Lab04 Report

Lab04

Section: 4

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Question 1:
Problem: Find compiler errors in the given programs and fix them.
Analysis: problem allows you to become familiar with reading compiler errors.
Design:
Attempted to compile the code and fixed each error in order 1 by one recompiling every time.
Testing:
Recompiled code after each error was fixed to see if the program worked.
Comments:
No comments.
ScreenShots and source code:

```
/*----------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                          -
-       Name:
                                                -
-       Section:
                                        -
-       NetID:
                                                -
-       Date:
                                                -
----------------------------------------------------------------------*/

/*----------------------------------------------------------------------
-                                                                       Includes
                                                -
----------------------------------------------------------------------*/
#include <stdio.h>

/*----------------------------------------------------------------------
-                          Notes                          -
----------------------------------------------------------------------*/
// Compile with gcc lab04-1_1.c -o lab04-1_1
// Run with ./lab04-1_1
/* This program outputs if a integer will divide into another integer with no remainder. */

/*----------------------------------------------------------------------
-                                                                       Implementation
                                        -
----------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   int i, j;

   //printf("Enter an integer: ")
          printf("Enter an integer: ");
   scanf("%d", &i);

   //printf("Enter another integer: );
          printf("Enter another integer: ");
   //scanf("%d", &j)
          scanf("%d", &j);
```

