**Review Questions chapter 2**

For each of the following problems write a defining table. Then write an algorithm with numbered steps to solve the problem. Then label each step with the name of the basic computer operation that the computer will use during that step.

1. Your company needs a program to compute the amount to charge customers for mowing their lawns for an entire season. An employee will type in the total area of the customer’s lawn in square feet. Your company charges 10 cents per square foot to mow a lawn one time and will mow each lawn once a week for 15 weeks.

**Defining Table**

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| Total Area of the customer’s lawn in square feet | For each total area   * Compute the total charge to mow one time * Multiply by 15 to compute the total charge for the entire season. | Total charge for entire season |

**Algorithm steps**

1. Get total area of customer’s lawn in square feet. Receiving Data
2. For each area of lawn Perform the arithmetic
3. Compute total charge to mow one time
4. Multiply with 15 to get total charge to mow the entire season
5. Total charge to mow Output
6. You have been asked to write a computer program that will output an employee’s after-tax pay. Your program will read from the keyboard the number of regular hours and overtime hours that the employee worked and the employee’s regular hourly wage. The employee is paid a bonus of 1.5 times regular pay for each overtime hour worked. Tax is 15% of the employee’s gross pay.

**Defining Table**

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| Regular hours  Overtime hours  Regular hourly wage | Regular pay = regular hours \* regular wage  Overtime pay = overtime hours \* regular pay \* 1.5  Gross pay = regular pay + overtime pay  Tax = gross pay \* 0.15  Net pay = gross pay - tax | Net pay |

**Algorithm steps**

1. Get the regular hour.
2. Get the overtime hour. Receive data
3. Get the regular hourly wage.
4. Compute the regular pay by multiplying regular hour with regular hourly wage.
5. Calculate overtime pay= overtime hours \* regular pay \* 1.5. Perform

arithmetic

1. Compute gross pay by adding together regular pay and overtime pay.
2. Compute tax = gross pay \* 0.15.
3. Net pay = gross pay – tax. Output
4. Which of the following are control structures? (Mark all that apply.)
5. input
6. computation
7. sequence
8. selection
9. repetition
10. try, catch, and throw
11. storage
12. output

**Example 2**

You have been asked to write a program that will read from the keyboard the radius of a circle and will output to the monitor the diameter, circumference, and area of the circle.

**Defining Table**

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| Radius of a circle | For radius of a circle   * Calculate diameter by multiplying radius by 2 * Compute circumference = 2 \* π \* radius * Compute the area = 2 \* π \* (radius)2 | Diameter  Circumference  Area |

**Algorithm steps**

* + 1. Record the radius of the circle
    2. For each given radius of a circle
       - 1. Compute the diameter = 2 \* radius
         2. Compute the circumference = 2 \* π \* radius
         3. Compute the area = 2 \* π \* (radius)2