

Name _____

CSE Login _____

Instructions

Follow instructions *carefully*, failure to do so may result in points being deducted. Clearly label each problem and submit the answers *in order*. Staple this cover page to the front of your assignment for easier grading. You may discuss problems with your classmates, but all work must be your own. The CSE academic dishonesty policy is in effect (see http://www.cse.unl.edu/undergrads/academic_integrity.php).

For each of the programs, place your source code into files named `homework01program01.c`, `homework01program02.c`, `homework01program03.c` and `homework01program04.c` respectively and turn them in using the webhandin available on the course webpage. You do not need to printout your source code for the programs.

Question	Points	Score
1	10	
2	10	
3	10	
4	15	
5	10	
6	15	
7	15	
8	15	
Total:	100	

1. 10 points For each variable below, indicate if it is syntactically correct. If it is not, indicate *why* it is not a valid identifier.

- (a) `income`
- (b) `two fold`
- (c) `100times`
- (d) `c3po`
- (e) `int`
- (f) `income#1`
- (g) `Tom's`
- (h) `item`

2. 10 points For each of the following code snippets, what value is assigned to `x` when `y` has the value 15.0?

- (a)

```
1 x = 25.0;
2 if (y != (x - 10.0))
3     x = x - 10.0;
4 else
5     x = x / 2.0;
```

- (b)

```
1 if (y < 15.0)
2     if (y >= 0.0)
3         x = 5 * y;
4     else
5         x = 2 * y;
6 else
7     x = 3 * y;
```

- (c)

```
1 if (y < 15.0 && y >= 0.0)
2     x = 5 * y;
3 else
4     x = 2 * y;
```

3. 10 points There are four errors in the program below. Identify and fix all four problems

```
1  /* This program reads an integer
2  * and outputs its square root
3  #include<stdio.h>
4  #include<math.h>
5
6  int main(void)
7  {
8      double a;
9      printf("Please enter a number: ");
10     scanf("%f", &a);
11     b = sqrt(a);
12     printf("The square root of %f is %f\n",a,b);
13     return 0
14 }
```

4. 15 points Indicate if each of the following are valid C declaration/assignment statements or not (answer *valid* or *invalid*).

- (a) `integer x;`
- (b) `int 1stInteger;`
- (c) `int xyz;`
- (d) `int n = 120`
- (e) `double radius = 1.00;`
- (f) `double a, b = 1.0, c;`
- (g) `double a = b = c = 1.0;`
- (h) `double x = (double) 'a';`
- (i) `char 'a';`
- (j) `char myChar = "a";`
- (k) `char myString = "abc";`
- (l) `string message = "Hello World!";`
- (m) `double f(x) = 2*x;`
- (n) `int my_number = 12;`
- (o) `int my number = 12;`

5. 10 points **Program 1** Write a program to convert a temperature in degrees Fahrenheit (f) to degrees Celsius (c), using the equation

$$c = \frac{5}{9}(f - 32)$$

Read from the standard input by prompting the user for input.

6. 15 points **Program 2** Write a program that calculates mileage reimbursement for a salesperson at a rate of \$0.35 per mile. Your program should interact with the user in this manner.

```

1 MILEAGE REIMBURSEMENT CALCULATOR
2 Enter beginning odometer reading--> 13505.2
3 Enter ending odometer reading--> 13810.6
4 You traveled 305.4 miles. At $.35 per mile,
5 your reimbursement is $106.89.
```

Be sure that you format your output in a sensible manner and echo an error message for invalid odometer readings.

7. 15 points **Program 3** Write a program that prompts the user for an x and a y coordinate in the Cartesian plane and prints out a message indicating if the point (x, y) lies on an axis (x or y axis, or both) or what quadrant it lies in (see Figure 1).

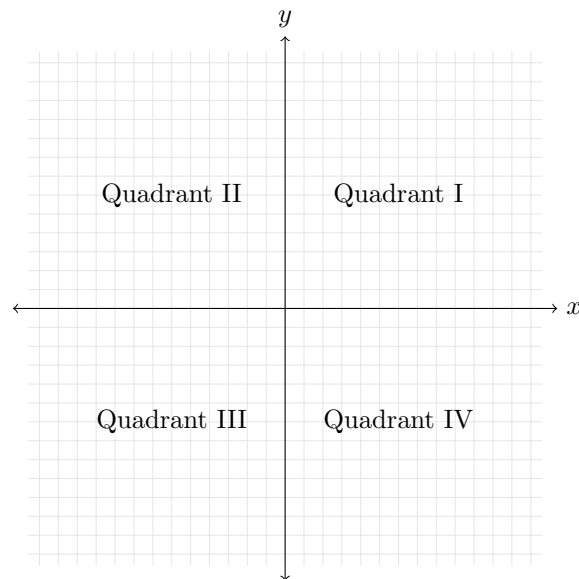


Figure 1: Quadrants of the Cartesian Plane

8. 15 points **Program 4** Write a program that calculates the speed of sound (v , feet-per-second) in the air of a given temperature T (in Fahrenheit). Use the formula,

$$v = 1086\sqrt{\frac{5T + 297}{247}}$$

Be sure your program does not lose the fractional part of the quotient in the formula shown and format the output to three decimal places.