# MA2252 Introduction to Computing

## Lecture 7: Branching Statements

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# Learning outcomes

At the end of lecture, students will be able to understand and create

- If-Statements
- Switch statements

# Branching Statements

Branching statements are used in programming to execute a section of code under specific conditions.

**Examples:**

1. If-Statements
2. Switch Statements

# If-Statements

If statements can be constructed in different ways and they always end with end keyword.

1. Using if keyword

   **Construction:**

   ```
   if logical expression
         code block
   end
   ```

# If-Statements (contd.)

**Example:**

```
function [t] = total_marks(x,y)
if x<40||y<40
   disp('FAIL')
end
t=x+y;
end
```

# If-Statements (contd.)

2. Using if and else keywords

**Construction:**

```
if logical expression
      code block 1
else
      code block 2
end
```

# If-Statements (contd.)

**Example:**

```
function [t] = total_marks(x,y)
if x<40||y<40
   disp('FAIL')
else
   disp('PASS')
end
t=x+y;
end
```

# If-Statements (contd.)

Demo

# If-Statements (contd.)

3. Using if, elseif and else keywords

**Construction:**

```
if logical expression P
      code block 1
elseif logical expression Q
      code block 2
elseif logical expression R
      code block 3
else
      code block 4
end
```

# If-Statements (contd.)

**Example**

```
function [t] = total_marks(x,y)
if x<0||y<0
   disp('marks cannot be negative')
elseif x>100||y>100
   disp('marks cannot exceed 100')
elseif x<40||y<40
   disp('FAIL')
else
   disp('PASS')
end
t=x+y;
end
```

# If-Statements (contd.)

Demo

# If-Statements (contd.)

**Nested If-Statement**

If-statement nested/contained within another if-statement.

# If-Statements (contd.)

**Example:**

```
function [t] = total_marks(x,y)
if x<0||y<0
   disp('marks cannot be negative')
   t=sprintf('cannot calculate total marks');
elseif x>100||y>100
   disp('marks cannot exceed 100')
   t=sprintf('cannot calculate total marks');
```

# If-Statements (contd.)

```
else
t=x+y;
   if x<40||y<40
      disp('FAIL')
   else
      disp('PASS')
   end
end
end
```

# If-Statements (contd.)

Demo

# Activity

```
function [weight] = myweight(x)
if weight>70
   disp('Eat healthy')
elseif weight>80
   disp('Exercise more')
elseif weight>100
   disp('Call the doctor')
else
   disp('Relax!')
end
```

My weight is 110 kg. What suggestion this code will give? To answer, please go to mentimeter link in the chat.

# Switch Statements

Switch statements are used to check if an expression is equal to one of possible values. Each value is called a case.

# Switch Statements (contd.)

**Construction:**

```
switch expression
   case value 1
      code block 1
   case value 2
      code block 2
   case value 3
      code block 3
   otherwise
      code block 4
end
```

# Switch Statements (contd.)

**Example:**

```
function grade = mygrade_switch(x)
%this function calculates grade based on marks from 0 to 10 using switch
switch x
   case 10
      grade='A+';    %assign A+ if marks=10
   case 9
      grade='A';
   case{7,8}
      grade='B';
   otherwise
      grade='C'
end
end
```

# Switch Statements (contd.)

Demo

# If vs Switch

1. If-statements are useful when you deal with logical conditions in your code.
2. Switch becomes handy when you deal with one expression taking multiple possible values.
3. Switch statements can also be written using if-statements but vice-versa is not true in general.

# End of Lecture 7

Please provide your feedback here