Seat Number

KING MONGKUT's UNIVERSITY OF TECHNOLOGY THONBURI
Computer Engineering Department
Final Examination, First Semester 2015

November 27, 2015 13:00-16:00
CPE 100 Computer Programming for Engineers. AE's the first year Students

Instructions

1. This is a close book exam. There are totally 6 questions in 13 pages.
2. The answers must be written in the space and blank space provided.
3. All questions have the same score point, please do them all.
4. Any electronic device is not allowed.
5. Please read every question carefully before answer it.
6. Please write your name and your student number on every page.

Jumpol Polvichai, Ph.D.
Instructor

This examination has been approved by the department of computer engineering.

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## Reference

#include <directive>
directive : stdio.h conio.h math.h string.h

Type of data
char int long int float double

Arithmetic Operator
+ - * / %
++ - -

Math Functions
sin(x) cos(x) tan(x) asin(x) acos(x) atan(x)
sqrt() pow(x,y) log(x) exp(x) log10(x) abs(x)

Input Functions
int scanf("control string", address of arguments list);
char *gets(char *str);
int getch(void);
int getche(void);

Output Functions
printf("control string " , arguments list ) ;
Control string : %[[-]width][.decimal] code
%f %lf %e %d %ld %s %c %p

Relational Operators
== != > < >= <=

Logical Operators
! || &&

Conditions Statement
if (condition) {statement list1; } else {statement list2; }

Repetitive Loop
for (initialization ; continue condition ; increment) { statement list; }
do { statement list; } while (continue condition) ;
do { statement list; } while (continue condition);

Referencing & Dereferencing Operator
& (Address-of) * (Value at-address)

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Answering space for the problem question 1.

| 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 1.10 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**1.** Please select correct answers and write your answers in the above space. (20 points)

1.1) Values store in a[ ][ ] after this program is executed

```
int a[3][4];
int i, j;
        for(i=0; i<3; i++)
                for(j=0; j<4; j++)
                        a[i][j] = i*j;
```

| 1) | 2) | 3) | 4) |
|---|---|---|---|
| 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 |
| 0 0 0 0 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 |
| 0 1 2 3 | 0 2 3 6 | 0 1 4 6 | 0 2 4 6 |

1.2) Let a program is as follow..

```
int i = 8 ; int x[10]; int count;
        x[1] = 1 ; x[2] = 1 ;
        for (count = 3; count<= i; count++)
                x[count] = x[count – 1] + x[count - 2];
```

If a computer is executed with this program, which one is true?

1) x[2] has value 3 2) x[3] has value 3 3) x[4] has value 3 4) x[5] has value 3

1.3) if we define int num[5] = {8,12,20,5,40};

Which choice is the answer of y, when int y = num[1] * num[3] - num[4]; ?

1) num[0]

2) num[1]

3) num[2]

4) num[3]

1.4) Let A[0..N] is an array one dimension with size N+1, what following part of program will do?

```
int M = A[0]; int K;
for (K = 1; K <=N; K++)
        { if (M < A[K])  M = A[K]; }
```

1) find maximum value of A[0..N]

2) find minimum value of A[0..N]

3) find out that is there any value that less than M or not

4) find out that is there any value that more than M or not

1.5) Let A[0..N] is an array one dimension with size N+1, and

A[0]=0;A[1]=1; A[2]=2; ... A[N]=N;

When this part of following program stop, what the value of A[5]?

```
int K; int N=8;
for (K = 2; K <=N; K++)
        { A[K] = A[K-1] + A[K]; }
```

1) 5 2) 9 3) 11 4) 15

1.6) if we define ...

```
int a[4] = {3,5,7,2};
int b[4] = {1,9,9,1};
```

What the value of b[a[3]] + a[b[3]] ?

