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RAPID APPLICATION DEVELOPMENT

CONTROL LOGIC-Exercise 02

01)

```
9     internal class Program
10    {
          0 references
11        static void Main(string[] args)
12        {
13            int i = 10;
14            int j = 5;
15
16            Console.WriteLine($"Before exchange: FirstNumber = {i}, SecondNumber = {j}");
17
18            if (i > j)
19            {
20
21                int temp = i;
22                i = j;
23                j = temp;
24            }
25
26            Console.WriteLine($"After exchange: FirstNumber = {i}, SecondNumber = {j}");
27
28    }
29    }
30}
31
```

Output

```
C:\WINDOWS\system32\cmd.
Before exchange: FirstNumber = 10, SecondNumber = 5
After exchange: FirstNumber = 5, SecondNumber = 10
Press any key to continue . . .
```

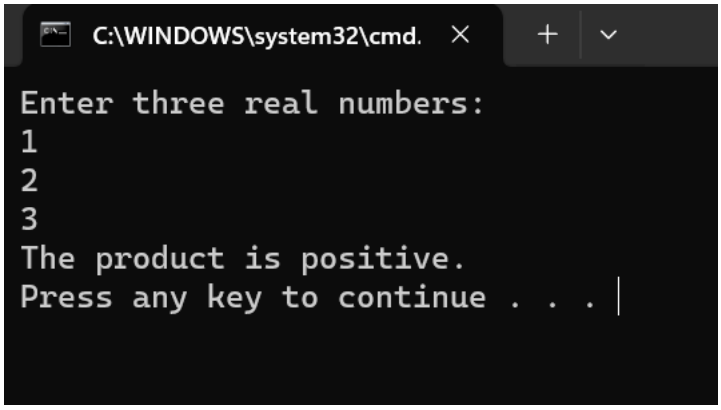
02)

```
internal class Program
{
    0 references
    static void Main(string[] args)
    {
        Console.WriteLine("Enter three real numbers:");

        double num1 = Convert.ToDouble(Console.ReadLine());
        double num2 = Convert.ToDouble(Console.ReadLine());
        double num3 = Convert.ToDouble(Console.ReadLine());

        if (num1 == 0 || num2 == 0 || num3 == 0)
        {
            Console.WriteLine("The product is zero.");
        }
        else if ((num1 > 0 && num2 > 0 && num3 > 0) || (num1 < 0 && num2 < 0 && num3 < 0))
        {
            Console.WriteLine("The product is positive.");
        }
        else
        {
            Console.WriteLine("The product is negative.");
        }
    }
}
```

Output



03)

```
12          {
13              Console.WriteLine("Enter three integers:");
14              int num1 = Convert.ToInt32(Console.ReadLine());
15              int num2 = Convert.ToInt32(Console.ReadLine());
16              int num3 = Convert.ToInt32(Console.ReadLine());
17              if (num1 >= num2)
18              {
19                  if (num1 >= num3)
20                  {
21                      Console.WriteLine($"Biggest number is: {num1}");
22                  }
23                  else
24                  {
25                      Console.WriteLine($"Biggest number is: {num3}");
26                  }
27              }
28              else
29              {
30                  if (num2 >= num3)
31                  {
32                      Console.WriteLine($"Biggest number is: {num2}");
33                  }
34                  else
35                  {
36                      Console.WriteLine($"Biggest number is: {num3}");
37                  }
38              }
```

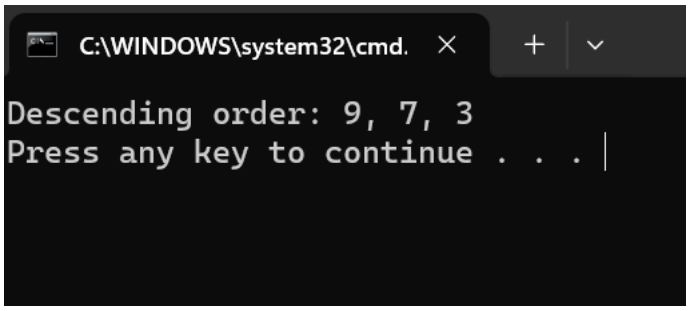
Output

```
C:\WINDOWS\system32\cmd.
Enter three integers:
19
21
01
Biggest number is: 21
Press any key to continue . . .
```

04)

```
13          double num1 = 7; double num2 = 3; double num3 = 9;
14          if (num1 >= num2)
15          {
16              if (num2 >= num3)
17              {Console.WriteLine($"Descending order: {num1}, {num2}, {num3}");
18              }
19              else if (num1 >= num3)
20              {Console.WriteLine($"Descending order: {num1}, {num3}, {num2}");
21              }
22              else
23              {Console.WriteLine($"Descending order: {num3}, {num1}, {num2}");
24              }
25          }
26          else
27          {
28              if (num1 >= num3)
29              {
30                  Console.WriteLine($"Descending order: {num2}, {num1}, {num3}");
31              }
32              else if (num2 >= num3)
33              {
34                  Console.WriteLine($"Descending order: {num2}, {num3}, {num1}");
35              }
36              else
37              {
38                  Console.WriteLine($"Descending order: {num3}, {num2}, {num1}");
39              }
```

