= "); scanf("%d",&n); temp=1; s=1; for(i=3;i<=2\*n+1;i=i+2)

{

temp=temp/(i\*(i-1)); s=s+temp;

}

printf("Tong s= %f ",s);

}

========================================================

// Exercise 10.

// s = 1/1! - 1/2! + 1/3! - 1/4! + … (-1)^(n+1) \* 1/n! Note: n>=1

#include<stdio.h> main()

{

int n,i;

float temp,s=0;

printf("Nhap n= "); scanf("%d",&n); temp=1; s=1;

for(i=2;i<=n;i++)

{

temp=-temp/i; s=s+temp;

}

printf("Tong s= %f ",s);

}

========================================================

// Exercise 11.

// s = 1 - 1/3! + 1/5! + … (-1)^n \* 1/2n+1! Note: n>=0

#include<stdio.h> main()

{

int n,i;

float temp=1,s=1;

printf("Nhap n= "); scanf("%d",&n);

for(i=3;i<=2\*n+1;i=i+2)

{

temp=-temp/(i\*(i-1)); s=s+temp;

}

printf("Tong s= %f ",s);

}

========================================================

========================================================

========================================================

========================================================

========================================================

========================================================

========================================================

========================================================

# MẢNG - ARRAY

========================================================

// dao nguoc lai cac phan tu mang

#include <stdio.h> main()

{

int max,n,i,t,a[100];

// INPUT

printf("Nhap so phan tu mang: n = "); scanf("%d",&n); printf("Nhap du lieu cho %d phan tu mang\n",n); for(i=0;i<=n-1;i++)

{

printf("Nhap a[%d]=",i);

scanf("%d",&a[i]);

}

// OUTPUT

printf("Mang vua duoc nhap la:\n"); for(i=0;i<=n-1;i++)

{

printf("%d ",a[i]);

}

// Dao vi tri cac phan tu mang for(i=0;i<=n/2-1;i++)

{ t=a[i]; a[i]=a[n-1-i]; a[n-1-i]=t;}

// Ket qua (OUTPUT)

printf("\nMang sau khi duoc dao:\n"); for(i=0;i<=n-1;i++)

{

printf("%d ",a[i]);

}

// Tinh max

max=a[0];

for(i=1;i<=n-1;i++) if(max<a[i]) max=a[i];

printf("\nGia tri max = %d",max);

// Tinh min

int min=a[0];

for(i=1;i<=n-1;i++) if(a[i]<min) min=a[i];

printf("\nGia tri min = %d",min);

// Tinh tong cac so le

int s=0;

for(i=0;i<=n-1;i++) if(a[i]%2==1) s=s+a[i];

printf("\nTong cac so le = %d",s);

// Tinh tong cac so co chi so le int s1=0;

for(i=1;i<=n-1;i=i+2) s1=s1+a[i];

printf("\nTong cac so co chi so le = %d",s1);

}

========================================================

#include<stdio.h> int main()

{

int a[100],max,i,n,vt;

printf("Nhap so phan tu mang: n = "); scanf("%d",&n); printf("Nhap du lieu cho %d phan tu mang\n",n); for(i=0;i<=n-1;i++)

{

printf("Nhap a[%d]=",i);

scanf("%d",&a[i]);

}

// VI TRI DAU TIEN CO GIA TRI LON NHAT

max=a[0]; vt=0;

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

if (a[i]>max)

{

vt=i; max=a[i];

}

printf ("\nmax = %d, vi tri dau tien = %d ",max,vt);

// VI TRI CUOI CUNG CO GIA TRI LON NHAT

max=a[n-1]; vt=n-1;

for (i=n-2; i>=0; i--)

if (a[i]>max)

{

vt=i;

max=a[i];

}

printf ("\nmax = %d, vi tri cuoi cung = %d ",max,vt);

}

========================================================

/\* Tim gia tri lon thu 2 trong mang

\*/

#include <stdio.h> main()

{

int max, max2,i,n, a[100];

printf("Nhap so phan tu mang: n = "); scanf("%d",&n); printf("Nhap du lieu cho %d phan tu mang\n",n); for(i=0;i<=n-1;i++)

{

printf("Nhap a[%d]=",i);

scanf("%d",&a[i]);

}

// CODE TIM SO LON THU 2 TRONG MANG

max=a[0]; for(i=1; i<n; i++){

if(a[i]>max) max=a[i];

}

int min=a[0];

for(i=1;i<=n-1;i++) if(a[i]<min) min=a[i];

max2=min; for(i=1; i<n; i++){

if(a[i]>max2 && a[i]<max) max2=a[i];

}

//OUTPUT

printf("Gia tri lon thu 2 trong mang la %d",max2);

}

========================================================

#include <stdio.h> main ()

{

int number[30];

int i, j, a, n, counter, average;

printf("Enter the value of N\n"); scanf("%d", &n);

printf("Enter the numbers \n"); for (i = 0; i < n; ++i)

scanf("%d", &number[i]);

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

{

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

{

if (number[i] < number[j])

{

a = number[i]; number[i] = number[j]; number[j] = a;

}

}

}

printf("The numbers arranged in descending order are given below \n");

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

{

printf("%d\n", number[i]);

}

printf("The 2nd largest number is = %d\n", number[1]); printf("The 2nd smallest number is = %d\n", number[n - 2]);

average = (number[1] + number[n - 2]) / 2; counter = 0;

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

{

if (average == number[i])

{

++counter;

}

}

if (counter == 0 )

printf("The average of %d and %d is = %d is not in the array \n", number[1], number[n - 2], average);

else

printf("The average of %d and %d in array is %d in numbers \n", number[1], number[n - 2], counter);

}

========================================================

// Xoa 1 phan tu mang

#include <stdio.h>

void input(int n, int a[])

{

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

{

printf("a[%d]=",i); scanf("%d",&a[i]);

}

}

void display(int n, int a[])

