Final Exam Exercises

CS 1428
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Jill Seaman

MC: Expressions

What is the value of the variable x after executing the following statement?

```
float x = 13/4;
```

(a) 3.25
(b) 3.3
(c) 3.0
(d) 1.75

MC: Function Calls

You have the following function prototype in your program:

```
void factorial(int);
```

given: `int x; int factor;` in main, indicate if the following function calls in main are valid or not.

1. `factorial(17);`   (a) valid   (b) not valid
2. `factorial(x);`   (a) valid   (b) not valid
3. `factorial(factor-17);` (a) valid   (b) not valid
4. `x = factorial(100);`   (a) valid   (b) not valid

T/F: Scope

If a variable named x is defined in function main:
1. You cannot have a variable named x in another function.   (a) true (b) false
2. You cannot declare another variable named x inside main (unless it is inside a nested block).   (a) true (b) false
3. You cannot declare a parameter named x in another function.   (a) true (b) false
4. You cannot declare a variable named x that is global to all functions.   (a) true (b) false

Values of Expressions

What is the value of the following expressions?

```
int i, j = 6, k = 2;   //given this

1. 28 / 4 – k
2. j + 12 * k – 8
3. j + 17 % 3 – k
4. k + 22 * (9 – 7)
5. 12 / (10 – j)
6. (19 – 3) * (k + k) / 4
7. i = 38.9;        //what is stored in i?

8.  k > 0 && false    (a) true (b) false (c) unknown (d) error
9.  k > 0 || k < 10   (a) true (b) false (c) unknown (d) error
10. k < 0 || k > 10   (a) true (b) false (c) unknown (d) error
```

Tracing #1

What is output by the following program?

```
int fun(int &x, int y) {
   x = 3;
   y = 4;
   return 5;
   x++;
}
int main() {
   int a = 1, b = 2, c = 3;
   c = fun(a, b);
   cout << a << " " << b << " " << c;
}
```

(a) 1 2 3   (b) 3 4 3   (c) 3 4 5   (d) 3 4 6   (e) 3 2 5

Tracing #2

What is output by the following program?

```
const int SIZE = 5;
void sky(int a[ ]) {
   a[1] = 25;
   a[SIZE-1] = 66;
}
int main() {
   int nums[SIZE] = {1,2,3,4,5};
   sky(nums);
   for (int i=0; i<SIZE; i++)
     cout << nums[i] << " ";
   cout << endl;
}
```

(a) 1 2 3 4 5

(b) 25 2 3 66 5

(c) 1 25 3 66 5

(d) 1 25 3 4 66

(e) 25 2 3 4 66

Find the errors

This function that should calculate and return the average of three integers. Fix the errors in the function definition.

```
double average(int value1, int value2)
{
   average = value1 + value2 + value3 / 3;
}
```

Programming: Chapter 2

Convert the following pseudocode to C++ code. Be sure to define the appropriate variables:

Store 172.5 in the *force* variable.
Store 27.5 in the *area* variable.
Divide *area* by *force* and store the result in the *pressure* variable.
Display the contents of the *pressure* variable.

Programming: Chapter 3

Write a a program that asks the user to enter a golfer's score for three games of golf, and then displays the average of the three scores.

Programming: Chapter 4

Using the following chart, write a nested `if/else` statement that assigns .10, .15, or .20 to `commission`, depending on the value in `sales`. Try not to use any redundant boolean expressions in your if/else statement.

Sales	Commission Rate
Under $10,000	10%
$10,000 to $15,000	15%
Over $15,000	20%

Programming: Chapter 5

A. Write a for loop that displays the following set of numbers:
   0, 10, 20, 30, 40, 50 . . . 1000

B. Write a code segment that asks the user to "enter a series of positive numbers, then enter a -1 when finished." Your code should compute and output the sum of the numbers (do not include -1 in the sum).

Programming: Chapter 6

A. The following statement calls a function named `half`. The `half` function returns a value that is half that of the argument. Write the function.

```
result = half(number);
```

B. Write a function named `getNumber` that uses a reference parameter variable to accept an integer argument. The function should prompt the user to enter a number in the range of 1 through 100. The input should be validated and stored in the parameter variable.

Programming: Chapter 7

A. The arrays `numberArray1` and `numberArray2` have 100 elements. Write code that copies the values in `numberArray1` to `numberArray2`.

B. Write a program that lets the user enter ten values into an array. The program should then display the largest and smallest values stored in the array.

C. In a program, write a function that accepts three arguments: an array, the size of the array, and a number n. Assume the array contains integers. The function should display all of the numbers in the array that are greater than the number n.

Programming: Chapter 11

The structure Car is declared as follows:

```
struct Car {
  string carMake;
  string carModel;
  int yearModel;
  double cost;
};
```

A. Define an array of 35 of the Car structure variables. Initialize the first three elements with the following data:

Make	Model	Year	Cost
Ford	Taurus	1997	$21,000
Honda	Accord	1992	$11,000
Lamborghini	Countach	1997	$200,000

B. Write a loop that will step through the array you defined in Question A, displaying the contents of each element.