Palomar College
Computer Science &
Information Technology
CSCI 112 Programming Fundamentals I
Chapter 4 – HW 6

Write the if logic in C for each of the following problems.

1. Design an If statement that assigns 20 to the variable y and assigns 40 to the variable z if the variable z is greater than 100.

```
if (z > 100)
{   z = 40
    y = 20  }
else {
    y = 20
    }
```

2. Given the declarations:

```
int age;
char gender  //'m', 'f', 'x'
int senior_citizen;  //0 if not, 1 if true
```

   a. Create an if statement that sets the value of senior_citizen to true if the age is greater than or equal to 65.
   b. Create an if statement to print a message if they are a senior citizen and male.
   c. Create an if statement to print a message if they are not a senior citizen and female and if their age is divisible by 2. Print "It's a great even year for you!!"

a.
```
if (senior_citizen >= 65)
    senior = 1;
else
    senior = 0;
```

b.
```
if (senior == 1 && char == 'm')
    printf ("Male Senior")
```

c.
```
if (senior == 0 && char == 'f' && age%2 == 0)
    Printf ("Its a great even year for you!");
else
printf("try again");
```

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3. Evaluate each of the following expressions if a is 6, b is 9, c is 12, and flag is 1. Which parts of these expressions are not evaluated due to short-circuit evaluation?
   a. c == a + b || !flag
   b. a != 7 && flag || c>= 6
   c. !(b <= 12) && a % 2 == 0
   d. !(a > 5) || c<a + b

4. Write an expression to test for each of the following relationships.
   a. Age is from 18 to 21 inclusive.

      min <= 18 && 21 <= max

   b. Water is less than 1.5 and also greater than 0.1. water <= 1.5 & water > 0.1

      water < 1.5 and water > 0.1

   c. Year is divisible by 4. (Hint: use %).

      year % 4 == 0

   d. Speed is not greater than 55.

      speed <= 55

   e. Y is greater than x and less than z.

      Y > X and Y < Z

   f. W is either equal to 6 or not greater than 3.

      W == 6 || W <= 3

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4. What value is assigned to x when y is 10.0?

a.
```
x = 25.0;
if (y != (x – 10.0)
   x = x – 10.0;
else
   x = x / 2.0;
```
15

b.
```
if (y < 15.0)
    if (y >= 0.0)
       x = 5 * y;
    else
       x = 2 * y;
else
    x = 3 * y;
```
50

c.
```
if (y < 15.0 && y >= 0.0)
        x = 5 * y;
else
        x = 2 * y;
```
50

5. Design nested decision structures that perform the following: if amount1 is greater than 10 and amount 2 is less than 100, display the greater of amount1 and amount2. Hint: the first if does not check the values of amount1 and amount 2.

```
if (amount1 > amount2)
    if (amount1 >10 and amount2 < 100)
        printf(amount1);
else
    if (amount1 >10 and amount2 <100)
        print(amount2);
```

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6. Write C statements to carry out the following steps.
   a. If item is nonzero, then multiply product by item and save the result in product; otherwise, skip the multiplication. In either case, print the value of product.

```
if ( item != 0)
    item * product = x
    product = x
    print(x)
else
    print(product)
```

   b. Store the absolute difference of X and y in y, where the absolute difference is (x-y) or (y – x), whichever is positive. Do not use the abs or fabs function in your solution.

```
if ( x > y )
    store = x - y;
else
    store = y - x;
```

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7. Rewrite the following if else if statement as a select case statement.

```
If selection == 1
        Print  "you selected 1"
Else if selection == 2
        Print "you selected 2"
Else if selection == 3
        Print "you selected 3"

Else if selection == 4
        Print "you selected 4"
Else
        "Print "Trouble counting"
```

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8. Design an if else statement that displays "Speed is normal" if the speed variable is within the range of 24 to 56. If the speed holds a value outside this range, display "speed is abnormal."

```
if (speed >= 24 && speed <= 56)
    printf(speed is normal)
else
    printf(speed is abnormal)
```

9. Design an if else statement that determines whether the points variable is outside the range of 9 to 51. If the variable holds a value outside this range it should display "Invalid points." Otherwise, it should display "Valid points."

```
if (points <= 9 || points >= 51)
    print (invalid points)
else
    print (valid points)
```

10. Design a case structure that tests the month variable and does the following:
    - If the month variable is set to 1, it displays "January has 31 days."
    - If the month variable is set to 2, it displays "February has 28 days."
    - If the month variable is set to 3, it displays "March has 31 days."
    - If the month variable is set to anything else it displays "invalid selection"