{

for(int i=0; i<=n-1; i++) printf("%d ",a[i]);

}

//

main()

{

int n,m,i,a[100];

printf("Nhap so phan tu mang: n="); scanf("%d",&n);

printf("NHAP DU LIEU:\n");

input(n,a);

printf("Mang vua nhap la: "); display(n,a);

// CODE XOA 1 PHAN TU MANG

printf("\nNhap phan tu can xoa: m = "); scanf("%d",&m); for(i=m;i<=n-2;i++) a[i]=a[i+1];

n=n-1;

// OUTPUT

printf("\nMang sau khi xoa mot phan tu la: "); display(n,a);

}

========================================================

========================================================

========================================================

========================================================

# CHUỖI - STRING

========================================================

========================================================

========================================================

// Xoa 1 phan tu mang

#include <stdio.h>

void input(int n, int a[])

{

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

{

printf("a[%d]=",i); scanf("%d",&a[i]);

}

}

void display(int n, int a[])

{

for(int i=0; i<=n-1; i++) printf("%d ",a[i]);

}

//

main()

{

int n,m,i,a[100];

printf("Nhap so phan tu mang: n="); scanf("%d",&n);

printf("NHAP DU LIEU:\n"); input(n,a);

printf("Mang vua nhap la: "); display(n,a);

// CODE XOA 1 PHAN TU MANG

printf("\nNhap phan tu can xoa: m = "); scanf("%d",&m); for(i=m;i<=n-2;i++) a[i]=a[i+1];

n=n-1;

// OUTPUT

printf("\nMang sau khi xoa mot phan tu la: "); display(n,a);

}

========================================================

// Dem so chu trong 1 string

#include<stdio.h> #include<stdlib.h> #include<string.h> #include<ctype.h> main()

{

int i,n,counter=0; char s[100];

printf("Nhap chuoi ky tu: "); gets(s);

n=strlen(s);

// CODE dem so tu trong string s for(i=0;i<=n-2;i++)

{

if(' '==s[i]&&s[i+1]!=' ') counter++;

}

if(s[0]!=' ') counter=counter+1;

// OUTPUT

printf("So word trong string s la: %d", counter);

}

========================================================

#include<stdio.h> #include<stdlib.h> #include<string.h> #include<ctype.h> main()

{

int i,n,ca=0,cb=0,cc=0; char s[100];

printf("Nhap chuoi ky tu: "); gets(s);

n=strlen(s);

// CODE dem so ky tu xuat hien trong string s

// Khong phan biet chu Hoa chu Thuong for(i=0;i<=n-1;i++)

{

if(s[i]=='A'||s[i]=='a') ca++;

if(s[i]=='B'||s[i]=='b') cb++;

if(s[i]=='C'||s[i]=='c') cc++;

}

// OUTPUT

printf("So ky tu 'A'+'a', 'B'+'b', 'C'+'c' tuong ung la: %d, %d, %d",ca,cb,cc);

}

========================================================

/\*

D04. Cho mot chuoi gom nhieu tu. Hay nhap mot tu sau do thuc hien tim tu do trong chuoi va xoa tu nay neu tim thay.

\*/

#include<stdio.h> #include<string.h>

/\* Chuong tirnh con tao mang 2 chieu a[100][30] chua cac word cua mot string s.

+ s la string truyen vao

+ a la mang 2 chieu duoc tao ra

+ n la so tu trong chuoi s = so phan tu trong mang a

\*/

void split(char s[], char a[][30], int &n)

{

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

while(s[i]!='\0')

{

k=0;

while(s[i]!=' '&&s[i]!='\0')

{

a[j][k]=s[i]; i++; k++;

}

if(s[i]!='\0') i++;

a[j][k]='\0'; j++;

}

n=j;

}

// Doan code tim xem co tu nao trung voi tu can nhap de xoa void tim\_xoa(char a[][30], int n, char x[],char s[])

{

int i;

strcpy(s,""); // Xoa string s for(i=0; i<=n-1;i++)

{

if(strcmp(a[i],x)!=0) // Neu khong giong x thi chen vao s

{

strcat(s," "); // s=s+' ';

strcat(s,a[i]); // s=s+a[i];

}

}

for(i=0;s[i]!='\0';i++) s[i]=s[i+1]; // Xoa dau cach dau tien

}

//

main()

{

int i,j,k,n; char s[100];

char a[100][30]; // Mang a gom toi da 100 chu, moi chu toi da 30 ky tu. char x[30]; // Chua tu can tim va xoa

printf("Nhap string s: "); // Gia thiet nhap vao chuan khong thua dau cach gets(s);

split(s,a,n);

printf("Nhap tu can xoa: x = ");

gets(x);

tim\_xoa(a,n,x,s);

// OUTPUT

printf("\n%s",s);

}

========================================================

### (2 marks, file to be edited: Q3.cpp)

Complete the function **fun(int tc, char s[])**. The **task of** the function **fun**:

**if tc = 1** then

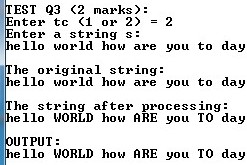
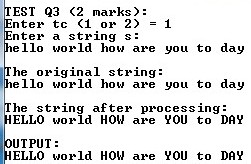
**convert all words** at even positions to uppercase.

### otherwise

**convert all words** at odd positions to uppercase.

**Notes**: (1) word is a string without space(s) (2) You *can create new function(s)* if you see it is necessary. (3) Do *not edit* the **main** function.