1) 10 2) 12 3) 14 4) 16

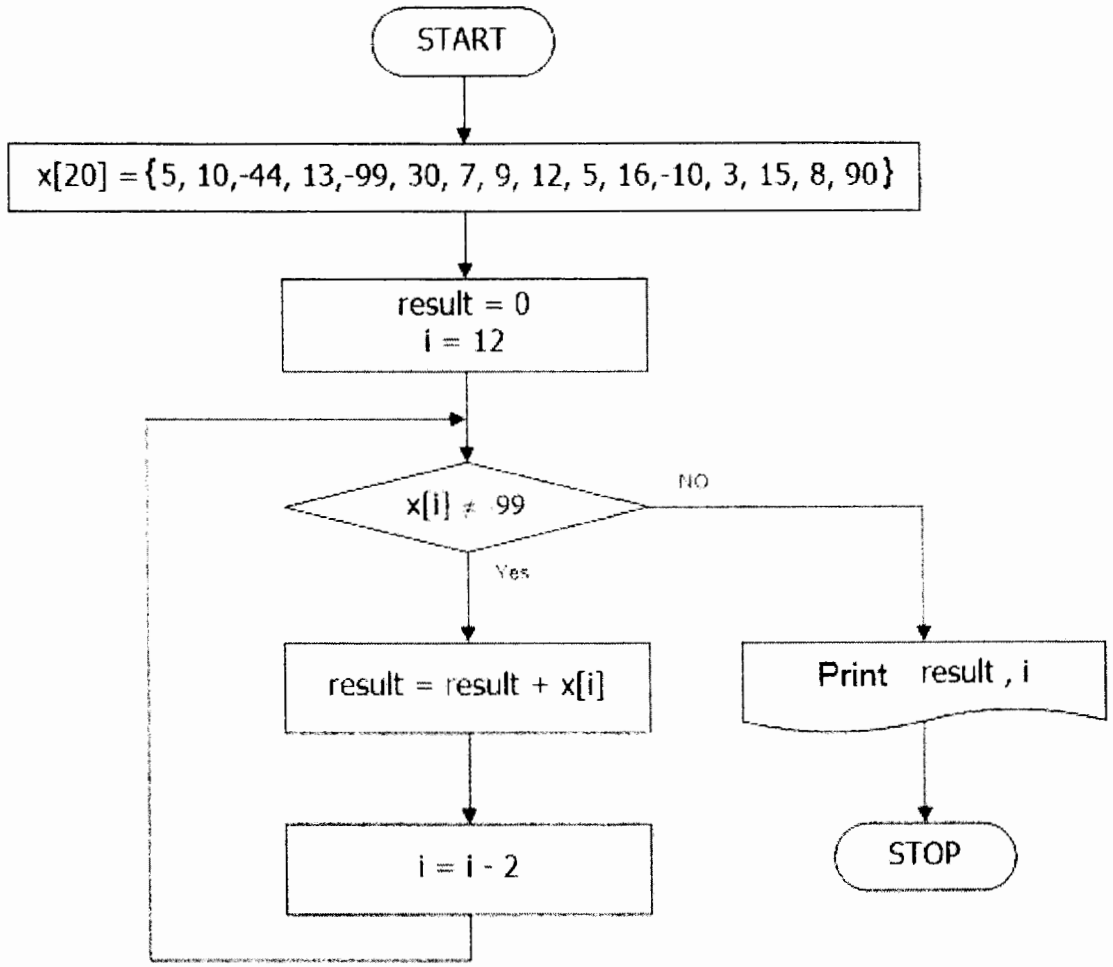
1.7) Let n=6;

```
int i = n; int x[7] = {1,2,3,4,5,6,7}; int t;
while (i > 0) {
        t = x[i];
        x[i] = x[n-i+1];
        x[n-i+1] = t;
        i = i - 1;
}
```

What are the values of x[] after the execution?

1) {1,1,1,1,1,1,1} 2) {1,2,3,4,5,6,7} 3) {7,6,5,4,3,2,1} 4) {7,7,7,7,7,7,7}

1.8) From this Flow Chart, after finishing the execution of this program, please find values of result , i and how many loop



