*Programming*

# Fundamentals

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*SECTION 1:*

# SWITCH Construct

# What is Switch Construct?

- A **decision-making structure** in programming.
- Allows a **variable/expression** to be compared with **multiple fixed constant values.**
- In few cases, it provides a cleaner and more efficient alternative to **long if–else if** chains.

# SYNTAX

```
switch(expression) {
  case constant1:
    // code
    break;
  case constant2:
    // code
    break;
  ...
  default:
    // code
}
```

**Rules:**

- **expression must be an integer,  or char type.**
- **case labels must be constant values (not variables or expressions).**
- **break exits the switch block.**
- **default is executed if no match is found.**

# If-Else-If vs Switch

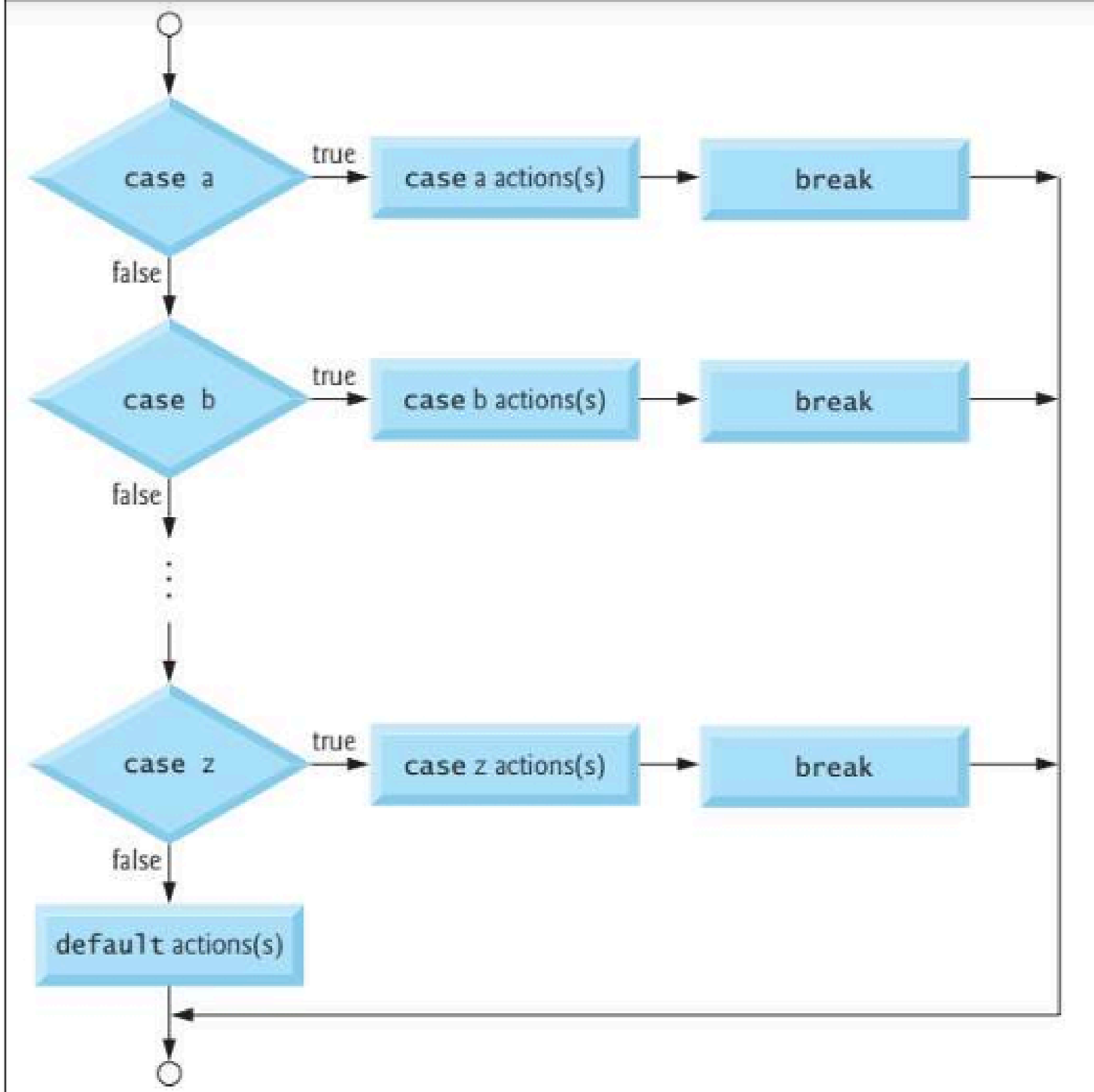
```
int day = 3;

if(day == 1) cout << "Monday";
else if(day == 2) cout << "Tuesday";
else if(day == 3) cout <<
"Wednesday";
else cout << "Invalid";
```

```
int day = 3;

switch(day) {
  case 1: cout << "Monday"; break;
  case 2: cout << "Tuesday"; break;
  case 3: cout << "Wednesday";
break;
  default: cout << "Invalid";
}
```