### Sample input and output:



#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h>

//remove redundant spaces in a string s void removeRedSpaces(char s[])

{int n,low, up, i, j; char x[100]; n = strlen(s);

i=0; j=n-1;

while(i<n && s[i]==' ') i++; low = i;

while(j>0 && s[j]==' ') j--; up = j;

if(low>up) {strcpy(s,""); return;} strcpy(x,"");

i = low; j=0; while(i<=up)

{while(i<up && s[i]==' ') i++; while(i<=up && s[i]!=' ') x[j++] = s[i++]; if(i<=up) x[j++] = ' ';

}

x[j] = '\0';

strcpy(s,x);

}

//Enter data for a string s void input(char s[])

{printf("Enter a string s:\n"); fflush(stdin);

gets(s); removeRedSpaces(s);

}

//Display a string s void display(char s[])

{printf("%s\n",s);

}

//

void split(char s[], char a[][30], int &n)

// Tao mang 2 chieu a[100][30] chua cac word cua mot string s.

{

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

while(s[i]!='\0')

{

k=0;

while(s[i]!=' '&&s[i]!='\0')

{

a[j][k]=s[i]; i++; k++;

}

if(s[i]!='\0') i++;

a[j][k]='\0'; j++;

}

n=j;

}

//

void even\_position\_uppercase(char a[][30],int n,char s[])

{

char x[30]; int i,j,k;

for(i=0;i<=n-1;i=i+2)

{

k=strlen(a[i]); for(j=0;j<=k-1;j++)

{

if((a[i][j]>='a')&&(a[i][j]<='z')) a[i][j]=a[i][j]-32;

}

}

// copy tro lai string s strcpy(s,a[0]); for(i=1; i<=n-1;i++)

{

strcat(s," "); // s=s+' ';

strcat(s,a[i]); // s=s+a[i];

}

}

//

void odd\_position\_uppercase(char a[][30],int n,char s[])

{

char x[30]; int i,j,k;

for(i=1;i<=n-1;i=i+2)

{

k=strlen(a[i]); for(j=0;j<=k-1;j++)

{

if((a[i][j]>='a')&&(a[i][j]<='z')) a[i][j]=a[i][j]-32;

}

}

// copy tro lai string s strcpy(s,a[0]); for(i=1; i<=n-1;i++)

{

strcat(s," "); // s=s+' ';

strcat(s,a[i]); // s=s+a[i];

}

}

//

void fun(int tc, char s[]) // Complete this function

{// Write your statements here

// Tao mang 2 chieu a chua cac n word cua s char a[100][30];

int n; split(s,a,n);

if(1==tc) // if tc = 1 then convert all words at even positions to uppercase.

{

even\_position\_uppercase(a,n,s);

}

else // otherwise convert all words at odd positions to uppercase.

{

odd\_position\_uppercase(a,n,s);

}

}

//================================

int main() { // Do not edit this function

// system("cls");

printf("\nTEST Q3 (2 marks):\n"); int tc;

char s[100];

printf("Enter tc (1 or 2) = ");

scanf("%d",&tc); input(s);

printf("\nThe original string:\n"); display(s);

printf("\nThe string after processing:\n"); fun(tc,s);

display(s);

//OUTPUT for marking: printf("\nOUTPUT:\n"); display(s);

printf("\n");

system ("pause"); return(0);

}

========================================================

### (4 marks, file to be edited: Q1.cpp)

**Notes**: (1) You can create new function(s) if you see it is necessary. (2) In the main function: (a) **Do not edit given statements**. (b) **Write statements in the indicated area** only. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1 (1 mark):

Enter data for 3 given variables a, b, c. Suppose a contains the number of minutes. Calculate b and c so that b is the number of hours and c is the number of minutes calculated from a. E.g. if a = 150 then b = 2 and c = 30.

### Sample output:

**TC2 (3 marks):**

Enter data for 2 given integer variables m and n. Calculate the sum s as below:

if n < m then s = 1+

1 1

2 + 3 +...+

1

*n* , . E.g. if m = 20 and n = 5 then s = 1+

1 1

## 2 + 3 +

1 1

4 + 5 = 2.833

otherwise (i.e. n ≥ m)

s = the least common multiple of m and n. E.g. if m = 12, n = 18 then s = 36.

### Sample output:

#include <stdio.h> #include <stdlib.h> #include <string.h> #include <math.h>

int main() { system("cls");

printf("\nTEST Q1 (4 marks):\n"); printf("1. Run TC 1\n");

printf("2. Run TC 2\n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1

int a, b, c;

printf("Enter a = "); scanf("%d",&a);

//==FOR TC 1, WRITE YOUR STATEMENTS FROM HERE=========

b=a/60; c=a%60;

//=========TO HERE============

printf("a = %d, b = %d, c = %d\n",a,b,c);

// OUTPUT for marking:

printf("\nOUTPUT:\n"); printf("%d %d %d\n",a,b,c);

}; break; // The end of TC1

case 2: { // Start of TC 2

int m, n; double s;

printf("Enter m = "); scanf("%d",&m);

printf("Enter n = "); scanf("%d",&n);

//== TC 2, WRITE YOUR STATEMENTS FROM HERE =========

if(n<m) // s=1+1/2+...+1/n

{

s=0;

for(int i=1;i<=n;i++) s=s+(double)1/i;

}

else // otherwise (i.e. n >= m)

// s = the least common multiple of m and n.

// E.g. if m = 12, n = 18 then s = 36.

{

int i=n; while((i%m!=0)||(i%n!=0)) i++; s=i;

}

//=========TO HERE============

//

if(n<m)

printf("s = %.4f\n",s); else

printf("s = %.0f\n",s);

// OUTPUT for marking: printf("\nOUTPUT:\n"); if(n<m) printf("%.4f\n",s);

else printf("%.0f\n",s);

}; break; // The end of TC2

}

printf("\n");

system ("pause"); return(0);

}

========================================================

### (4 marks, file to be edited: Q2.cpp)

**Notes**: (1) Your task is to complete 2 functions: fen() and fun(). (2) You can create other function(s), if you see it is necessary. (3) Do *not edit* the **main** function. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1:

Complete the given **fen(double x, double y, int n)** function, which calculates and returns the value fen(x,y,n) using the formula below:

fen(x,y,n) = 1-

*xy2*

3∗3 *!* +

*x*2 *y*3

5∗5 *!* -

*x*3 *y* 4

7∗7 *!* +...+(-1)n

*xn yn*+1

(2 *n*+1)(2 *n*+1)*!*

### TC2:

Complete the function **fun(int a[], int &n)**. The **task of** the function **fun**:

Check if **n is odd** (e.g. n = 7) then sort elements with odd index ascendingly (i.e. a[1], a[3],...will be sorted ascendingly).