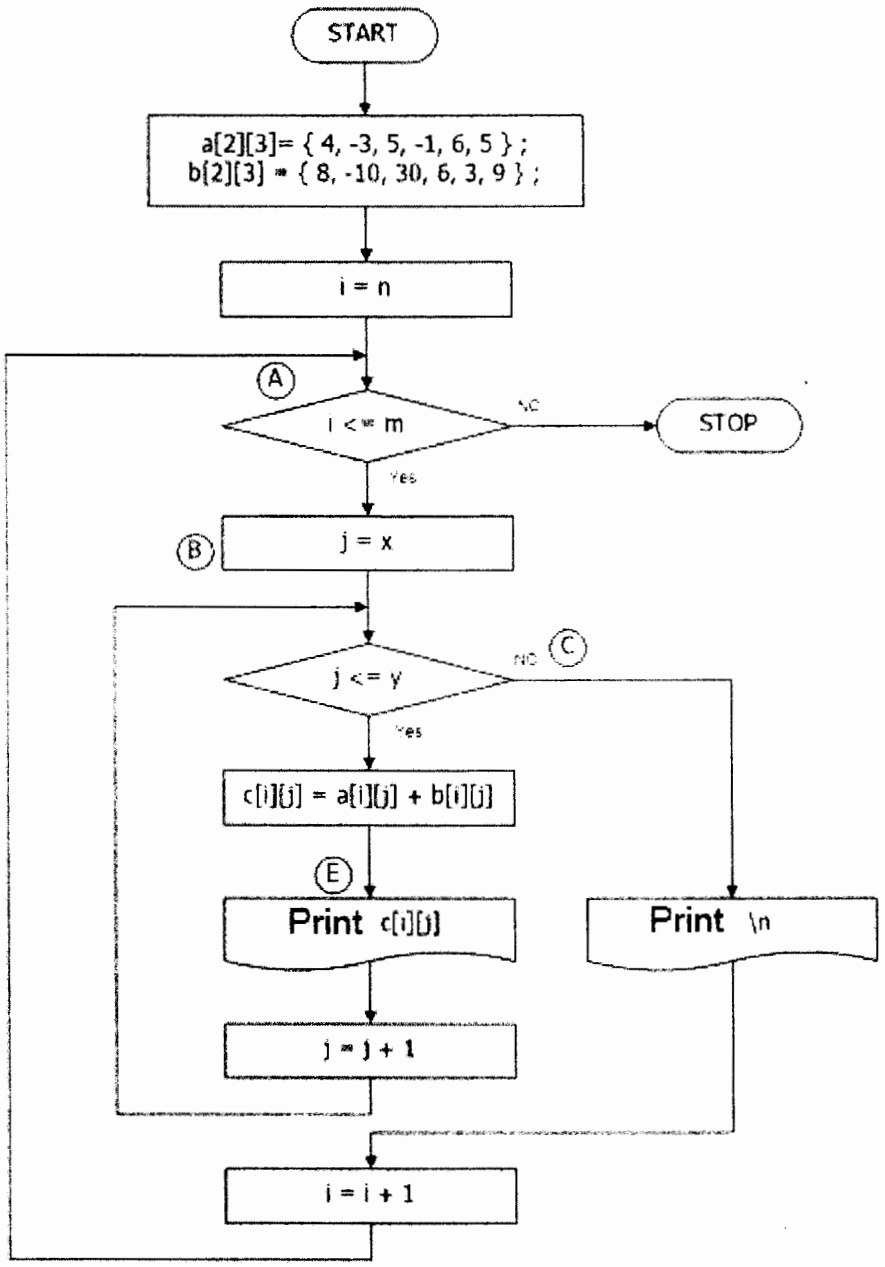

1) result = 38 ; i= 4 ; loop 4 times

2) result = 38 ; i= 5 ; loop 4 times

3) result = 38 ; i= 4 ; loop 5 times

4) result = -99 ; i= 5 ; loop 4 times

1.9)




From the Flow Chart, after the execution of this program, please compute values of this matrix, and number of loop at all points of A,B,C,E. When the program starts at a[0][0] and b[0][0] by n=0, m=1, x=0, y=2.