Output



05)

```
12          {Console.Write("Enter a digit (0-9): ");
13              char inputDigit = Console.ReadKey().KeyChar;
14              Console.WriteLine();
15              if (char.IsDigit(inputDigit))
16              {int digit = int.Parse(inputDigit.ToString());
17                  switch (digit){
18                      case 0:
19                          Console.WriteLine(" Zero");
20                          break;
21                      case 1:
22                          Console.WriteLine(" One");
23                          break;
24                      case 2:
25                          Console.WriteLine(" Two");
26                          break;
27                      case 3:
28                          Console.WriteLine(" Three");
29                          break;
30                      case 4:
31                          Console.WriteLine(" Four");
32                          break;
33                      case 5:
34                          Console.WriteLine(" Five");
35                          break;
36                      case 6:
37                          Console.WriteLine(" Six");
38                          break;
39                      case 7:
40                          Console.WriteLine(" Seven");
41                          break;
42                      case 8:
43                          Console.WriteLine(" Eight");
44                          break;
45                      case 9:
46                          Console.WriteLine(" Nine");
47                          break;
48                  }
49              }
50              else
51              {
52                  Console.WriteLine("Invalid input.Please enter a digit (0-9).");
53              }
54          }
55      }
56  }
57
```

Output

```
C:\WINDOWS\system32\cmd.
Enter a digit (0-9): 9
 Nine
Press any key to continue . . .
```

06)

```
12      {
13          Console.WriteLine("Enter coefficients for the quadratic equation (a*x^2 + b*x + c = 0):");
14          Console.Write("Enter coefficient a: ");
15          double a = Convert.ToDouble(Console.ReadLine());
16
17          Console.Write("Enter coefficient b: ");
18          double b = Convert.ToDouble(Console.ReadLine());
19
20          Console.Write("Enter coefficient c: ");
21          double c = Convert.ToDouble(Console.ReadLine());
22          double discriminant = b * b - 4 * a * c;
23          if (discriminant > 0)
24          {
25              double root1 = (-b + Math.Sqrt(discriminant)) / (2 * a);
26              double root2 = (-b - Math.Sqrt(discriminant)) / (2 * a);
27              Console.WriteLine($"The quadratic equation has two distinct real roots: {root1} and {root2}");
28          }
29          else if (discriminant == 0)
30          {
31              double root = -b / (2 * a);
32              Console.WriteLine($"The quadratic equation has one real root (double root): {root}");
33          }
34          else
35          {
36              Console.WriteLine("The quadratic equation has no real roots.");
37          }
38      }
```

Output

```
C:\WINDOWS\system32\cmd.
Enter coefficients for the quadratic equation (a*x^2 + b*x + c = 0):
Enter coefficient a: 1
Enter coefficient b: -2
Enter coefficient c: 1
The quadratic equation has one real root (double root): 1
Press any key to continue . . .
```

07)

```
11      static void Main(string[] args)
12      {
13          Console.WriteLine("Enter five variables:");
14          double variable1 = Convert.ToDouble(Console.ReadLine());
15          double variable2 = Convert.ToDouble(Console.ReadLine());
16          double variable3 = Convert.ToDouble(Console.ReadLine());
17          double variable4 = Convert.ToDouble(Console.ReadLine());
18          double variable5 = Convert.ToDouble(Console.ReadLine());
19          double greatest = variable1;
20          if (variable2 > greatest)
21          {
22              greatest = variable2;
23          }
24          if (variable3 > greatest)
25          {
26              greatest = variable3;
27          }
28          if (variable4 > greatest)
29          {
30              greatest = variable4;
31          }
32          if (variable5 > greatest)
33          {
34              greatest = variable5;
35          }
36          Console.WriteLine($"The greatest variable is: {greatest}");
37      }
```

Output

```
C:\WINDOWS\system32\cmd.
Enter five variables:
1
2
3
4
5
The greatest variable is: 5
Press any key to continue . . .
```

08)

```
12          {
13              Console.WriteLine("Choose a variable type: 1 - int, 2 - double, 3 - string");
14              int choice = Convert.ToInt32(Console.ReadLine());
15
16              switch (choice)
17              {
18                  case 1:
19                      Console.Write("Enter an integer: ");
20                      int intVariable = Convert.ToInt32(Console.ReadLine());
21                      intVariable++;
22                      Console.WriteLine($"Increased integer value: {intVariable}");
23                      break;
24
25                  case 2:
26                      Console.Write("Enter a double: ");
27                      double doubleVariable = Convert.ToDouble(Console.ReadLine());
28                      doubleVariable++;
29                      Console.WriteLine($"Increased double value: {doubleVariable}");
30                      break;
31
32                  case 3:
33                      Console.Write("Enter a string: ");
34                      string stringVariable = Console.ReadLine();
35                      stringVariable += "*";
36                      Console.WriteLine($"Appended string value: {stringVariable}");
37                      break;
39                  default:
40                      Console.WriteLine("Invalid choice. Please choose 1, 2, or 3.");
41                      break;
42              }
43          }
44      }
45  }
```