**otherwise** (i.e. n is even) sort elements with even index descendingly (i.e. a[0], a[2],...will be sorted ascendingly)..

### Sample input and output:

|  |  |  |
| --- | --- | --- |
|  |  |  |

========================================================

#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h> #include <math.h>

//note: int &n means that the variable n is passed to the function, not it's copy. void input(int a[], int &n) {

printf("Enter number of elements n = "); scanf("%d",&n);

printf("Enter %d elements:\n",n);

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

{printf("a[%d] = ",i);

scanf("%d",&a[i]);

}

}

void display(int a[], int n) {

for(int i=0;i<n;i++) printf("%d ",a[i]); printf("\n");

}

//

double fen(double x,double y, int n) { // You should complete this function

// Write your statements here double s,t;

t=-x\*y\*y/6; s=1+t/3;

for(int i=2;i<=n;i++)

{

t=-t\*x\*y/(2\*i\*(2\*i+1)); s=s+t/(2\*i+1);

}

return s; //This statement must be changed

}

void fun(int a[], int &n) { // You should complete this function

// Write your statements here int i,j,k,t;

if(1==n%2) // Check if n is odd (e.g. n = 7) then sort elements with

// odd index ascendingly (i.e. a[1], a[3],...will be sorted ascendingly).

{

for(i=1;i<=n-3;i=i+2)

for(j=i+2;j<=n-1;j=j+2)

{

if(a[i]>a[j]) { t=a[i]; a[i]=a[j]; a[j]=t; }

}

}

else // otherwise (i.e. n is even) sort elements with

//even index descendingly (i.e. a[0], a[2],...

// will be sorted ascendingly)..

{

for(i=0;i<=n-3;i=i+2)

for(j=i+2;j<=n-1;j=j+2)

{

if(a[i]<a[j]) { t=a[i]; a[i]=a[j]; a[j]=t; }

}

}

}

int main() { // Do not edit this function system("cls");

printf("\nTEST Q2 (4 marks):\n"); printf("1. Run TC 1 (fen) \n");

printf("2. Run TC 2 (fun) \n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1 double x,y, s; int n;

printf("Enter x = "); scanf("%lf",&x);

printf("Enter y = "); scanf("%lf",&y);

printf("Enter n = "); scanf("%d",&n); s = fen(x,y,n);

printf("fen(%.1f,%.1f,%d) = %.4f\n",x,y,n,s); printf("\nOUTPUT:\n");

printf("%.4f\n",s);

} break; // end of TC 1

case 2: { // Start of TC 2

int a[100]; int n; input(a,n);

printf("\nThe original array:\n"); display(a,n);

fun(a,n);

printf("\nThe array after processing:\n"); display(a,n);

// OUTPUT for marking: printf("\nOUTPUT:\n"); display(a,n);

printf("\n");

}; break; // The end of TC2

}

printf("\n\n");

system ("pause"); return(0);

}

========================================================

### (4 marks, file to be edited: Q1.cpp)

**Notes**: (1) You can create new function(s) if you see it is necessary. (2) In the main function: (a) **Do not edit given statements**. (b) **Write statements in the indicated area** only. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1 (1 mark):

Enter data for 3 given variables a, b and c, then sort them in ascending order (see sample output).

### Sample output:

**TC2 (3 marks):**

Enter data for 2 given integer variables m and n. Calculate the sum s as below: if n < m then s = 1+2+…+n. E.g. if m = 20 and n = 5 then s = 1+2+3+4+5 = 15 otherwise (i.e. n ≥ m)

s = sum of all prime digits of n. E.g. if m = 100 and n = 12435 then s = 2 + 3 + 5 = 10.

### Sample output:

#include <stdio.h> #include <stdlib.h>

#include <string.h> #include <math.h>

int isPrime(int m) { if(m==1) return(0); if(m==2) return(1); for(int i=2;i<=sqrt(m);i++) if(m%i==0) return(0); return(1);

}

int main() { system("cls");

printf("\nTEST Q1 (4 marks):\n"); printf("1. Run TC 1\n");

printf("2. Run TC 2\n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1

double a, b, c;

printf("Enter a = "); scanf("%lf",&a);

printf("Enter b = "); scanf("%lf",&b);

printf("Enter c = "); scanf("%lf",&c);

//==FOR TC 1, WRITE YOUR STATEMENTS FROM HERE=========

double x;

if(b<a) {x=a;a=b;b=x;}

if(c<a) {x=a;a=c;c=x;}

if(c<b) {x=b;b=c;c=x;}

//=========TO HERE============

printf("a = %.0f, b = %.0f, c = %.0f\n",a,b,c);

// OUTPUT for marking: printf("\nOUTPUT:\n"); printf("%.0f %.0f %.0f\n",a,b,c);

}; break; // The end of TC1

case 2: { // Start of TC 2

int m, n, s;

printf("Enter m = "); scanf("%d",&m);

printf("Enter n = "); scanf("%d",&n);

//== TC 2, WRITE YOUR STATEMENTS FROM HERE =========

int i,k; if(n<m) { s = 0;

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

}

else { s = 0;

while(n>0) { i = n%10;

if(isPrime(i)) s += i;

n = n/10;

}

}

//=========TO HERE============

//

printf("s = %d\n",s);

// OUTPUT for marking: printf("\nOUTPUT:\n"); printf("%d\n",s);

}; break; // The end of TC2

}

printf("\n");

system ("pause"); return(0);

}

========================================================

### (4 marks, file to be edited: Q2.cpp)

**Notes**: (1) Your task is to complete 2 functions: fen() and fun(). (2) You can create other function(s), if you see it is necessary. (3) Do *not edit* the **main** function. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1:

Complete the given **fen(double x, double y, int n)** function, which calculates and returns the value fen(x,y,n) using the formula below:

## fen(x,y,n) = (1+

*x*

1*!* +

*x*2

## 2 *!* + ... +

*xn*

*n!* ) + (

*y*

1*!* -

*y*3

3*!* +

*y*5

## 5*!* -... +(-1)n

*y*(2 *n*+1)

(2 *n*+1)*!* )

### TC2:

Complete the function **fun(int a[], int &n)**. The **task of** the function **fun**: Check if **n is odd** (e.g. n = 7) then sort the array ascendingly.

