



### M3 Conditional Statement-I

Mr. J. Mishra  
MGCUB, INDIA

Objectives

Introduction

*if* Statement

Multiple *if*  
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*if ...else*  
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Ladder *if ...else*  
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Nested *if ...else*  
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References

## Conditional Statement-I

Course: BTech in CSE

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Mr. Joynath Mishra

Assistant Professor (Guest)

Department of Computer Science and Information Technology

Mahatma Gandhi Central University  
Bihar, INDIA

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# Outline

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# Objectives

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### Objectives

- Study on different type of *if else* statements
- Study on ladder and nested type of *if else* statement



# Introduction[1],[2]

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- Control of statements to any problem solution
- Execution sequence/block is controlled by control statement
- Conditional statements are written in form of *if ...else* statement or *switch ...case* statement

### Example

A university has following rules for grading system:

- 1 Below and 50 : F
- 2 50 to 59 : D
- 3 60 to 69 : C
- 4 70 to 79 : B
- 5 80 to 89 : A
- 6 90 and above : E

Ask end-user to enter marks and display the corresponding grade.



# *if* Statement

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### *if* Statement Syntax (Single Statement)

```
1 if ( expression )  
2     statement_1;
```

### *if* Statement Syntax (Multiple Statement)

```
1 if ( expression )  
2 {  
3     statement_1;  
4     statement_2;  
5 }
```



# if Statement (Contd...)

## Example 1

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### if Statement (Single Statement)

```
1 #include<stdio.h>
2 #include<math.h>
3 int main()
4 {
5     int x;
6     double sqr;
7     printf("Please enter a value:\t");
8     scanf("%d", &x);
9
10    if(x>0)
11        sqr = sqrt(x);
12
13    printf("Squareroot of %d is %.2f", x, sqr);
14    return 0;
15 }
```

### Output

```
Please enter a value: 34
Squareroot of 34 is 5.83
```



# if Statement (Contd...)

## Example 2

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### if Statement (Multiple Statement)

```
1  /* Discount is calculated based on total amount
2  If total amount is greater than 2000, then discount is 5%.
3  Finally display payable amount.*/
4
5  #include<stdio.h>
6  int main()
7  {
8      float totalamount, discount;
9      printf("Please enter total amount:\t");
10     scanf("%f", &totalamount);
11
12     if( totalamount > 2000 )
13     {
14         discount = 0.05 * totalamount;
15         totalamount = totalamount - discount;
16     }
17
18     printf("Total Payable amount:\t%4.2f", totalamount);
19     return 0;
20 }
```

### Output

```
Please enter total amount: 5000
Total Payable amount: 4750.00
```



# Multiple *if* Statement

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### Multiple *if* Statement Syntax (Single Statement)

```
1 if ( expression_1 )
2   statement_1;
3 if ( expression_2 )
4   statement_2;
```

### Multiple *if* Statement Syntax (Multiple Statement)

```
1 if ( expression_1 )
2 {
3   statement_1;
4   statement_2;
5 }
6 if ( expression_2 )
7 {
8   statement_3;
9   statement_4;
10 }
```





# Multiple *if* Statement (Contd...)

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### *if* Statement (Single Statement)

```
1  /*Display largest number among three number*/
2  #include<stdio.h>
3  int main()
4  {
5      int a, b, c;
6      printf("Please enter three values: \t");
7      scanf("%d%d%d", &a, &b, &c);
8      if(a>b && a>c)
9          printf("Largest value: %d", a);
10     if(b>a && a>c)
11         printf("Largest value: %d", b);
12     if(c>b && c>a)
13         printf("Largest value: %d", c);
14     return 0;
15 }
```

### Output

Please enter three values: 4 2 8  
Largest value: 8



# Multiple *if* Statement (Contd...)

## Example 2

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### *if* Statement (Multiple Statement)

```
1  /*Display largest number among three number*/
2  #include<stdio.h>
3  int main()
4  {
5      int a, b, c, largest;
6      printf("Please enter three values: \t");
7      scanf("%d%d%d", &a, &b, &c);
8      if(a>b && a>c)
9      {
10         largest = a;
11         printf("Largest value: %d", a);
12     }
13     if(b>a && a>c)
14     {
15         largest = b;
16         printf("Largest value: %d", b);
17     }
18     if(c>b && c>a)
19     {
20         largest = c;
21         printf("Largest value: %d", c);
22     }
23     return 0;
24 }
```