Output

```
C:\WINDOWS\system32\cmd.
Choose a variable type: 1 - int, 2 - double, 3 - string
3
Enter a string: John
Appended string value: John*
Press any key to continue . . .
```

09)

```
        {
            Console.WriteLine("Enter 5 integer numbers separated by spaces:");
            string[] inputNumbers = Console.ReadLine().Split(' ');
            int[] numbers = new int[5];

            for (int i = 0; i < 5; i++)
            {
                if (int.TryParse(inputNumbers[i], out numbers[i]) == false)
                {
                    Console.WriteLine("Invalid input. Please enter valid integers.");
                    return;
                }
            }
            for (int subset = 1; subset < (1 << 5); subset++)
            {
                int currentSum = 0;
                string subsetExpression = "";
                for (int i = 0; i < 5; i++)
                {
                    if ((subset & (1 << i)) != 0)
                    {
                        currentSum += numbers[i];
                        subsetExpression += $"{(currentSum > 0 ? "+" : "")}{numbers[i]}";
                    }
                }
                if (currentSum == 0)
                {
                    Console.WriteLine($"Subset with sum 0 found: {subsetExpression.Substring(1)} = 0");
                    return;
                }
            }
            Console.WriteLine("No subset with sum 0 found.");
        }
    }

}
```

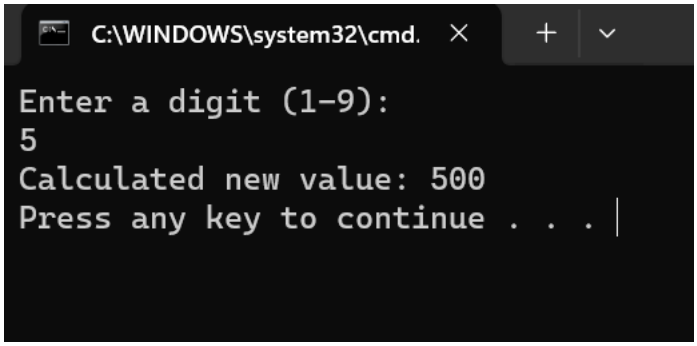
Output

```
C:\WINDOWS\system32\cmd.
Enter 5 integer numbers separated by spaces:
1 1 2 -2 -1
Subset with sum 0 found: 1+1-2 = 0
Press any key to continue . . .
```

10)

```
12          {
13              Console.WriteLine("Enter a digit (1-9):");
14
15              if (int.TryParse(Console.ReadLine(), out int digit))
16              {
17                  int result;
18
19                  switch (digit)
20                  {
21                      case 1:
22                      case 2:
23                      case 3:
24                          result = digit * 10;
25                          break;
26
27                      case 4:
28                      case 5:
29                      case 6:
30                          result = digit * 100;
31                          break;
32
33                      case 7:
34                      case 8:
35                      case 9:
36                          result = digit * 1000;
37                          break;
38
39                      default:
40                          Console.WriteLine("Error: Invalid digit entered. Please enter a digit between 1 and 9.");
41                          return;
42                  }
43
44                  Console.WriteLine($"Calculated new value: {result}");
45              }
46              else
47              {
48                  Console.WriteLine("Error: Input is not a valid digit. Please enter a digit between 1 and 9.");
49              }
50          }
51      }
52  }
53
```

Output



11)

```
        Console.WriteLine("Enter a number in the range [0...999]:");

        if (int.TryParse(Console.ReadLine(), out int number) && number >= 0 && number <= 999)
        {
            string result = ConvertToWords(number);
            Console.WriteLine(result);
        }
        else
        {
            Console.WriteLine("Error: Invalid input. Please enter a number in the range [0...999].");
        }
    }
    1 reference
    static string ConvertToWords(int number)
    {
        if (number == 0)
        {
            return "Zero";
        }
        string[] units = { "", "One", "Two", "Three", "Four", "Five", "Six", "Seven", "Eight", "Nine" };
        string[] teens = { "", "Eleven", "Twelve", "Thirteen", "Fourteen", "Fifteen", "Sixteen", "Seventeen", "Eighteen", "Nineteen" };
        string[] tens = { "", "Ten", "Twenty", "Thirty", "Forty", "Fifty", "Sixty", "Seventy", "Eighty", "Ninety" };
        string result = "";
        int hundreds = number / 100;
        int tensPart = number % 100 / 10;
        int unitsPart = number % 10;
```

```
            if (hundreds > 0)
            {
                result += $"{units[hundreds]} Hundred";
            }
            if (tensPart > 0 || unitsPart > 0)
            {
                if (hundreds > 0)
                {
                    result += " and ";
                }
                if (tensPart == 1 && unitsPart > 0)
                {
                    result += teens[unitsPart];
                }
                else
                {
                    result += $"{tens[tensPart]}";
                    if (unitsPart > 0)
                    {
                        result += $"-{units[unitsPart]}";
                    }
                }
            }
            return result;
        }
    }
    }
```

Output

```
C:\WINDOWS\system32\cmd.
Enter a number in the range [0...999]:
561
Five Hundred and Sixty-One
Press any key to continue . . .
```