1. A positive integer is entered through the keyboard, write a program to obtain the prime factors of the number. Modify the function suitably to obtain the prime factors recursively.

For example, prime factors of 24 are 2, 2, 2 and 3, whereas prime factors of 35 are 5 and 7.

int main()

{

int x,i=2,temp;

printf("Please input a positive integer:\n");

scanf("%d",&x);

temp=x;

while(i<=x)

{

if(x%i==0)

{

if(i==temp)

{

printf("It's a prime integer.\n");

break;

}

printf("%d ",i);

x=x/i;

}

else

i++;

}

return 0;

}

OUTPUT

**Please input a positive integer:**

200

**2 2 2 5 5**

**Please input a positive integer:**

17

**It's a prime integer.**

1. What would be the output of the following programs and why (write explanation)

(a)

main( )

{

int i = 5, j = 2 ;

junk ( i, j ) ;

printf ( "\n%d %d", i, j ) ;

}

junk ( int i, int j )

{

i = i \* i ;

j = j \* j ;

}

output: 5 2

(b)

main( )

{

int i = 5, j = 2 ;

junk ( &i, &j ) ;

printf ( "\n%d %d", i, j ) ;

}

junk ( int \*i, int \*j )

{

\*i = \*i \* \*i ;

\*j = \*j \* \*j ;

}

output: 25 4

(c)

main( )

{

int i = 4, j = 2 ;

junk ( &i, j ) ;

printf ( "\n%d %d", i, j ) ;

}

junk ( int \*i, int j )

{

\*i = \*i \* \*i ;

j = j \* j ;

}

output: 16 2

(d)

main( )

{

float a = 13.5 ;

float \*b, \*c ;

b = &a ; /\* suppose address of a is 1006 \*/

c = b ;

printf ( "\n%u %u %u", &a, b, c ) ;

printf ( "\n%f %f %f %f %f", a, \*(&a), \*&a, \*b, \*c ) ;

}

output:

1006 1006 1006

13.5 13.5 13.5 13.5 13.5

3. What would be the output of the following programs and why (write explanation)?

(a)

main( )

{

int i = 0 ;

i++ ;

if ( i <= 5 )

{

printf ( "\nC adds wings to your thoughts" ) ;

exit( ) ;

main( ) ;

}

}

Answer:

C adds wings to your thoughts

(It’s only executed once because if condition will be break by exit).

(b)

main( )

{

static int i = 0 ;

i++ ;

if ( i <= 5 )

{

printf ( "\n%d", i ) ;

main( ) ;

}

else

exit( ) ;

}

answer: 1 2 3 4 5

(c)

int main()

{

    static int x;

    int y;

    printf("%d \n %d", x, y);

}

Answer: 0 1

But I don’t know why.

(d)

int initializer(void)

{

    return 50;

}

int main()

{

    static int i = initializer();

    printf(" value of i = %d", i);

    getchar();

    return 0;

}

Answer: value of i=0

(It seems that the origin value of static int is 0, and the return value does not pass via fuction )

1. Observe the difference b/w two program outputs and find the reason:

|  |  |
| --- | --- |
| int fun()  {    static int count = 0;    count++;    return count;  }    int main()  {    printf("%d ", fun());    printf("%d ", fun());    return 0;  }  output: 1 2 | int fun()  {    int count = 0;    count++;    return count;  }    int main()  {    printf("%d ", fun());    printf("%d ", fun());    return 0;  }  output: 1 1 |