

## Final Exam Exercises

CS 1428  
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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);
```

Which of the following are legal? (assume you have `x` and `factor` declared as `int` in the caller function)

Circle all correct answers:

- (a) `factorial(x);`
- (b) `factorial(factor-17);`
- (c) `factorial(17);`
- (d) `x = factorial(100);`

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## MC: Function Calls #2

You have the following function prototype in your program:

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

Which of the following are legal? (assume you have `x` and `factor` declared as `int` in the caller function)

Circle all correct answers:

- (a) `factorial(x);`
- (b) `factorial(factor-17);`
- (c) `factorial(17);`
- (d) `x = factorial(100);`

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## T/F: Scope

If a variable named x is defined in function main:

- (a) T/F: you cannot have a variable named x in another function.
- (b) T/F: you cannot declare another variable named x inside main (unless it is inside a nested block).
- (c) T/F: you cannot declare a parameter named x in another function.
- (d) T/F: you cannot declare a variable named x that is global to all functions.

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## Values of Expressions

What is the value of the following expressions?

```
int i, j = 6, k = 2; //given this
28 / 4 - k
j + 12 * k - 8
j + 17 % 3 - k
k + 22 * (9 - 7)
12 / (10 - j)
(19 - 3) * (k + k) / 4
i = 38.9; //what is stored in i?
k > 0 && false
k > 0 || k < 10
k < 0 || k > 10
```

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## Tracing #1

What is output when the following code segment is executed?

```
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 << endl;
}
```

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## Tracing #2

What is output when the following code segment is executed?

```
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] << endl;
}
```

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## Find the errors

What are the errors in the following function that should calculate and return the average of three integers?

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

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## Short Programming Problem

Write a function named `bigNums` that has two parameters: an array of integers and the size of the array. The function should return a count of the number of elements in the array greater than 1000.

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## Long Programming Problem

Write a program that stores the following data about a soccer player in a structure:

- Player's Last Name
- Player's Number
- Points Scored by Player

The program should keep an array of 12 of these structures, one for each player on a team. When the program runs it should ask the user to enter the data for each player. It should then show a table that lists each player's number, name, and points scored. The program should also calculate and display the total points earned by the team. The number and name of the player who has earned the most points should also be displayed.

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