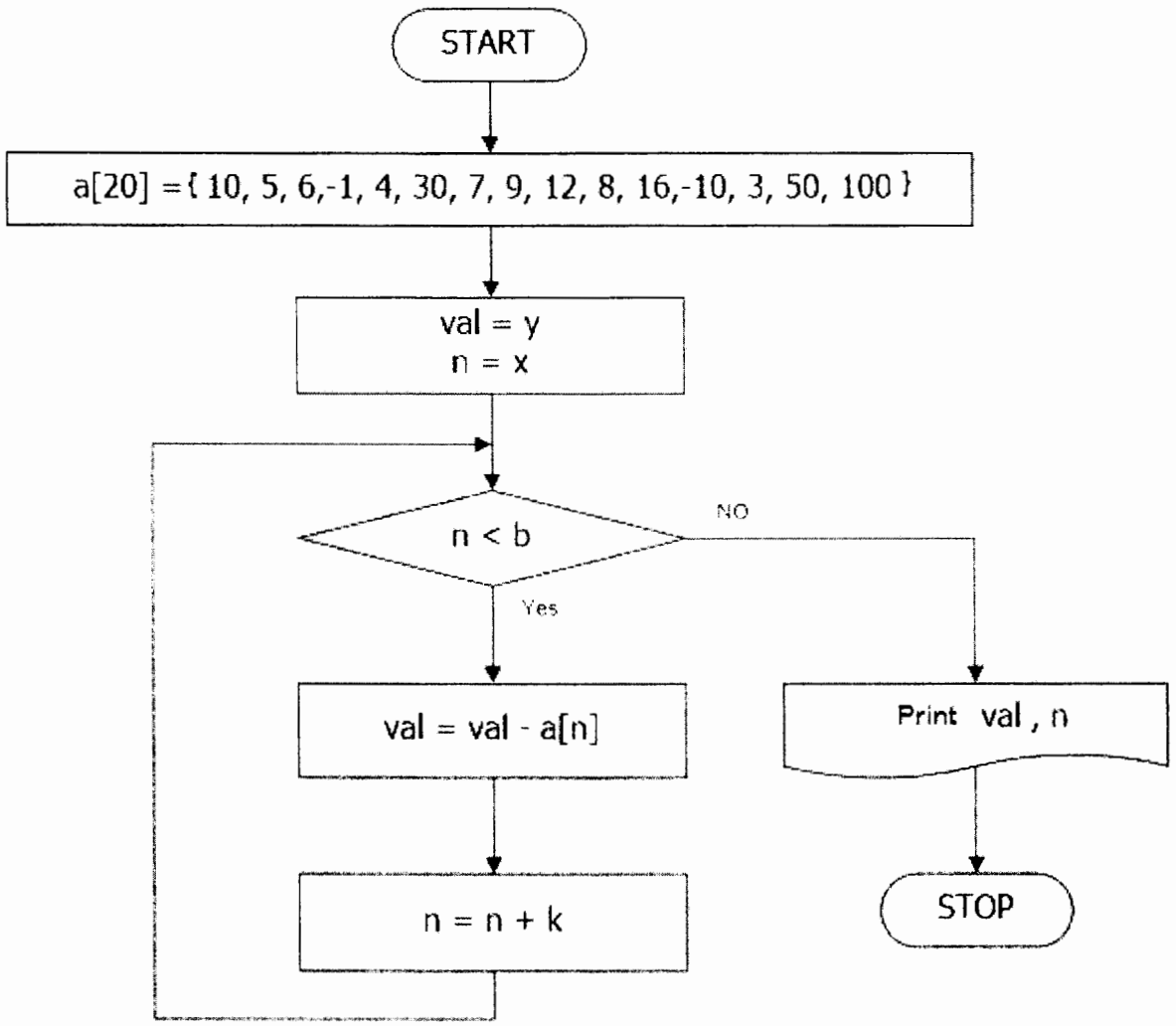
1) C[2][3]={12,-10,35,5,9,14} Loop at A = 2 times, at B =2 times, at C=2 times , at E =6 times

2) C[2][3]={12,-13,35,5,9,14} Loop at A = 2 times, at B =2 times, at C=2 times, at E =6 times

3) C[2][3]={12,-13,35,5,9,13} Loop at A = 2 times, at B =2 times, at C=3 times, at E =7 times

4) C[2][3]={12,-7,35,5,9,14} Loop at A = 2 times, at B =2 times, at C=2 times, at E =7 times

1.10) From this Flow Chart below, please find values of val , n and number of loop, after the execution of this program when start at a[0] with y =100; x = 2; k=3; b=10;




1) value of val = 75, n = 11, loop 3 times

2) value of val = 52, n = 11, loop 3 times

3) value of val = 52, n = 10, loop 4 times

4) value of val = 75, n = 10, loop 4 times

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2. Please write only Function Prototype by the conditions as follows... (20 points.)

2.1 Function name: Get_Integer without parameter and Return Answer : char

.....

.....

2.2 Function name: Slope with 4 input parameters as x1, y1, x2 and y2 which are integer type and Return Answer : real number

.....

