ECEN 489: Assignment 4

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True or False

1. **0.5 pt** – A same symbol can denote both a unary operator and a binary operator.

   True.

2. **0.5 pt** – A compile-time warning is always given when an overflow exception occurs.

   False.

Short Questions

1. **1 pt** – What is an overloaded operator?

   An overloaded operator is a user-defined operator for existing or user-defined types. It permits assigning type-specific meaning to the standard C++ operators. Care should be taken to not violate the semantics of the operators, though there is no language enforcement.

2. **1 pt** – Define a compound expression.

   A compound expression is an expression involving multiple operators and operands.

3. **1 pt** – Determine the results of the following expressions and test your answers by compiling the expressions.

   (a) `-40 * 4 + 23 / 7`
   = -157

   (b) `-40 + 4 * 23 / 7`
   = -27

   (c) `40 / 4 * 23 % 7`
   = 6

   (d) `-40 / 4 * 23 % 7`
   = -6

4. **1 pt** – What is the meaning of short-circuit evaluation in the context of logical operators?

   The compiler emits code that does not necessarily evaluate all subexpressions of a logical expression. The terms at a given lexical level of the expression are evaluated from left to right, as written. As soon as the truth or falsity of the subexpression can be determined, evaluation stops. This allows subexpressions that have side-effects, such as the increment and decrement operators, to be conditionally invoked, which can be convenient in some situations.

5. **1 pt** – Explain the structure of the conditional operator.

   The conditional operator evaluates its condition (the expression to the left of the question mark). If the condition is true, the conditional operator takes the value of the expression between the question mark and the colon. If the condition is false, the conditional operator takes the value of the expression to the right of the colon.

6. **1 pt** – Consider the following variables of the given type:
   (a) long
   (b) unsigned long
   (c) signed long
   (d) double
   (e) double
   (f) unsigned int
   (g) int
   (h) unsigned long

Programming Challenge

```
./summary-stats < pi_digits
Sample Mean:        4.71429
Unbiased Sample Variance:       8.59066
Sample Median: 4
Sample Mode: 9
```