**otherwise** (i.e. n is even) delete the first maximum value in the array.

### Sample input and output:

|  |  |  |
| --- | --- | --- |
|  |  |  |

#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h> #include <math.h>

//note: int &n means that the variable n is passed to the function, not it's copy. void input(int a[], int &n) {

printf("Enter number of elements n = "); scanf("%d",&n);

printf("Enter %d elements:\n",n); for(int i=0;i<n;i++)

{printf("a[%d] = ",i);

scanf("%d",&a[i]);

}

}

void display(int a[], int n) {

for(int i=0;i<n;i++) printf("%d ",a[i]); printf("\n");

}

//

double fen(double x,double y, int n) { // You should complete this function

// Write your statements here double t, s1, s2, d; int i,k;

// calculate s1 t=1; s1 = t; for(i=1;i<=n;i++) {

t \*= x/i; s1 += t;

}

t = y/1;

s2 = t; d = 1; for(i=1;i<=n;i++) {

k = 2\*i+1;

t \*= y\*y/(k\*(k-1)); d = -d;

s2 += d\*t;

}

return(s1+s2); //This statement must be changed

}

void sort(int a[], int n) { int i,j; int x; for(i=0;i<n-1;i++) for(j=i+1;j<n;j++)

if(a[j]<a[i]) {

x = a[i]; a[i] = a[j]; a[j] = x;

}

}

int max(int a[], int n) {

int tmax = a[0]; int k = 0; for(int i=1;i<n;i++)

if(a[i] > tmax) { k = i;

tmax = a[i];

}

return(k);

}

void delePos(int a[], int &n, int i) { if(i<0 || i>n-1) return;

for(int j=i;j<n-1;j++) a[j] = a[j+1]; n--;

}

void fun(int a[], int &n) { // You should complete this function

// Write your statements here if(n%2==1)

sort(a,n); else {

int k = max(a,n);

delePos(a,n,k);

}

}

int main() { // Do not edit this function system("cls");

printf("\nTEST Q2 (4 marks):\n"); printf("1. Run TC 1 (fen) \n");

printf("2. Run TC 2 (fun) \n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1 double x,y, s; int n;

printf("Enter x = "); scanf("%lf",&x);

printf("Enter y = "); scanf("%lf",&y);

printf("Enter n = "); scanf("%d",&n); s = fen(x,y,n);

printf("fen(%.1f,%.1f,%d) = %.4f\n",x,y,n,s); printf("\nOUTPUT:\n");

printf("%.4f\n",s);

} break; // end of TC 1

case 2: { // Start of TC 2

int a[100]; int n; input(a,n);

int n1 = n; // TO BE DELETED printf("\nThe original array:\n"); display(a,n);

fun(a,n);

printf("\nThe array after processing:\n"); display(a,n);

// OUTPUT for marking: printf("\nOUTPUT:\n"); display(a,n);

printf("\n");

}; break; // The end of TC2

}

printf("\n\n");

system ("pause"); return(0);

}

========================================================

### (2 marks, file to be edited: Q3.cpp)

Complete the function **fun(int tc, char s[])**. The **task of** the function **fun**:

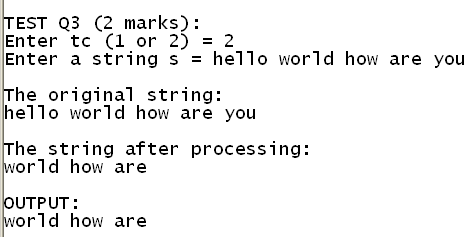
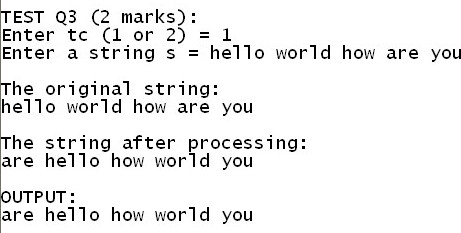
**if tc = 1** then

**sort all words** in the string s **ascendingly**. **otherwise**

**delete the first and the last word** of the string s.

**Notes**: (1) word is a string without space(s) (2) You *can create new function(s)* if you see it is necessary. (3) Do *not edit* the **main** function.

### Sample input and output:



#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h>

//remove redundant spaces in a string s void removeRedSpaces(char s[])

{int n,low, up, i, j; char x[100]; n = strlen(s);

i=0; j=n-1;

while(i<n && s[i]==' ') i++; low = i;

while(j>0 && s[j]==' ') j--; up = j;

if(low>up) {strcpy(s,""); return;} strcpy(x,"");

i = low; j=0; while(i<=up)

{while(i<up && s[i]==' ') i++; while(i<=up && s[i]!=' ') x[j++] = s[i++]; if(i<=up) x[j++] = ' ';

}

x[j] = '\0';

strcpy(s,x);

}

//Enter data for a string s void input(char s[])

{printf("Enter a string s:\n"); fflush(stdin);

gets(s); removeRedSpaces(s);

}

//Display a string s void display(char s[])

{printf("%s\n",s);