# FLOWCHART


case a
true
case a actions(s)
break
false
case b
true
case b actions(s)
break
false
case z
true
case z actions(s)
break
false
default actions(s)

*SECTION 2:*

# BREAK Statement

# Break Statement

- break stops execution and exits the switch.
- Without break, program falls through to the next case.

**WITH BREAK**

```
int x = 2;
switch(x) {
  case 1: cout << "One"; break;
  case 2: cout << "Two"; break;
  case 3: cout << "Three"; break;
}
```

**OUTPUT: Two**

**WITHOUT BREAK**

```
int x = 2;
switch(x) {
  case 1: cout << "One";
  case 2: cout << "Two";
  case 3: cout << "Three";
}
```

**OUTPUT: TwoThree**

# Q: Simple ATM Menu

**Write a C program to simulate a simple ATM menu using a switch statement.**

- **The program should start with a balance of 1000.**
- **Display the following menu to the user:**

**1. Withdraw**
**2. Deposit**
**3. Check Balance**
**4. Exit**

- **If the user chooses 1 (Withdraw), ask for the withdrawal amount, deduct it from balance, and display the remaining balance.**
- **If the user chooses 2 (Deposit), ask for the deposit amount, add it to balance, and display the new balance.**
- **If the user chooses 3 (Check Balance), simply display the current balance.**
- **If the user chooses 4 (Exit), display "Exiting..." and end the program.**
- **If the user enters an invalid option, display "Invalid choice".**

# Q: Calculator

**Write a C program to implement a simple calculator using a switch statement.**

- **The program should take two integers and a mathematical operator (+, -, *, /, %) as input.**
- **Based on the operator entered, the program should perform the corresponding calculation and display the result.**
- **Handle the case where the user tries to divide by zero or use modulus with zero.**
- **If the operator entered is not valid, display "Invalid operator".**

*SECTION 3:*

# Nested Switch

# Q: Day and Activity Planner

**Write a C program using nested switch:**

- **Ask the user to enter a day of the week (1 = Monday, ..., 7 = Sunday).**
- **For weekdays (1–5):**
  - **Ask if the time is Morning (M) or Evening (E).**
  - **If Morning → Print "Go to Class"**
  - **If Evening → Print "Do Homework"**
- **For weekends (6–7):**
  - **Ask if the time is Morning (M) or Evening (E).**
  - **If Morning → Print "Play Sports"**
  - **If Evening → Print "Watch Movie"**
- **If day is invalid → Print error.**

# Q: College Program and Courses

**Write a C program using nested switch:**

- **Ask the user to enter program type:**
  - **1 = Computer Science**
  - **2 = Electrical Engineering**
- **Inside each program, ask for year:**
  - **1 = First Year**
  - **2 = Second Year**
- **Display courses accordingly.**

# Thank You