**Assignment # 02**

**Submission due date: 4th August 2020 11:59AM**

Use of if-else Statement

1. What would be the output of the following programs? Fill out the form below. Only filling out the form carry marks, if your result of dry run doesn’t match with the result of compiler run, it will not reduce your marks. If the answer of your dry run and compiler run doesn’t match then we will discuss it in the class.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Program | Result of your Dry Run | Result of Compiler Run |
| a. | main( )  {  int a = 300, b, c ;  if ( a >= 400 )  b = 300 ;  c = 200 ;  printf ( "\n%d %d", b, c ) ;  } | 0 200 |  |
| b. | main( )  {  int a = 500, b, c ;  if ( a >= 400 )  b = 300 ;  c = 200 ;  printf ( "\n%d %d", b, c ) ;  } |  |  |
| c. | main( )  {  int x = 3, y = 5 ;  if ( x == 3 )  printf ( "\n%d", x ) ;  else ;  printf ( "\n%d", y ) ;  } |  |  |
| d. | main( )  {  int x = 3 ;  float y = 3.0 ;  if ( x == y )  printf ( "\nx and y are equal" ) ;  else  printf ( "\nx and y are not equal" ) ;  } |  |  |
| e. | main( )  {  int x = 3, y, z ;  y = x = 10 ;  z = x < 10 ;  printf ( "\nx = %d y = %d z = %d", x, y, z ) ;  } |  |  |
| f. | main( )  {  int k = 35 ;  printf ( "\n%d %d %d", k == 35, k = 50, k > 40 ) ;  } |  |  |

1. Correct the programs given below according to its explanation.
   1. The program given below tries to compare two float values. The output of the program is not the desired one.

|  |  |
| --- | --- |
| **Original Code** | **Your corrected code** |
| int main()  {  float a = 12.25, b = 13.0 ;  if ( a = b )  printf ( "\na and b are equal" ) ;  } |  |

* 1. Run the program and try to find out the ASCII values of mentioned characters

|  |  |
| --- | --- |
| **Original Code** | **ASCII values** |
| int main()  {  if ( 'X' < 'x' )  printf ( "\nascii value of X is smaller than that of x" ) ;  } |  |

* 1. The program below gives syntax error, please correct it:

|  |  |
| --- | --- |
| **Original Code** | **Your corrected code** |
| int main()  {  int x = 10 ;  if x >= 2  printf ( "\n%d", x ) ;  } |  |

* 1. The program below gives syntax error, please correct it:

|  |  |
| --- | --- |
| **Original Code** | **Your corrected code** |
| int main()  {  int x = 30, y = 40 ;  if ( x == y )  printf( "x is equal to y" ) ;  elseif ( x > y )  printf( "x is greater than y" ) ;  elseif ( x < y )  printf( "x is less than y" ) ;  } |  |

1. Write C program for the following:
   1. A five-digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not.
   2. If a five digit number is input through the keyboard, write a program to calculate the sum of its digits. If the given number is more than 5 digits then print the message “You have entered a wrong number”. (Hint: use % operator)
   3. If a four digit number is input through the keyboard, write a program to reverse the number. Determine whether the original and reversed numbers are equal or not. If both numbers are equal then print “It is a palindrome number”, otherwise print the message that “It is not a palindrome number”.
   4. If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example if the number that is input is 1239 then the output should be displayed as 2340. If any digit in the given number is 9 then using if statement, make it 0.
   5. The ATM machine can only give out the currency notes of 1000 and 500. Your program should print how many currency notes of 1000 and 500 needs to be dispatched out of the machine. For example, if the user has entered the amount to be withdrawn to 25500 then your program should print 25 notes of 1000 and 1 note of 500. You have to ensure following conditions using if-else statement:
      1. If the entered amount in more than 50000 then print the message that “The amount is more than 50000”
      2. If the amount is not the multiple of 500 then print the message that “Please enter a valid amount which is multiple of 500”

(Hint: use % operator)

* 1. If the ages of X, Y and Z are input through the keyboard, write a program to determine the youngest of the three.
  2. Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees.
  3. Find the absolute value of a number entered through the keyboard. For example, if the given number is 5 then the result would be 5, or if the given number is -5 then the result will be 5.
  4. Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin (0, 0).

Use of Logical Operator

1. What will be the value of the following logical expressions if a = 10, b = 12 and c = 0. Remember that the Output will be either 0 (False)or 1 (True).
   * 1. a != 6 && b > 5
     2. a == 9 || b < 3
     3. ! ( a < 10 )
     4. ! ( a > 5 && c )
     5. 5 && c != 8 || !c
2. What is the output of the following program:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Program | Result of your Dry Run | Result of Compiler Run |
| a. | main( )  {  int i = 4, j = -1, k = 0, w, x, y, z ;  w = i || j || k ;  x = i && j && k ;  y = i || j && k ;  z = i && j || k ;  printf ( "\nw = %d x = %d y = %d z = %d", w, x, y, z ) ;  } | W = 1  X = 0  Y = 1 z = 1 |  |
| b. | main( )  {  int i = 4, j = -1, k = 0, y, z ;  y = i + 5 && j + 1 || k + 2 ;  z = i + 5 || j + 1 && k + 2 ;  printf ( "\ny = %d z = %d", y, z ) ;  } |  |  |
| c. | main( )  {  int x = 20 , y = 40 , z = 45 ;  if ( x > y && x > z )  printf( "x is big" ) ;  else if ( y > x && y > z )  printf( "y is big" ) ;  else if ( z > x && z > y )  printf( "z is big" ) ;  } |  |  |
| d. | main( )  {  int a = 40 ;  if ( a > 40 && a < 45 )  printf ( "a is greater than 40 and less than 45" ) ;  else  printf("%d", a);  } |  |  |

1. Write a C program for the following problems:
   1. Any year is entered through the keyboard, write a program to determine whether the year is leap or not. Use the logical operators && and ||.
      1. A year is a leap year if it is divisible by 4 and not divisible by 100. OR a year is a leap year if it is divisible by 400.
   2. Any character is entered through the keyboard, write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol.

The following table shows the range of ASCII values for various characters.

* + 1. A – Z (ASCII values 65 – 90)
    2. a – z (ASCII values 97 – 122)
    3. 0 – 9 (ASCII values 48 – 57)
    4. Special Characters (ASCII values 0 - 47, 58 - 64, 91 - 96, 123 – 127)
  1. An Insurance company follows following rules to calculate premium.
     1. If a person’s health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then the premium is Tk. 4 per thousand and his policy amount cannot exceed Tk. 2 lakhs.
     2. If a person satisfies all the above conditions except that the sex is female then the premium is Tk. 3 per thousand and her policy amount cannot exceed Tk. 1 lakh.
     3. If a person’s health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then the premium is Tk. 6 per thousand and his policy cannot exceed Tk. 10,000.
     4. In all other cases the person is not insured.
  2. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is valid or not. The triangle is valid if the sum of two sides is greater than the largest of the three sides.
  3. In a company, worker efficiency is determined on the basis of the time required for a worker to complete a particular job. If the time taken by the worker is between 2 – 3 hours, then the worker is said to be highly efficient. If the time required by the worker is between 3 – 4 hours, then the worker is ordered to improve speed. If the time taken is between 4 – 5 hours, the worker is given training to improve his speed, and if the time taken by the worker is more than 5 hours, then the worker has to leave the company. If the time taken by the worker is input through the keyboard, find the efficiency of the worker.