Lecture 5

By Hafijur Rahman

Sample Program

```
#include<stdio.h>

void main()
{
    char line[80];
    scanf("%[^\n]",line);

    printf("%s",line);
}
```

Input: Mechanical Engineering
Output: Mechanical Engineering

Sample Program

```
#include<stdio.h>

void main()
{
    char line[80];
    scanf("%s",line);

    printf("%s",line);
}
```

Input: Mechanical Engineering
Output: Mechanical

gets() and puts() FUNCTION

General format

gets(string name);
puts(string name);

```
#include<stdio.h>
void main()
{
char dept[25];
printf("Enter your Department Name:\n");
gets(dept);   //"Mechanical Engineering"
puts(dept);
}
```

Enter your Department Name:

Mechanical Engineering – gets()

Mechanical Engineering – puts()

getchar() and putchar() FUNCTION

Sample Program

```
void main()
{
char a;
printf("Enter your Department Name:\n");
a=getchar();
putchar(a);
}
```

Enter your Department Name:

ME

M

Conditional code

- The if statement
- The if …. else statement
- The if ….. else if …. else statement

The *if* statement

General form:

```
if (condition)
{
        statement;
}
```

Note: result of the condition is always wither true(1) or false(0)
Example:

1>2   Ans: 0
1<2   Ans: 1
1==2   Ans: 0

If the value of the condition is any positive or negative number except 0 or 1, it always consider that number as a true value(1);

Conditions:
1. Using relational or conditional operators
2. Using logical operators

Relational or conditional operators
1. == means 'is equal to'
2. != means 'is not equal to'
3. < means 'is less than'
4. > means 'is greater than'
5. <= means 'is less than or equal to'
6. >= means 'is greater than or equal to'

logical operators
1. && means 'AND'
2. || means 'OR'
3. ! means 'NOT'

Example of the if statement

```
#include <stdio.h>
void main(void)
{
int a=5;
if(a>0)
printf("a is positive");
}
```

Multiple statements within *if*

General form:

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

Example 1

Write a C program using simple if statement to   calculate the salary earned by a worker such that-

- if worked up to 20 hours then paid at 500$@hours
- if worked more than 20 hours a bonus worth 1000$ will be given .

Your program should take total hours worked as input

Code of Example 1

```c
#include<stdio.h>
void main()
{
    int hrs, salary;
    salary = 0;
    printf("How many hours have you worked: ");
    scanf("%d",&hrs);
    salary = hrs*500;
    if (hrs>=20){
        salary = salary + 1000;
        printf("\nYou got Tk.1000 as bonus.");
    }
    printf("\n\nYour salary is %d", salary);
}
```

if-else   *if-else if-else*

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

else
{
        statement 1;
        statement 2;
}
```

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

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

else
{
        statement 1;
        statement 2;
}
```

Examples

```
#include <stdio.h>

void main(void)
{
int a=5;
if(a>0)
printf("a is positive");
else
printf("a is negative");
}
```

```
#include <stdio.h>

void main(void)
{
int a=5;
if(a>0)
printf("a is positive");
else if (a<0)
printf("a is negative");
else
printf("a is equal");
}
```

Note: else is optional

Nested *if-else* statements

```
if (condition)
{
        statement;
}

else
{
        if (condition)
        {
          statement;
        }

        else
        {
         statement;
        }
}
```

```
if (condition)
{
        if (condition)
        {
                statement;
        }
        else
        {
                statement;
        }
}

else
{
     statement;
}
```

Example 2 (Nested if-else)

Write a C program to find the smallest of 3 integers   taken   as input using nested if-else statement .

Example 2

```
#include<stdio.h>
void main ()
{
        int   a,b,c;
        printf("\nEnter three integer numbers: ");
        scanf("%d%d%d",&a,&b,&c );
        if (a<b)
        {       if (a<c)
                printf("%d is smallest\n",a);
                else
                printf("%d is smallest\n",c);

        }
        else
        {       if (b<c)
                printf("%d is smallest\n",b);
                else
                printf("%d is smallest\n",c);

        }
}
```

Example 3

Write a C program to find the roots of a Quadratic Equation $ax^2+bx+c =0$, that will take coefficients a, b, c as input and find the roots as output.. Use nested if-else statement.

Code of Example 3

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

void main (void)
    {
            float  a, b, c, root1, root2, discr;
            printf("\nEquation is   ax2 + bx + c = 0");
            printf("\nEnter the coefficients a, b, c \n");
            scanf("%f%f%f",&a, &b, &c );
            discr = b * b – 4.0 *a * c;
        if (discr == 0.0) {                     // equal roots
                root1 = – b / ( 2.0 * a);
                printf("\nEqual roots are %.2f",root1);
    }
```

Contd….

```
else{
    if (discr > 0.0)                       // two real roots
      {
        discr = sqrt(discr);
        root1 = ( – b + discr ) / ( 2.0 * a );
        root2 = ( – b – discr ) / ( 2.0 * a );
        printf("\nRoots are %f  and %f",root1, root2);
        }
        else{                              // complex roots
        discr = sqrt(– discr);
        printf("\nComplex Roots are %f + or – i %f ",–b/(2.0*a), discr);
        }
        }
}
```

THANKS