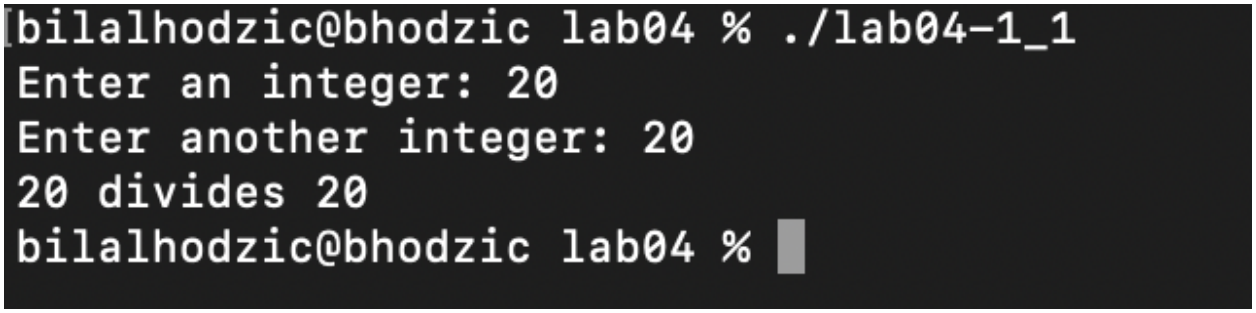
```
    if (j % i == 0)
    {
        printf("%d divides %d\n", i, j);

    //} else
            } else{

        printf("%d does not divide %d\n", i, j);
        printf("%d %% %d is %d\n", j, i, (j % i));
    }

    return 0;

}
```




```
/*-----------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                -
-       Name:
                                                -
-       Section:
                                        -
-       NetID:
                                            -
-       Date:
                                                -
-----------------------------------------------------------------------*/

/*-----------------------------------------------------------------------
-                                                                  Includes
                                        -
-----------------------------------------------------------------------*/
#include <stdio.h>

/*-----------------------------------------------------------------------
-                          Prototypes                          -
-----------------------------------------------------------------------*/
//void force(int mass, int acceleration);
void force(double mass, double acceleration);
```

```
/*-------------------------------------------------------------------------
-                                Notes                                    -
-------------------------------------------------------------------------*/
// Compile with gcc lab04-1_2.c -o lab04-1_2
// Run with ./lab04-1_2
{
    double mass;
            //Added next line
            double acceleration;
    printf("Enter an acceleration in m/s^2: ");
    scanf("%lf", &acceleration);

    printf("Enter the mass of the object in kg: ");
    scanf("%lf", &mass);

    printf("\nYou entered %lf m/s^2.\n", acceleration);
    printf("You entered %lf kg.\n\n", mass);

    force(mass, acceleration);

    return 0;
}

/**
 * Given mass and acceleration, calculates the force exerted.
 *
 * @param mass - The given mass of an object in kilograms.
 * @param acceleration - The acceleration of an object in m/s^2.
 */
void force(double mass, double acceleration)
{
    printf("The force is approximately %.2lf Newtons.\n", mass * acceleration);
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-1_2
Enter an acceleration in m/s^2: 2
Enter the mass of the object in kg: 20

You entered 2.000000 m/s^2.
You entered 20.000000 kg.

The force is approximately 40.00 Newtons.
bilalhodzic@bhodzic lab04 %
```

```
/*-------------------------------------------------------------------------
-                        SE 185: Lab 04 - Debugging Code                  -
-          Name:
                                                                         -
```

```
-           Section:
                                                -
-           NetID:
                                                  -
-           Date:
                                                      -
----------------------------------------------------------------------------*/

/*----------------------------------------------------------------------------
-                                                                   Includes
                                                -
----------------------------------------------------------------------------*/
#include <time.h>
//Added next line
#include <stdio.h>
//Added next line
#include <stdlib.h>
/*----------------------------------------------------------------------------
-                                Prototypes                                  -
----------------------------------------------------------------------------*/
void hoo();
//Added Next line
void print_face(int selection);

/*----------------------------------------------------------------------------
-                                   Notes                                    -
----------------------------------------------------------------------------*/
/* This is a simple program that takes a user inputs
 * and prints out a message based on that input */
// Compile with gcc lab04-1_3.c -o lab04-1_3
// Run with ./lab04-1_3

/*----------------------------------------------------------------------------
-                                                                Implementation
                                                -
----------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
    srand(time(NULL));

    int selection = 0;

    printf("Enter 1 for happy, 2 for sad, 3 for neutral, any other integer for random: ");
    scanf("%d", &selection);

    if (selection < 1 || selection > 3)
    {
        selection = rand() % 4;
    }

    print_face(selection);

    return 0;
}
```

```
/**
 * Prints a funny face.
 *
 * @param selection - The inputted value which determines which face to print.
 */
void print_face(int selection)
{
    if (selection == 1)
    {
        printf("Have a nice day! :) \n");
    } else if (selection == 2)
    {
        printf(":(\n");
    } else if (selection == 3)
    {
        printf("Meh :\\ \n");
    } else
    {
        hoo();
    }
}

/**
 * Prints an owl face.
 */
void hoo()
{
    printf(" *___*\n {O,O}\n/)___)\n_\"__\"_\n");
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-1_3
Enter 1 for happy, 2 for sad, 3 for neutral, any other integer for random: 1
Have a nice day! :)
bilalhodzic@bhodzic lab04 %
```

```
/*-----------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                -
-       Name:
                                                -
-       Section:
                                        -
-       NetID:
