

Final Exam Exercises

CS 1428
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Jill Seaman

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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

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MC: Function Calls #1

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

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MC: Function Calls #2

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

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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

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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

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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

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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

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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;
}
```

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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.

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Programming: Chapter 3

Write 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.

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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%

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Programming: Chapter 5

- A. Write a while loop that lets the user enter a number. The number should be multiplied by 10, and the result stored in the variable `product`. The loop should iterate as long as `product` contains a value less than 100.
- B. Write a for loop that displays the following set of numbers: 0, 10, 20, 30, 40, 50 . . . 1000

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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.

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Programming: Chapter 7

- A. The arrays `numberArray1` and `numberArray2` have 100 elements. Write code that copies the values in `numberArray1` to `numberArray2`.
- B. What is the error in the following code?

```
int table[10];
for (int x = 0; x < 20; x++)
{
    cout << "Enter the next value: ";
    cin >> table[x];
}
```

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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.

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Programming Problem

These are good Programming Challenge problems for extra practice:

- Chapter 2.4: Restaurant Bill
- Chapter 3.6 Ingredient Adjuster
- Chapter 4.9 Change for a Dollar Game
- Chapter 5.6 Distance Traveled
- Chapter 6.5 Falling Distance
- Chapter 7.5 Driver's License Exam
- Chapter 11.4 Weather Statistics