### Output

Please enter three values: 4 2 8  
Largest value: 8



# *if ...else* Statement

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### *if ...else* Statement Syntax (Single Statement)

```
1 if ( expression_1 )  
2     statement_1;  
3 else  
4     statement_2;
```

### *if ...else* Statement Syntax (Multiple Statement)

```
1 if ( expression )  
2 {  
3     statement_1;  
4     statement_2;  
5 }  
6 else  
7 {  
8     statement_3;  
9     statement_4;  
10 }
```



# if ...else Statement

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### if ...else Statement (Single Statement)

```
1  /* Discount is calculated based on total amount
2  If total amount is greater than 2000, then discount is 5% */
3
4  #include <stdio.h>
5  int main()
6  {
7      float totalamount, discount;
8      printf("Please enter total amount:\t");
9      scanf("%f", &totalamount);
10
11     if( totalamount > 2000 )
12         discount = 0.05 * totalamount;
13     else
14         discount = 0;
15
16     printf("Discount value:\t%.2f", discount);
17     return 0;
18 }
```

### Output

```
Please enter total amount: 5000
Discount value: 250.00
```



# if ...else Statement

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### if ...else Statement (Multiple Statement)

```
1  /*Receive age of any person and display eligibility for vote.
   */
2
3  #include <stdio.h>
4  int main()
5  {
6      int age ;
7      printf("Enter your age ");
8      scanf("%d",&age);
9      if (age >= 18 )
10     {
11         printf ("Your age is 18+.\n");
12         printf ("Eligible to vote\n");
13     }
14     else
15     {
16         printf("Your age is not yet 18.\n");
17         printf("Not eligible to vote\n");
18     }
19     return 0;
20 }
```

### Output

```
Enter your age 35
Your age is 18+.
Eligible to vote
```



# Ladder *if ...else* Statement

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### *if ...else* Statement Syntax (Single Statement)

```
1 if( expression_1 )
2     statement_1;
3 else if( expression_2 )
4     statement_2;
5 else if( expression_3 )
6     statement_3;
7 else
8     statement_4;
```



# Ladder *if ...else* Statement (Contd...)

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### *if ...else* Statement Syntax (Multiple Statement)

```
1  if( expression_1 )
2  {
3      statement_1;
4      statement_2;
5  }
6  else if( expression_2 )
7  {
8      statement_3;
9      statement_4;
10 }
11 else if( expression_3 )
12 {
13     statement_5;
14     statement_6;
15 }
16 else
17 {
18     statement_7;
19     statement_8;
20 }
```



# Ladder *if ...else* Statement (Contd...)

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### *if ...else* Statement Syntax (Multiple Statement)

```
1  /*Display largest number among three integer values.*/
2
3  #include<stdio.h>
4  int main()
5  {
6      int a,b,c,largest;
7      printf("Please enter three number:\t");
8      scanf("%d%d%d", &a, &b, &c);
9
10     if( a>b && a>c)
11         largest = a;
12     else if( b>c && b>c)
13         largest = b;
14     else
15         largest = c;
16
17     printf("Largest number is: %d", largest);
18     return 0;
19 }
```

### Output

Please enter three number: 4 2 8  
Largest number is: 8





# Ladder *if ...else* Statement (Contd...)

## Example 2

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### *if ...else* Statement Syntax (Multiple Statement)

```
1  /* Example for Else If Statement in C Language */
2  #include <stdio.h>
3  int main()
4  {   int Totalmarks;
5      //Imagine you have 6 subjects and Grand total is 600
6      printf("Please Enter your Total Marks\n" );
7      scanf( "%d", &Totalmarks );
8      if (Totalmarks >= 540)
9      {
10         printf("You are eligible for Full Scholarship\n");
11         printf("Congratulations\n");
12     }
13     else if (Totalmarks >= 480)
14     {
15         printf("You are eligible for 50 Percent Scholarship\n"
16             );
17         printf("Congratulations\n");
18     }
19     else if (Totalmarks >= 400)
20     {
21         printf("You are eligible for 10 Percent Scholarship\n"
22             );
23         printf("Congratulations\n");
24     }
25     else
26     {   printf("You are Not eligible for Scholarship\n");
27         printf("We are really Sorry for You\n");
28     }
29     return 0;
30 }
```