                                            -
-       Date:
                                                -
-----------------------------------------------------------------------*/

/*-----------------------------------------------------------------------
-                                                                  Includes
                                        -
-----------------------------------------------------------------------*/
#include <stdio.h>
#include <math.h>
```

```
/*--------------------------------------------------------------------------
-                                   Notes                                  -
--------------------------------------------------------------------------*/
// Compile with gcc lab04-1_4.c -o lab04-1_4
// Run with ./lab04-1_4
/* This program calculates the energy of one photon
 * of user-inputted wave-length of light */

/*--------------------------------------------------------------------------
-                                                                Implementation
                                        -
--------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   //double speed_of_light!;
          double speed_of_light;
          //double wave-length;
   double wave_length;
          //double ~length_in_meters;
   double length_in_meters;
          //double plank const;
   const double plank = 6.62606957 * pow(10, -34);
   //double 0energy;
          double energy;

   //plank const = 6.62606957 * pow(10, -34); // Planck's constant
   //speed_of_light! = 2.99792458 * pow(10, 8); // Constant for the speed of light
          speed_of_light = 2.99792458 * pow(10, 8); // Constant for the speed of light
          //wave-length = 0;
   wave_length = 0;
          //~length_in_meters = 0;
   length_in_meters = 0;
          //0energy = 0;
   energy = 0;

   printf("Welcome! This program will give the energy, in Joules,\n");
   printf("of 1 photon with a certain wave-length.\n");
   printf("Please input a wave-length of light in nano-meters.\n");
   printf("Please do not enter a negative, or zero, wave-length.\n");
          //scanf("%lf", &wave-length);
   scanf("%lf", &wave_length);

   //if (wave-length > 0.0)
          if (wave_length > 0.0)
   {
      //~length_in_meters = wave-length / pow(10, 9); // Converting nano-meters to meters
                length_in_meters = wave_length / pow(10, 9); // Converting nano-meters to meters
                //0energy = (plank const * speed_of_light!) / ~length_in_meters; // Calculating the energy of 1
photon
      energy = (plank * speed_of_light) / length_in_meters; // Calculating the energy of 1 photon
      printf("A photon with a wave-length of %08.3lf nano-meters, carries "
           //"\napproximately %030.25lf joules of energy.", wave-length, 0energy);
                          "\napproximately %030.25lf joules of energy.", wave_length, energy);
   } else
```

```
    {
        printf("Sorry, you put in an invalid number.");
        printf("Please rerun the program and try again.");
    }

    return 0;
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-1_4
Welcome! This program will give the energy, in Joules,
of 1 photon with a certain wave-length.
Please input a wave-length of light in nano-meters.
Please do not enter a negative, or zero, wave-length.
20
A photon with a wave-length of 0020.000 nano-meters, carries
approximately 0000.000000000000000099322284 joules of energy.%
bilalhodzic@bhodzic lab04 %
```

```
/*-------------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                -
-       Name:
                                                -
-       Section:
                                        -
-       NetID:
                                          -
-       Date:
                                                -
-------------------------------------------------------------------------*/

/*-------------------------------------------------------------------------
-                                                                Includes
                                        -
-------------------------------------------------------------------------*/
#include <stdio.h>

/*-------------------------------------------------------------------------
-                              Prototypes                               -
-------------------------------------------------------------------------*/
int sum_function(int number);

//int main();

/*-------------------------------------------------------------------------
-                               Notes                                   -
-------------------------------------------------------------------------*/
// Compile with gcc lab04-1_5.c -o lab04-1_5
// Run with ./lab04-1_5
/* This program calculates the sum of 1 to x, where x is a user input */

/*-------------------------------------------------------------------------
-                                                            Implementation
                                        -
```

```
----------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
    int input;

    printf("Please input a number from to sum up to: ");

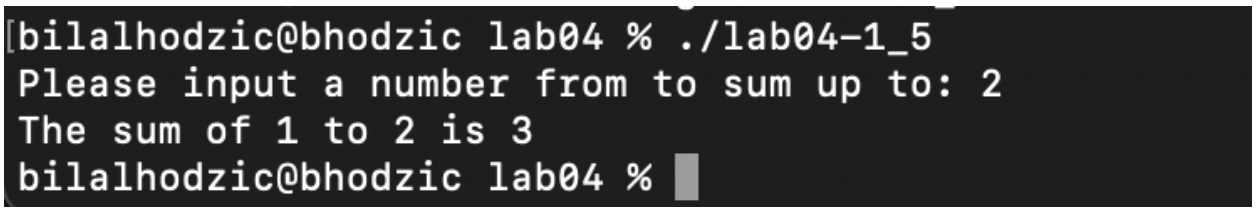
    scanf("%d", &input);

    printf("The sum of 1 to %d is %d\n", input, sum_function(input));

    return 0;
}

/*int main(int argc, char *argv[])
{
    printf("Sum is 32!\n");
}
*/

/**
 * Calculates the sum of 1 to number of a given number.
 *
 * @param number - The number that determines what the sum will stop adding at.
 * @return - The sum of 1 to the given number.
 */
int sum_function(int number)
{
    return (number * (number + 1)) / 2;
}
```