.....

2.3 Function name: Plotxy with 2 input parameters as x and y which are integer type and Return Answer : none

.....

.....

2.4 Function name: Check_remember with an input parameters as z which is integer type and Return Answer : integer number

.....

.....

2.5 Function name: Transform with 3 input parameters as x, y, and z which are integer type and Return Answer : none but using parameter x and y to return answer.

.....

.....

2.6 Function name: Convert with 3 input parameters as x, y, and z which are real number type and Return Answer : integer number and also using parameter x and z to return answer.

.....

.....

3. Assume that we have a data consisting of "ProductCode ProductName PricePerUnit RemainingAmount" keeping in a TEXT FILE named "STOCK.TXT".

3.1 Please define a structure data type for using with this data consisting of "ProductCode ProductName PricePerUnit RemainingAmount". (5 points)

```
struct   stock_info  { ..... ;
                       ..... ;
                       ..... ;
                       ..... ;
                       ..... ; } item_type;
int  itemcount;
item_type   item[1000] ;
```

3.2 Please write a sub program for reading all data from the file "STOCK.TXT" then transfer them to keep in a variable named item[ ] starting from 1 by counting all records from file to return the final counting back by the function. (5 points)

```
int  read_stock_file ( );
int  read_stock_file ( )
{    .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
     .....
}
```

3.3 Please write a sub program for searching and displaying a list of all products that have a remaining amount less than 12 quantities (5 points)

```
void  list_stock_order ( );
void  list_stock_order ( )
{   .....
    .....
    .....
    .....
    .....
    .....
}
```

3.4 Please write a sub program to display the total prices of all products in the stock and then return back that number by the function. (5 points)

```
double  total_stock_price();
double  total_stock_price()
{   .....
    .....
    .....
    .....
    .....
    .....
}
```

3.4 Please write the main() function for reading all data from the file and computing the total prices of all products remain in the stock then display this total prices by using the previous sub programs. (10 points)

```
void main()
{   .....
    .....
    .....
    .....
    .....
    .....
}
```

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**4.** Considering a program that computes an electrical bill for a month using an electrical machine which has conditions as follows...

- The program has to ask question for electric power of the equipment (Watts)
- Compute a derived unit of energy (units) by assuming that this machine is used 12 hours a day for 30 days a month (1 Unit = 1000 Watts-hr)
- Compute the electrical cost to pay by assuming that the value of electrical unit is 4 baht.

Please fill in Function Prototype and Details Functions that missing (10 points)

```
#include <stdio.h>
#include <conio.h>
.....
.....
.....
.....
.....
.....
.....
.....
.....
void  main ()
{ double W, Units, Cost  ;
    clrscr();
    printf("\nEnter Watts :");
     scanf("%lf",&W);
    Calculate_total_Electrical_Power ( W , &Units, &Cost );
    printf("\nTotal Consumptions units per months = %lf Units" , Units ) ;
    printf("\nTotal Cost per months = %4.2lf Baht " , Cost ) ;
    getch();
}
```

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**5.** Assuming that a data of 9 numbers keeping in a two dimension array of 3*3 as A[][] is defined. Please write a sub program to compute an averaged value of all nine numbers in this array, the averaged value which is in double data type have to return back by the function (10 points)

```
double   Average_array (int A[ ][ ]) ;
double   Average_array (int A[ ][ ])
{ int  i, j ;
  double sum = 0.0, mean ;
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
}
```

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6. Please learning a program below, then explain whether what intention of this program is. However this program is not perfect as its intention, please find what can be improved and corrected. (20 points)

```
#include<stdio.h>

void main()
{
   FILE *fp,*fp1;
   char word[10000];
   int i=0;

   fp=fopen("xxxx.txt","r");
   fp1=fopen("yyyy.txt","w");

   while (!feof(fp))
   {
         fscanf(fp,"%c",&word[i]);
         if(word[i] == ' ' || word[i]=='\n')
         {
                  fprintf(fp1,"%c\n",word[i]);     i++;
         }
         else if (((word[i]>='a') && (word[i]<='z')) || ((word[i]>='A') && (word[i]<='Z')))
         {
                  fprintf(fp1,"%c",word[i]);
         }
   }
   fclose(fp);
   fclose(fp1);
}
```

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