Homework 3
Selection Statements in C++

CSI-140 Introduction to Programming

Instructor: Dr. Vikas Thammanna Gowda Semester: Fall 2025

Points: 100 **Assigned Date:** 10/07/2025 **Due Date:** 10/14/2025 (11:59 PM)

Name: _____ **Section:** _____

Failure to follow the instructions and submission guidelines may result in a reduction of up to 100% of the points.

Instructions

- **Handwritten:**
  - Write your name and course section.
  - Use the handout provided by the instructor to complete the HW. (There will be a few additional copies in the file folder outside my office door – West Hall 200.)
  - Print a blank template from Canvas and write on it by hand.
  - Use the soft copy from Canvas and write directly on a tablet. Submit a single PDF file.
- **Use of word processor:**
  - Add your name and course section.
  - The homework should be answered in chronological order.
  - Each question must be added in **bold** before answering.
  - Submission must be a single PDF file.
- **Why PDF?** PDF files are universally compatible, meaning they can be opened and viewed on virtually any device with a PDF reader. This makes them ideal for sharing documents with a wide range of recipients, regardless of their software or hardware.
- **Individual Work:** This is an individual homework assignment. While you are encouraged to discuss the problem and possible approaches with your classmates, all work must be completed independently.
- **Plagiarism Policy:** Any form of plagiarism – including copying code, solutions, or text from another student, use of AI to generate report/answers – will be considered academic dishonesty and will be reported according to college policy.
- **Late submission policy:** 50% penalty for late submissions within 1 week; no credit after 1 week unless prior arrangements made.

Submission Guidelines:

- Drop off your completed assignment in the file folder outside my office door (West Hall 200) or turn it in during lecture sessions.
- **All other submissions must be a single, PDF file that is clear and easy to read.**

Rubric

Criteria	Points	Grade
Name and Section are present	10	
Section A: Condition is valid (2 Points each)	10	
Section B: Part 1: Valid code block	10	
Section B: Part 1: No logical error	15	
Section B: Part 2: Valid code block	10	
Section B: Part 2: No logical error	20	
Section B: Part 3: No logical error	25	

Section A: Constructing Conditions (2 points Each)

Write the boolean condition (expression) for the following scenarios:

1. A customer qualifies for express shipping if their order value is above $75 AND they are a member. Given variables `orderValue` and `isMember` (boolean).

2. A parking ticket is issued if a car is parked for more than 2 hours OR parked in a no-parking zone. Given variables `hoursParked` and `isNoParkingZone` (boolean).

3. A number is a perfect square candidate if it is positive AND not equal to 1. Given variable `num`.

4. A student receives a scholarship if their GPA is 3.5 or above AND they are either an athlete OR involved in community service. Given variables `gpa`, `isAthlete` (boolean), and `involvedInService` (boolean).

5. A character is a valid hexadecimal digit if it is between '0' and '9' OR between 'A' and 'F' OR between 'a' and 'f'. Given variable `ch`.

Section B: Student Grade Management System

Follow these steps to master selection statements (if-else and switch) in C++. You'll work with the provided `grade_management.cpp` starter code and complete each part by adding the required selection logic.

Part 1: Grade Classification

Complete the if-else ladder to classify a student's grade based on their score:

- 90-100: Grade A (Excellent)
- 80-89: Grade B (Good)
- 70-79: Grade C (Average)
- 60-69: Grade D (Below Average)
- Below 60: Grade F (Failing)

Give the code block of the if-else ladder.(10 points)

Test with the following scores and record the output:(5 points)

Test Score	**Expected Grade**	**Your Output**
95	A (Excellent)	
82	B (Good)	
75	C (Average)	
65	D (Below Average)	
45	F (Failing)	

Test the code with your own inputs and record the output: (10 points)

Test Score	**Your Output**

Part 2: Scholarship Eligibility

Implement nested if-else statements to determine scholarship eligibility based on:

- GPA must be >= 3.5
- If GPA requirement is met, check attendance:
  - >= 90%: Full scholarship
  - >= 80%: Partial scholarship
  - < 80%: No scholarship (attendance too low)
- If GPA < 3.5: Not eligible

Give the code block of the nested if-else.(10 points)

Test with these combinations and record the output:(8 points)

GPA	Attendance %	Expected Result	Your Output
3.8	95	Full scholarship	
3.6	85	Partial scholarship	
3.7	75	No scholarship (low attendance)	
3.2	92	Not eligible (low GPA)	

Test the code with your own inputs and record the output: (12 points)

GPA	Attendance %	Your Output

Part 3: Menu-Driven Calculator

Create a calculator using switch statement with the following menu:

```
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Modulus
```

Include error handling for division by zero and invalid menu choices.
Test these operations and record the output: (10 points)

Choice	Num1	Num2	Expected	Your Output
1	10	5	15	
2	20	8	12	
3	7	6	42	
4	15	3	5	
4	10	0	Error message	
5	17	5	2	
7	-	-	Invalid choice	

Test these operations with your own inputs for Num1 and Num2 and record the output: (15 points)

Choice	Num1	Num2	Your Output
1			
1			
3			
4			
4			
5			
11			