Additional Control Structures

- The *switch* statement

  - A multibranch selection control structure

  - Similar to nested *if* statements

- Syntax template

```
switch (Expression)
{
[SwitchLabel...Statement] .
 .
 .
}
```

- The *Expression* must be of type: char, short, int, long (not float, double, etc. !!!)

- The *SwitchLabel* must be a **constant** of type char, short, int, long (not float, double, etc. !!) or the keyword *default*

- An example

```
switch (grade)
{
 case 'A': cout << "Very good work !!" << endl;
 case 'B': cout << "Good work !!" << endl;
 case 'C': cout << "Average work !!" << endl;
 case 'D': cout << "Poor work !!" << endl;
 case 'F': cout << "Very poor work !!" << endl;
 default: cout << grade << " is not a legal letter" << endl;
}
cout << "End of grade assignment" << endl;
```

- Each *SwitchLabel* cannot appear more than once

- The *default* label is optional but no more than one *default* is allowed

- The flow of control continues from the selected case SwitchLabel until the end of the *switch* statement

- A single statement may be preceded by more than one case label

- Each case can include more than one statements (no braces are needed !!)

```
switch (grade)
{
 case 'A':
 case 'B': cout << "Good work !!" << endl;
 case 'C':
 case 'D': cout << "Poor work !!" << endl;
        ++numberInTrouble;
 default: cout << grade << " is not a legal letter" << endl;
}
cout << "End of grade assignment" << endl;
```

- To redirect the flow of control outside the *switch* element, a *break* statement must be used

```
switch (grade)
{
 case 'A': cout << "Very good work !!" << endl;
        break;
 case 'B': cout << "Good work !!" << endl;
        break;
 case 'C': cout << "Average work !!" << endl;
        break;
 case 'D': cout << "Poor work !!" << endl;
        break;
 case 'F': cout << "Very poor work !!" << endl;
        break;
 default: cout << grade << " is not a legal letter" << endl;
}
cout << "End of grade assignment" << endl;
```

- *switch* vs *if* statements

```
if(grade == 'A')
  cout << "Very good work !!" << endl;
else if(grade == 'B')
  cout << "Good work !!" << endl;
else if(grade == 'C')
  cout << "Average work !!" << endl;
else if(grade == 'D')
  cout << "Poor work !!" << endl;
else if(grade == 'F')
  cout << "Very poor work !!" << endl;
else cout << grade << " is not a legal letter" << endl;
cout << "End of grade assignment" << endl;
```