Question 2:

Problem: Find and fix logic errors within several programs to get the correct output.

Analysis: Helps user detect common logic errors within programs.

Design: Used -wall as well as knowledge of code to find logic errors and corrected them until the output was correct.

Testing: Tested code after each change was made until the code functioned properly.

Comments: No comments

Screenshots and source code:

```
/*----------------------------------------------------------------------------
-                        SE 185: Lab 04 - Debugging Code                     -
-        Name:
                                                                             -
-        Section:
                                                                             -
```

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-          NetID:
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-          Date:
                                                    -
-------------------------------------------------------------------------*/

/*-------------------------------------------------------------------------
-                                                                  Includes
                                                    -
-------------------------------------------------------------------------*/
#include <stdio.h>

/*-------------------------------------------------------------------------
-                          Prototypes                                    -
-------------------------------------------------------------------------*/
int is_odd(int number);

int is_even(int number);

/*-------------------------------------------------------------------------
-                          Notes                                         -
-------------------------------------------------------------------------*/
// Compile with gcc lab04-2_1.c -o lab04-2_1
// Run with ./lab04-2_1
/* This program accepts a user input and determines
 * if the integer is an odd or an even number */

/*-------------------------------------------------------------------------
-                                                               Implementation
                                                    -
-------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   //int input == 0;
          int input = 0;

   printf("Please input an integer: ");
   scanf("%d", &input);

   //if (is_odd(input) = 1)
                  if (is_odd(input) == 1)
   {
      printf("%d is an odd number!\n", input);
   }

   //if (is_even(input) = 1)
                  if (is_even(input) == 1)
   {
      printf("%d is an even number!\n", input);
   }

   return 0;
}
```

```
/**
 * Determines whether the given number is even.
 *
 * @param number - The number in question of even status.
 * @return - True if the given number was even.
 */
int is_even(int number)
{
    return !(number % 2);
}

/**
 * Determines whether the given number is odd.
 *
 * @param number - The number in question of odd status.
 * @return - True if the given number was odd.
 */
int is_odd(int number)
{
    return number % 2;
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-2_1
Please input an integer: 2
2 is an even number!
bilalhodzic@bhodzic lab04 %
```

```
/*----------------------------------------------------------------------
-                        SE 185: Lab 04 - Debugging Code                -
-      Name:                                                            -
-      Section:                                                         -
-      NetID:                                                           -
-      Date:                                                            -
----------------------------------------------------------------------*/

/*----------------------------------------------------------------------
-                                                          Includes     -
----------------------------------------------------------------------*/
#include <stdio.h>

/*----------------------------------------------------------------------
-                        Prototypes                                     -
----------------------------------------------------------------------*/
void how_many_whole_digits(int number);

/*----------------------------------------------------------------------
-                        Notes                                          -
```

```
----------------------------------------------------------------------------*/
/* This program calculates the number of digits in a number from 1 to 10000000 */
// Compile with gcc lab04-2_2.c -o lab04-2_2
// Run with ./lab04-2_2

/*----------------------------------------------------------------------------
-                                                                    Implementation
                                                -
----------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   int input;

   printf("Please input an integer from 1 up to 10000000: ");

   scanf("%d", &input);

   if (input > 10000000 || input < 1)
   {
      printf("Invalid number!\n");
      return -1;
   }

         how_many_whole_digits(input);

   return 0;
}

/**
 * This function divides a number by the 10^n, to
 * see if the divided number has "n" digits
 *
 * @param number - The number to determine how many whole digits exist within.
 */
void how_many_whole_digits(int number)
{
         //removed double cast
   if (number / 10000000 != 0)
   {
      printf("8 digits\n");
   } else if (number / 1000000 != 0)
   {
      printf("7 digits\n");
   } else if (number / 100000 != 0)
   {
      printf("6 digits\n");
   } else if (number / 10000 != 0)
   {
      printf("5 digits\n");
   } else if (number / 1000 != 0)
   {
      printf("4 digits\n");
   } else if (number / 100 != 0)
   {
```