### Output

```
Please Enter your Total Marks
564
You are eligible for Full Scholarship
Congratulations
```



# Nested *if ...else* Statement

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### Example 01

```
1  /*Check for Leapyear*/
2
3  #include <stdio.h>
4  int main()
5  {
6      int year;
7      printf("Enter a year: ");
8      scanf("%d", &year);
9      if (year % 4 == 0)
10     {
11         if (year % 100 == 0)
12         {
13             // the year is a leap year if it is divisible by 400.
14             if (year % 400 == 0)
15                 printf("%d is a leap year.", year);
16             else
17                 printf("%d is not a leap year.", year);
18         }
19         else
20             printf("%d is a leap year.", year);
21     }
22     else
23         printf("%d is not a leap year.", year);
24
25     return 0;
26 }
```

### Output

Enter a year: 2020  
2020 is a leap year.



# Example

## Example 1

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### Example 01

```
1  /* Find largest number among three number*/
2
3  #include <stdio.h>
4  int main(void)
5  {
6      int a, b, c;
7      printf("Please enter three number: \t");
8      scanf("%d%d%d", &a, &b, &c);
9      if (a > b)
10     {
11         if (a > c)
12         {
13             printf("\nGreatest number = %d \n",a);
14         }
15         else
16         {
17             printf("\nGreatest number = %d \n",c);
18         }
19     }
20     else if (b > c)
21     {
22         printf("\nGreatest number = %d \n",b);
23     }
24     else
25     {
26         printf("\nGreatest number = %d \n",c);
27     }
28     return 0;
29 }
```

### Output

Please enter three number: 4 2 8

Greatest number = 8



# Example

## Example 2

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### Example 01

```
1  /*Temperature Conversion C to F or F to C.*/
2  #include <stdio.h>
3  int main()
4  {
5      float fh,cl;
6      char ch;
7      printf("\n\n Press c to convert temperature from
8      Fahrenheit to Celsius.");
9      printf("\n\n Press f to convert temperature from Celsius
10     to Fahrenheit.");
11     printf("\n\n Enter your choice (c, f): ");
12     scanf("%c",&ch);
13     if((ch == 'c') || (ch == 'C'))
14     {
15         printf("\n\nEnter temperature in Fahrenheit: ");
16         scanf("%f",&fh);
17         cl= (fh - 32) / 1.8;
18         printf("\n\nTemperature in Celsius: %.2f\n\n",cl);
19     }
20     else if((ch == 'f') || (ch == 'F'))
21     {
22         printf("\n\nEnter temperature in Celsius: ");
23         scanf("%f",&cl);
24         fh= (cl*1.8)+32;
25         printf("\n\nTemperature in Fahrenheit: %.2f\n\n",fh);
26     }
27     else
28     {
29         printf("\n\nInvalid Choice !!!\n\n");
30     }
31     return 0;
32 }
```

### Output

Press c to convert temperature from Fahrenheit to Celsius.  
Press f to convert temperature from Celsius to Fahrenheit.  
Enter your choice (c, f): c  
Enter temperature in Fahrenheit: 98.4  
Temperature in Celsius: 36.89



# Exercise

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### Problem 1

Write a C program to input basic salary of an employee and calculate gross salary according to given conditions.

- Basic Salary  $\leq 10000$  : HRA = 20%, DA = 80%
- Basic Salary is between 10001 to 20000 : HRA = 25%, DA = 90%
- Basic Salary  $\geq 20001$  : HRA = 30%, DA = 95%

### Problem 2

Write a program to check a given character is upper case, lower case, number or other character.



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K. Yashwant, "Let us c," *Array and pointers, 7th edition, BPB publication*, 1999.



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Get in touch via...



+91 9046174189



jaynath4025@gmail.com

*Thank You...*