Introduction to Informatics

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Labor 08

printf()

Syntax

- **printf** (“format string”, argument list);

Example

printf (“Hello world!”);
/*displays the Hello World! text */

printf (”a=%d\nb=%d”,a,b);
/*displays the values of a and b variables*/

scanf()

Syntax

scanf (“Formatted _specifier”, & variable_ name)

& (Address Operator)

Example

scanf(”%d”,**&**a);

scanf(”%d %d”,&a,&b);

scanf(“%d %f”, &i, &j);

Statements

Empty statements

Syntax can be of two types:
;
{}

Semantics:
It does not do anything, but we may needed for syntactic purposes.

Statements

Syntax

expression;

Semantics

Execution of the expression.

Examples:

- printf("Hello World!\n");
- x = 2;

IF statement

- if (condition)
  statement;

- if (condition)
  {
  statement 1;
  statement 2;
  }

IF ELSE statement

- if (condition)
  statement1
  else
  {
  statement 2;
  statement 3;
  }

IF-ELSE-IF statement

- if (condition)
  statement 1;
  else if (condition)
  statement 2;
  .....
  .....
  else if (condition)
  statement n-1;
  else
  statemens n ;

Example

```
if (x%2==0)
        {
        printf("x is an even number");
        }
else
      {
      if (x>10)
                {
                printf("x is an odd number and greater than 10");
                }
      else
                {
                printf("x is an odd number and less than 10");
                 }
      }
```

Exercise

1. Write a program which determines if the input number is even or odd.

Solution

```
#include <stdio.h>
int main()
{
int x;
printf(”x=”);
scanf(”%d”,&x);

if (x %2==0)
        printf(”%d is even.\n”,x);
else
        printf(”%d is odd.\n”,x);

return 0;
}
```

Exercise

- Write a program which determines if a triangle can be constructed from three segments. If it is possible, give the area of the triangle.

Solution

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
int main()
{
float a, b, c, p, T;
printf("a="); scanf("%f",&a);
printf("b="); scanf("%f",&b);
printf("c="); scanf("%f",&c);
if (a<b+c && b<a+c && c<a+b)
            {
                        printf("The triangle can be contructe!\n");
                        p=(a+b+c)/2;
                         T= sqrt(p*(p-a)*(p-b)*(p-c));
                         printf("The area of the triangle is %.2f",p, T);

else
                        printf("The triangle can not be contructe!\n");
return 0;
}
```

Exercise

Write a program, which evaluates a test on the basis of the obtained points.

Example

point <0 or point>100 default value!
point<=20 Failed!
point<=40 Grade is 2!
point<=60 Grade is 3!
point<=80 Grade is 4!
point<=100 Grade is 5!

Switch statements

- switch (expression)

```
{
 case constant1: statements 1;
 case constant2: statements 2; break;
  ……..
 case constantn-1: statements n-1;
 default: statements n;
}
```

Exercise

Write a program, which qualifies the test on the basis of the obtained points. The points can be between 1 to 5, integer numbers [1,5].

Example

point=1 Failed!

point=2 D level!

point=3 C level!

point=4 B level!

point=5 A level!

point<1 or point>5 Default value!

Exercise

- Write a program which inputs two integer numbers and an operation symbol (+,-,*,/). On the basis of the operation symbol calculate the result. Give an error message if the operation is not what we have listed or in case of the division the denominator is zero. (switch)

Solution

```
char op;
int a, b, res;
scanf("%d%c%d", &a, &op, &b);
    switch (op) {
    case '+': res = a + b;  break;
    case '-':  res = a - b;  break;
    case '*':  res = a * b;   break;
    case '/': if (b == 0)
            printf(”Error: Division by zero!");
        else
            res = a / b; break;
    default:
        printf(”Default operation symbol!");
    }
    printf(”Result:%d", res”);
```