```
        printf("3 digits\n");
    } else if (number / 10 != 0)
    {
        printf("2 digits\n");
    } else if (number / 1 != 0)
    {
        printf("1 digit\n");
    }
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-2_2
Please input an integer from 1 up to 10000000: 299
3 digits
bilalhodzic@bhodzic lab04 %
```

```
/*------------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                -
-       Name:
                                                -
-       Section:
                                        -
-       NetID:
                                            -
-       Date:
                                                -
------------------------------------------------------------------------*/

/*------------------------------------------------------------------------
-                                                          Includes
                                        -
------------------------------------------------------------------------*/
#include <stdio.h>

/*------------------------------------------------------------------------
-                          Prototypes                      -
------------------------------------------------------------------------*/
void variable_swap(int i, int j);

void math_swap(int i, int j);

/*------------------------------------------------------------------------
-                          Notes                           -
------------------------------------------------------------------------*/
/* This program accepts two integers as user input and
 * swaps their values using two different methods */
// Compile with gcc lab04-2_3.c -o lab04-2_3
// Run with ./lab04-2_3

/*------------------------------------------------------------------------
-                                                          Implementation
                                        -
------------------------------------------------------------------------*/
```

```c
int main(int argc, char *argv[])
{
    int first = 0, second = 0;
    printf("Please input two integers separated by a space: ");
            //scanf("%lf %lf", &first, &second);
    scanf("%d %d", &first, &second);

    printf("\n");
    variable_swap(first, second);

    printf("\n");
    math_swap(first, second);

    return 0;
}

/**
 * Swaps the values of two integers using a temp variable.
 *
 * @param i - The first value to be swapped.
 * @param j - The second value to be swapped.
 */
void variable_swap(int i, int j)
{
    printf("Now doing a swap using an extra variable: \n");
    printf("Before Swap: First: %d, Second: %d\n", i, j);

    int temp = i;
    i = j;
    j = temp;

    printf("After Swap: First: %d, Second: %d\n", i, j);
}

/**
 * Swaps the values of two integers without using a temp variable.
 *
 * @param i - The first value to be swapped.
 * @param j - The second value to be swapped.
 */
void math_swap(int i, int j)
{
    printf("Now doing a swap using addition and subtraction: \n");
    printf("Before Swap: First: %d, Second: %d\n", i, j);

    i = i + j;
    j = i - j;
    i = i - j;

    printf("After Swap: First: %d, Second: %d\n", i, j);
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-2_3
Please input two integers separated by a space: 2 4

Now doing a swap using an extra variable:
Before Swap: First: 2, Second: 4
After Swap: First: 4, Second: 2

Now doing a swap using addition and subtraction:
Before Swap: First: 2, Second: 4
After Swap: First: 4, Second: 2
bilalhodzic@bhodzic lab04 %
```

```c
/*-------------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                 -
-       Name:
                                                                          -
-       Section:
                                                                  -
-       NetID:
                                                                    -
-       Date:
                                                                  -
-------------------------------------------------------------------------*/

/*-------------------------------------------------------------------------
-                                                                Includes
                                                                  -
-------------------------------------------------------------------------*/
#include <stdio.h>

/*-------------------------------------------------------------------------
-                          Prototypes                                    -
-------------------------------------------------------------------------*/
double voltage(double resistance, double current);

double resistance(double voltage, double current);

double current(double voltage, double resistance);

/*-------------------------------------------------------------------------
-                          Notes                                         -
-------------------------------------------------------------------------*/
// Compile with gcc lab04-2_4.c -o lab04-2_4
// Run with ./lab04-2_4
/* This program calculates values of resistances,
 * voltages, or current using Ohm's Law */

/*-------------------------------------------------------------------------
-                                                           Implementation
                                                                  -
```