}

//

void split(char u[], char a[][30], int &m) { int n,i,j,k; char x[30];

n = strlen(u); i = 0; k = 0;

while(i<n) {

while(i<n && u[i]==' ') i++; if(i>n-1) break;

j = 0;

while(i<n && u[i] != ' ') x[j++] = u[i++]; x[j] = '\0';

strcpy(a[k],x); k++;

}

m = k;

}

void sort(char a[][30], int m) { int i,j; char x[30]; for(i=0;i<m-1;i++) for(j=i+1;j<m;j++)

if(strcmp(a[j],a[i])<0) {

strcpy(x,a[i]); strcpy(a[i],a[j]); strcpy(a[j],x);

}

}

void arrayToString(char a[][30], int m, char s[]) { strcpy(s,a[0]);

for(int i=1;i<m;i++) { strcat(s," ");

strcat(s,a[i]);

}

}

void fun(int tc, char s[]) { // Complete this function

// Write your statements here char a[100][30]; int m; split(s,a,m);

if(tc==1) { sort(a,m);

arrayToString(a,m,s);

}

else { strcpy(s,a[1]);

for(int i=2;i<m-1;i++) {

strcat(s," ");

strcat(s,a[i]);

}

}

}

int main() { // Do not edit this function

// system("cls");

printf("\nTEST Q3 (2 marks):\n"); int tc;

char s[100];

printf("Enter tc (1 or 2) = "); scanf("%d",&tc);

input(s);

printf("\nThe original string:\n"); display(s);

printf("\nThe string after processing:\n"); fun(tc,s);

display(s);

//OUTPUT for marking: printf("\nOUTPUT:\n"); display(s);

printf("\n");

system ("pause"); return(0);

}

========================================================

# (4 marks, file to be edited: Q1.cpp)

**Notes**: (1) You can create new function(s) if you see it is necessary. (2) In the main function: (a) **Do not edit given statements**. (b) **Write statements in the indicated area** only. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1 (1 mark):

Nhập ba double a, b và c. Kiểm tra xem 3 biến có là ba cạnh của 1 tam giác hay không. (see sample output).

### Sample output:

**TC2 (3 marks):**

Nhập một số n, nếu n <10 là thì tính s = n!

Ngược lại (n>=10) thì tính s = tổng các chữ số của n là chẵn. Ví dụ: n = 215633 thì s = 2+6 = 8.

### Sample output:

#include <stdio.h> #include <stdlib.h>

#include <string.h> #include <math.h>

int ktsonguyento(int n)

{

int check=1; // check=0 - ko la so nguyen to va nguoc lai if(1==n||0==n) check=0;

for(int i=2;i<=n-1;i++) if(n%i==0) check=0; return check;

}

int main() { system("cls");

printf("\nTEST Q1 (4 marks):\n"); printf("1. Run TC 1\n");

printf("2. Run TC 2\n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1

double a, b, c, check\_tam\_giac; printf("Enter a = "); scanf("%lf",&a);

printf("Enter b = "); scanf("%lf",&b);

printf("Enter c = "); scanf("%lf",&c);

//==FOR TC 1, WRITE YOUR STATEMENTS FROM HERE=========

// Kiem tra xem ba bien co phai la 3 canh cua 1 tam gia khong. check\_tam\_giac=0;

if(a<b+c&&b<=a+c&&c<=a+b) check\_tam\_giac=1;

//=========TO HERE============

if(1==check\_tam\_giac) printf("%.0f, %.0f, %.0f CO la ba canh cua 1 tam giac\n",a,b,c); else printf("%.0f, %.0f, %.0f KHONG la ba canh cua 1 tam giac\n",a,b,c);

// OUTPUT for marking:

printf("OUTPUT:\n");

if(1==check\_tam\_giac) printf("%.0f, %.0f, %.0f CO la ba canh cua 1 tam giac\n",a,b,c); else printf("%.0f, %.0f, %.0f KHONG la ba canh cua 1 tam giac\n",a,b,c);

}; break; // The end of TC1

case 2: { // Start of TC 2

int n, s;

printf("Enter n = "); scanf("%d",&n);

//== TC 2, WRITE YOUR STATEMENTS FROM HERE ========= s=1;

if(n<10) for(int i=1;i<=n; i++) s=s\*i; else

{

s=0;

while(n)

{

if((n%10)%2==0) s=s+n%10;

n=n/10;

}

}

//=========TO HERE============

//

printf("s = %d\n",s);

// OUTPUT for marking: printf("\nOUTPUT:\n"); printf("%d\n",s);

}; break; // The end of TC2

}

printf("\n");

system ("pause"); return(0);

}

========================================================

# (4 marks, file to be edited: Q2.cpp)

**Notes**: (1) Your task is to complete 2 functions: fen() and fun(). (2) You can create other function(s), if you see it is necessary. (3) Do *not edit* the **main** function. (3) Suppose that **a user enter data correctly**, thus you do not need to write code to check input.

### TC1:

Complete the given **fen(double x, double y, int n)** function, which calculates and returns the value fen(x,y,n) using the formula below:

fen(x,y,n) = (1+

*x*

1*!* +

*x*2

## 2 *!* + ... +

*xn* 1 1

## *n!* ) - 4\* (1- 3 + 5 -

1

## 7 +...+(-1)n

1

2 *n*+1 )

### TC2:

Complete the function **fun(int a[], int &n)**. The **task of** the function **fun**: Nếu n lẻ (ví dụ n=7) thì thay (các) giá trị lớn nhất của mảng thành số 100. Ngược lại (nếu n chẵn) thì xóa giá trị min cuối cùng của mảng.