```
------------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
    int selection = 0;
            //int v, i, r;
    double v, i, r;

    printf("selection:\n1 for voltage\n2 for resistance\n3 for current\n");

    scanf("%d", &selection);

    if (selection > 3 || selection < 1)
    {
        printf("Invalid number\n");
        return -1;
    }

    printf("Enter floating point numbers for input...\n");
    if (selection == 1)
    {
        printf("Please enter a resistance value: ");
        scanf("%lf", &r);

        printf("Please enter a current value: ");
        scanf("%lf", &i);

        printf("Your voltage is: %lf Volts\n", voltage(r, i));
    } else if (selection == 2)
    {
        printf("Please enter a voltage value: ");
        scanf("%lf", &v);

        printf("Please enter a current value: ");
        scanf("%lf", &i);

        printf("Your Resistance is: %lf Ohms\n", resistance(v, i));

    } else if (selection == 3)
    {
        printf("Please enter a resistance value: ");
        scanf("%lf", &r);

        printf("Please enter a voltage value: ");
        scanf("%lf", &v);

        printf("Your current is: %lf Amps\n", current(v, r));
    }

    return 0;
}

/**
 * Given the resistance and current, calculates and returns the voltage.
 *
```

```
 * @param resistance - The resistance used to calculate the voltage.
 * @param current - The current used to calculate the voltage.
 * @return - The voltage calculated from the resistance and current.
 */
double voltage(double resistance, double current)
{
   return resistance * current;
}

/**
 * Given the voltage and current, calculates and returns the resistance.
 *
 * @param voltage - The voltage used to calculate the resistance.
 * @param current - The resistance used to calculate the resistance.
 * @return - The resistance calculated from the voltage and current.
 */
double resistance(double voltage, double current)
{
   return voltage / current;
}

/**
 * Given the voltage and resistance, calculates and returns the current.
 *
 * @param voltage - The voltage used to calculate the current.
 * @param resistance - The resistance used to calculate the current.
 * @return - The current calculated from the voltage and resistance.
 */
double current(double voltage, double resistance)
{
   return voltage / resistance;
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-2_4
selection:
1 for voltage
2 for resistance
3 for current
1
Enter floating point numbers for input...
Please enter a resistance value: 2
Please enter a current value: 2
Your voltage is: 4.000000 Volts
bilalhodzic@bhodzic lab04 %
```

```
/*----------------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                   -
-          Name:                                                             -
-          Section:                                                          -
```

```
-          NetID:
                                                    -
-          Date:
                                                              -
----------------------------------------------------------------------------*/

/*----------------------------------------------------------------------------
-                                                                    Includes
                                                    -
----------------------------------------------------------------------------*/
#include <stdio.h>

/*----------------------------------------------------------------------------
-                              Prototypes                                    -
----------------------------------------------------------------------------*/
int is_positive(int number);

int is_negative(int number);

int is_zero(int number);

/*----------------------------------------------------------------------------
-                                  Notes                                     -
----------------------------------------------------------------------------*/
// Compile with gcc lab04-2_5.c -o lab04-2_5
// Run with ./lab04-2_5
/* This program takes in an integer from the user and
 * checks to see if it is a whole number. Additionally,
 * it will tell the user if the number is positive,
 * negative, or zero.
 *
 * Example:
 *      $ ./lab04_2-5
 *      $ Please type a number between -10000 and 10000: -500
 *      $ -500 is non-positive and -500 is non-zero and -500 is non-whole number.
 */

/*----------------------------------------------------------------------------
-                                                                Implementation
                                                    -
----------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   int number;

   printf("Please type a number between -10000 and 10000: ");
   scanf("%d", &number);

   if (number > 10000 | number < -10000)
   {
      printf("Number is out of range!\n");
      return -1;
   }
```