### Sample input and output:

|  |  |  |
| --- | --- | --- |
|  |  |  |

#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h> #include <math.h>

//note: int &n means that the variable n is passed to the function, not it's copy. void input(int a[], int &n) {

printf("Enter number of elements n = "); scanf("%d",&n);

printf("Enter %d elements:\n",n); for(int i=0;i<n;i++)

{printf("a[%d] = ",i);

scanf("%d",&a[i]);

}

}

void display(int a[], int n) {

for(int i=0;i<n;i++) printf("%d ",a[i]); printf("\n");

}

//

double fen(double x, int n) { // You should complete this function

// Write your statements here double s1,s2,s,t;

int i; t=x; s1=1+x;

for(i=2;i<=n;i++)

{

t=t\*x/i; s1=s1+t;

}

s2=0;

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

{

if(i%2==1) s2=s2-(double)1/(i\*2+1); else s2=s2+(double)1/(i\*2+1);

}

s=s1-4\*s2;

return s; //This statement must be changed

}

void fun(int a[], int &n) { // You should complete this function

// Write your statements here int i,t;

if(n%2==1) // ) Thay (cac) gia tri max thanh 100.

{

int max=a[0];

for(i=1;i<=n-1;i++) if(max<a[i]) max=a[i]; // Tim gia tri max

for(i=0;i<=n-1;i++) if(max==a[i]) a[i]=100; // Thay cac gia tri max = 100;

}

else // Xoa phan tu min cuoi cung cua mang

{

int vt=0;

int min=a[0];

for(i=n-1;i>=0;i--) if(min>a[i]) {min=a[i]; vt=i;} // Tim min va vi tri cuoi cung tuong ung.

for(i=vt;i<=n-1;i++) a[i]=a[i+1]; // Xoa gia tri min

// a[n-1]='\0'; // Chot chuoi

n=n-1; // Thay doi so phan tu mang

}

}

int main() { // Do not edit this function system("cls");

printf("\nTEST Q2 (4 marks):\n"); printf("1. Run TC 1 (fen) \n");

printf("2. Run TC 2 (fun) \n");

//tc holds the test case number of test int tc;

printf("Enter TC (0 to exit): "); scanf("%d",&tc); if(tc==0) return(0);

//============================================================

switch(tc) {

case 1: { // Start of TC 1 double x,y, s; int n;

printf("Enter x = "); scanf("%lf",&x);

printf("Enter n = "); scanf("%d",&n); s = fen(x,n);

printf("fen(%.1f,%d) = %.4f\n",x,n,s); printf("\nOUTPUT:\n"); printf("%.4f\n",s);

} break; // end of TC 1

case 2: { // Start of TC 2

int a[100]; int n; input(a,n);

int n1 = n; // TO BE DELETED printf("\nThe original array:\n"); display(a,n);

fun(a,n);

printf("\nThe array after processing:\n"); display(a,n);

// OUTPUT for marking: printf("\nOUTPUT:\n"); display(a,n);

printf("\n");

}; break; // The end of TC2

}

printf("\n\n");

system ("pause"); return(0);

}

========================================================

# (2 marks, file to be edited: Q3.cpp)

Complete the function **fun(int tc, char s[])**. The **task of** the function **fun**:

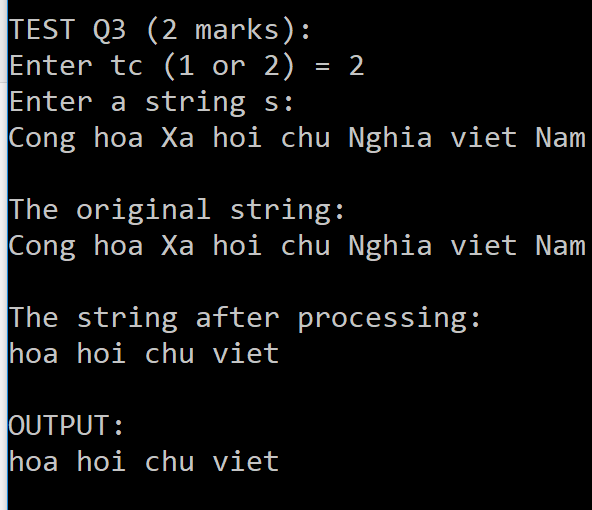
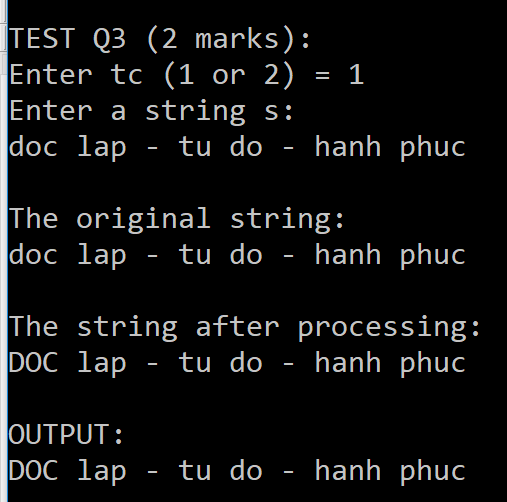
**if tc = 1** thì đổi chữ đầu tiên thành chữ in HOA.

### otherwise

**xóa** các chữ có chữ cái đầu tiên là in HOA.

**Notes**: (1) word is a string without space(s) (2) You *can create new function(s)* if you see it is necessary. (3) Do *not edit* the **main** function.

### Sample input and output:



#include <stdio.h> #include <stdlib.h> #include <string.h> #include <ctype.h>

//remove redundant spaces in a string s void removeRedSpaces(char s[])

{int n,low, up, i, j; char x[100]; n = strlen(s);

i=0; j=n-1;

while(i<n && s[i]==' ') i++; low = i;

while(j>0 && s[j]==' ') j--; up = j;

if(low>up) {strcpy(s,""); return;} strcpy(x,"");

i = low; j=0; while(i<=up)

{while(i<up && s[i]==' ') i++; while(i<=up && s[i]!=' ') x[j++] = s[i++]; if(i<=up) x[j++] = ' ';

}

x[j] = '\0';

strcpy(s,x);

}

//Enter data for a string s void input(char s[])

{printf("Enter a string s:\n"); fflush(stdin);

gets(s); removeRedSpaces(s);

}

//Display a string s void display(char s[])

{printf("%s\n",s);

}

//

void split(char s[], char a[][30], int &n) // Tao mang 2 chieu a[100][30] chua cac word cua mot string s.