```c
    if ((is_positive(number) & !is_negative(number)) | is_zero(number))
    {
        printf("%d is a whole number.\n", number);
    } else
    {
        printf("%d is non-whole number.\n", number);
    }

    return 0;
}

/**
 * Determines if the given number is positive.
 *
 * @param number - The number in question of whether it is positive or not.
 * @return - Whether the given number is positive.
 */
int is_positive(int number)
{
    if (number > 0)
    {
        printf("%d is positive and ", number);
        return 1;
    }

    printf("%d is non-positive and ", number);
    return 0;
}

/**
 * Determines if the given number is negative.
 *
 * @param number - The number in question of whether it is negative or not.
 * @return - Whether the given number is negative.
 */
int is_negative(int number)
{
    if (number < 0)
    {
        printf("%d is negative and ", number);
        return 1;
    }

    printf("%d is non-negative and ", number);
    return 0;
}

/**
 * Determines if the given number is 0.
 *
 * @param number - The number in question of whether it is 0 or not.
 * @return - Whether the given number is 0.
 */
int is_zero(int number)
```

```
{
   //if (number = 0)
           if (number == 0)
   {
      //printf("%d is zero and ", n);
                   printf("%d is zero and ", number);
      return 1;
   }

   printf("%d is non-zero and ", number);
   return 0;
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-2_5
Please type a number between -10000 and 10000: 299
299 is positive and 299 is non-negative and 299 is non-zero and 299 is a whole number.
bilalhodzic@bhodzic lab04 %
```

Question 3:

Problem: Fix a program that contains both logic and syntax errors.

Analysis: Allows the user to practice debugging code with both forms of errors.

Design:

Used the compiler errors to find syntax errors in the code. Then used -wall to find logic errors. Fixed all errors.

Testing: Tested after each change

Comments: no comments.

Screenshots and source code:

```
/*----------------------------------------------------------------------
-                          SE 185: Lab 04 - Debugging Code                          -
-          Name:
                                                  -
-          Section:
                                               -
-          NetID:
                                                -
-          Date:
                                                  -
----------------------------------------------------------------------*/

/*----------------------------------------------------------------------
-                                                                  Includes
                                                  -
----------------------------------------------------------------------*/
#include <stdio.h>

#include <time.h>
//Added Next line
#include <stdlib.h>

///----------------------------------------------------------------------
/*----------------------------------------------------------------------
-                      Prototypes                      -
```

```
----------------------------------------------------------------------------*/
char ask_to_play(int times_played);

int select_random_number();
//added next line
void run_game(int computer_number);

/*---------------------------------------------------------------------------
-                                   Notes                                   -
----------------------------------------------------------------------------*/
// Compile with gcc lab04-3.c -o lab04-3
// Run with ./lab04-3
/* This program will play a simple Guessing Game with the computer. */

/*---------------------------------------------------------------------------
-                                                                  Implementation
                                        -
//--------------------------------------------------------------------------*
----------------------------------------------------------------------------*/
int main(int argc, char *argv[])
{
   char prompt = '-';
   int played = 0, computer_guess = 0;

   prompt = ask_to_play(played);
   played = 1;

   while (prompt == 'y')     /* This line does not contain an error */
   {
      computer_guess = select_random_number();
      run_game(computer_guess);
      //prompt = ask_to_play(playd);
                  prompt = ask_to_play(played);
   }

   printf("\n\nThanks for playing!\n");

   return 0;
}

/**
 * Asks the player if they want to play the Guessing Game.
 *
 * @param played_before - Whether the player has played a round of the game before or not.
 * @return - Whether the player wants to play again or not.
 */
char ask_to_play(int played_before)
{
   char yes_or_no;

   if (!played_before)    /* This line does not contain an error */
   {
      printf("Do you want to play a game? "
           "Enter 'y' to play, anything else not to play. :(\n  -> ");
```

```
      scanf(" %c", &yes_or_no);
   } else
   {
      scanf(" %c", &yes_or_no);
   }

   printf("%c", yes_or_no);

   return yes_or_no;
}

/**
 * Generates a random number between 1 to 100, inclusive.
 *
 * @return - A number between 1 and 100, inclusive.
 */
int select_random_number()
{
   srand(time(NULL));
   return rand() % 100;
}

/**
 * Starts the Guessing Game for you to play!
 *
 * @param computer_number - The randomly generated number to be used for the game.
 */
void run_game(int computer_number)
{
   int number = 0;
          //added next line
          int correct = 0;
   printf("\n\nYou are guessing a number. The options are 1 through 100.\n\n");
   printf("What is your guess on what number I will select?\n  -> ");
          //scanf("%c", &number);
   scanf("%d", &number);

   while (!correct)    /* This line does not contain an error */
   {
      if (number < 1 || number > 100)
      {
         printf("\nYour number is not within the correct range of numbers. Guess again\n  -> ");
                  //} else if (number = computer_number)
      } else if (number == computer_number)
      {
         printf("\nThe number was %d!\n", computer_number);
         printf("\nYou guessed the number correctly!\n\n"
               "Do you want to play again? ('y' for yes)\n  -> ");
         correct = 1;
      //} else if (number < computer_number);
                  } else if (number < computer_number)
      {
         printf("\nYou guessed too low. Enter another guess.\n  -> ");
      } else
```

```
    {
       printf("\n You guessed too high. Enter another guess.\n  -> ");
    }

    scanf("%d", &number);
  }
}
```

```
bilalhodzic@bhodzic lab04 % ./lab04-3
Do you want to play a game? Enter 'y' to play, anything else not to play. :(
  -> y
y

You are guessing a number. The options are 1 through 100.

What is your guess on what number I will select?
  -> 20

You guessed too low. Enter another guess.
  -> 40

You guessed too low. Enter another guess.
  -> 60

 You guessed too high. Enter another guess.
  -> 50

 You guessed too high. Enter another guess.
  -> 45

You guessed too low. Enter another guess.
  -> 46

You guessed too low. Enter another guess.
  -> 47

You guessed too low. Enter another guess.
  -> 48

You guessed too low. Enter another guess.
  -> 49

The number was 49!

You guessed the number correctly!

Do you want to play again? ('y' for yes)
  -> n
n

Thanks for playing!
bilalhodzic@bhodzic lab04 %
```

Extra questions.

1. Lab04-1_1:

   Line29- added semicolon.
   Error: Missing semicolon
   Line33- added end quote in printf
   Error: missing end quote in printf
   Line35- added semicolon.
   Error: missing semicolon
   Line42- added open brace

Error: Missing open brace for amount of closing braces

Lab04-1_2:

Line18- changed declarations of parameters.

Error- Wrong declaration in prototype compared to actual function.

Line35- Added variable declaration

Error- Undeclared variable in later lines.

Lab04-1_3:

Line14, Line 16- Added new include.

Error: Missing includes for functions.

Line22- Added prototype.

Error- Function not declared.

Lab04-1_4:

Line29,31,33,37- Changed variable name

Error- Invalid variable names.

Line35,39- Deleted line 39 adjusted line 35 to initialize constant in line

Error- Constant cant must be initialized immediately.

Line41,43,45,47,54,60,57,62,63,65- Changed variable name in line

Error- Invalid names before

Lab04-1_5:

Line19,44- Removed unnecessary prototype and function

Error- Cannot declare main multiple times.

Lab04-2_1:

Line35- Removed unnecessary equals

Error- Does not declare variable with 2 equals

Line41,47- Added another equal sign

Error- Double equals is needed for comparing

Lab04-2_2:

Line57 and below- Removed all double casts

Error- Integer division is needed to calculate num of digits so double cast is unnecessary

Lab04-2_3:

Line 37- Changed format specifier

Error- Wrong format specifier does not store variable correctly

Lab04-2_4:

Line 38- Changed from int to double

Error- Double is needed for correct calculations.

Lab04-2_5:

Line111- Added double equals

Error- Double equals needed for comparing

Line114- Changed variable name in string

Error- Wrong variable name

Question 2:

-Wall is used to find logic errors within the code that may contribute to the code not running correctly. All logic errors were fixed.