{

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

while(s[i]!='\0')

{

k=0;

while(s[i]!=' '&&s[i]!='\0')

{

a[j][k]=s[i]; i++; k++;

}

if(s[i]!='\0') i++;

a[j][k]='\0'; j++;

}

n=j;

}

//

void Uppercase(char a[][30],int n,char s[])

{

char x[30];

int i,j,k; for(i=0;i<=n-2;i++)

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

{

k=strcmp(a[i],a[j]);

if(k>0) { strcpy(x,a[i]); strcpy(a[i],a[j]); strcpy(a[j],x);}

}

strcpy(s,a[0]); for(i=1; i<=n-1;i++)

{

strcat(s," "); // s=s+' ';

strcat(s,a[i]); // s=s+a[i];

}

}

//

void fun(int tc, char s[]) // Complete this function

{// Write your statements here char a[100][30];

int n,i; split(s,a,n);

//

if(1==tc) // doi chu dau tien thanh chu in HOA.

{

int k=strlen(a[0]);

for(i=0;i<=k-1;i++) if(a[0][i]<='z'&&a[0][i]>='a') a[0][i]=a[0][i]-32; strcpy(s,a[0]);

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

{

strcat(s," "); // s=s+' ';

strcat(s,a[i]); // s=s+a[i];

}

}

else // Xoa cac chu co chu cai dau la in HOA.

{

strcpy(s,""); for(i=0;i<=n-1;i++)

{

if(a[i][0]>='a'&&a[i][0]<='z')

{

strcat(s," ");

strcat(s,a[i]);

}

}

for(i=0;s[i]!='\0';i++) s[i]=s[i+1]; // xoa dau cach dau tien

}

}

int main() { // Do not edit this function

// system("cls");

printf("\nTEST Q3 (2 marks):\n"); int tc;

char s[100];

printf("Enter tc (1 or 2) = "); scanf("%d",&tc);

input(s);

printf("\nThe original string:\n"); display(s);

printf("\nThe string after processing:\n");

fun(tc,s); display(s);

//OUTPUT for marking: printf("\nOUTPUT:\n"); display(s);

printf("\n");

system ("pause"); return(0);

}

========================================================

### Question 1: (2 marks)

The given file Q1.cpp already contains statements to input data for 3 variables a, b and c. You should write statements to sort these numbers in ascending order (see sample output).

### Notes:

* You can create new function(s) if you see it is necessary.
* Do not edit given statements in the **main** function.

### Sample output:

#include <stdio.h> #include <stdlib.h>

int main()

{ system("cls");

printf("\nTEST Q1 (2 marks):\n"); int a, b, c,temp;

printf("Enter a = "); scanf("%d",&a);

printf("Enter b = "); scanf("%d",&b);

printf("Enter c = "); scanf("%d",&c);

//============================================================

// Write your statements here if(a>b) {temp=a; a=b; b=temp;} if(a>c) {temp=a; a=c; c=temp;} if(b>c) {temp=b; b=c; c=temp;}

//====DO NOT ADD NEW OR CHANGE STATEMENTS AFTER THIS LINE====

printf("\nOUTPUT:\n"); printf("%d %d %d\n",a,b,c); printf("\n");

system ("pause"); return(0);

}

========================================================

### Question 1: (2 marks)

The given file Q1.cpp already contains statements to input data for 3 variables a, b and c. You should write statements to sort these numbers in descending order (see sample output).

### Notes:

* You can create new function(s) if you see it is necessary.
* Do not edit given statements in the **main** function.

### Sample output:

========================================================

### Question 2: (2 marks)

The given file Q2.cpp already contains statement to input data for variable n. Suppose a user always enter n > 1. You should write statement to calculate the sum:

1

s = 1+ 2 +

### Notes:

1

## 4 +...+

1

## *m* , where m = n if n is even, m = n-1 if n is odd

* You can create new function(s) if you see it is necessary.
* Do not edit given statements in the **main** function.

### Sample output:

#include <stdio.h> #include <stdlib.h>

int main()

{system("cls");

printf("\nTEST Q2 (2 marks):\n"); int i,n;double s;

printf("Enter n = "); scanf("%d",&n);

//============================================================

// Write your statements here i=2; s=1;

while(i<=n)

{

s=s+(double)1/i; i=i+2;

}

//if(n%2==0) s=s+(double)1/n;

//-

printf("s = %.4f\n",s);

//====DO NOT ADD NEW OR CHANGE STATEMENTS AFTER THIS LINE====

printf("\nOUTPUT:\n"); printf("%.4f\n",s);

printf("\n");

system ("pause"); return(0);

}

========================================================

### Question 3: (2 marks)

The given file Q3.cpp already contains statement to input data for the variable m. Suppose a user always enter m

> 1. You should write statements to find the first n, for which the sum s > m, where: s = 1+2+3+… + n

### Notes:

* You can create new function(s) if you see it is necessary.
* Do not edit given statements in the **main** function.

### Sample output:

#include <stdio.h> #include <stdlib.h>

int main()

{system("cls");

printf("\nTEST Q3 (2 marks):\n"); int m,n, s;

printf("Enter m = "); scanf("%d",&m);

//============================================================

// Write your statements here n=0; s=0;

while(s<=m)

{

n++;

s=s+n;

}

//-

printf("sum = %d\n",s); printf("n = %d\n",n);

//====DO NOT ADD NEW OR CHANGE STATEMENTS AFTER THIS LINE====

printf("\nOUTPUT:\n"); printf("%d\n",n);

printf("\n");

system ("pause"); return(0);

}

========================================================

========================================================

========================================================

========================================================