**EXCERSISE 1**

**QUESTIONS**

1. What is the different between procedural and object-oriented programming ?
2. What is an algorithm, explain it and give the example ?
3. There are six basic computer operations, explain each of these operations ?
4. How many basic control structures, explain those of them ?

**ANSWER**

1.Procedural Programming

* Template based
* Functions / Subroutines /

Process / Rules has to be

defined at early stage

* A good chance for very high

interdependency between

modules

* High complexity
* Yet considered effective,efficient
* Database very-well normalized

to all projects

* Difficult to manage and to

Change

Object Oriented Programming

* Object approach for

process, procedures and for

real objects

* Inheritance
* Start simple
* Develop more complex

object by inheritance

• Low chance of interdependence

• Database is normalized to

the object

• May-be not efficient

• Resource hungry

2. Algorithm

* Meaning : A set of well defined instructions to be used in problem-solving operations
* Example : **1**.Menjumlahkan 2 buah angka

Step 1: Start

Step 2: Declare variables num1, num2 and sum.

Step 3: Read values num1 and num2.

Step 4: Add num1 and num2 and assign the result to sum. sum←num1+num2

Step 5: Display sum

Step 6: Stop

**2**.Instruct someone to add up a list of prices on a pocket calculator

turn on calculator

clear calculator

repeat the following instructions

key in dollar amount

key in decimal point (.)

key in cents amount

press addition (+) key

until all prices have been entered

write down total price

turn off calculator

3. Six basic computer operations

1. A computer can receive information (get input component / to receive information or input from a particular source.The verbs Read and Get are used in pseudocode to receive information or input from a particular source)
2. A computer can put out information (display output component / to supply information or output to a device. The verbs Print, Write, Put, Output or Display are used in the pseudocode to supply information or output to a device)
3. A computer can perform arithmetic (processing component / compute and calculate with (+) for add;(-) for subtract; (\*) for multiply; (/) for divide; () for parentheses)
4. A computer can assign a value to a variable or memory location (processing/storing the value of a component / To assign a value as a result of some processing, the symbols ‘=‘ or ‘🡨 ‘ are written, To keep a variable for later use, the verb Save or Store are used)
5. A computer can compare two variables and select one of two alternative actions (processing conditional component / The comparison data is established in the IF clause, and the choice of alternatives is determined by the THEN or ELSE options. Only one of these alternatives will be performed
6. A computer can repeat a group of actions (they process the repetition of a component / When there is a sequence of processing steps that need to be repeated, two special keywords , DOWHILE and ENDDO are used.)

4. 3 basic control structures :

1. Sequence : is the straightforward execution of one processing step after another
2. Selection : is the presentation of a condition and the choice between two actions, the choice depending on whether the condition is true or false
3. Repetition : is the presentation of a set of instructions to be performed repeatedly.

**EXCERSISE 2**

1. You require an algorithm that will receive two integer items from a terminal operator, and display to the screen their sum, difference, product and quotient.

A. Defining Diagram

|  |  |  |
| --- | --- | --- |
| Input | Processing | Output |
| Number1 | Prompt operator for Number1 and Number2 | Sum |
| Number2 | Get Number1 and Number2 | Difference |
|  | Add/sum Number1 and Number2 | Product |
|  | Substract Number1 and Number2 | Quotient |
|  | Multiply Number1 and Number2 |  |
|  | Divide Number1 and Number2 |  |
|  | Print/Display Output |  |

B. Solution

Operate Number1 and Number2

Prompt operator for Number1 and Number2

Get Number1 and Number2

Add/sum = Number1 + Number2

Substract = Number1 - Number2

Multiply = Number1 \* Number2

Divide = Number1/Number2

Print Output(Sum) to screen

Print Output(Difference) to screen

Print Output(Product) to screen

Print Output(Quotient) to screen

END

C. Desk Checking

|  |  |  |
| --- | --- | --- |
|  | First Data Set | Second Data Set |
| Number1 | 10 | 8 |
| Number2 | 5 | 2 |

Expected Result

|  |  |  |
| --- | --- | --- |
|  | First Data Set | Second Data Set |
| Sum | 15 | 10 |
| Difference | 5 | 6 |
| Product | 50 | 16 |
| Qoutient | 2 | 4 |

IV.Table of variable

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Statement number | Number1 | Number2 | Sum | Difference | Product | Quotient |
| First Data Set | | | | | | |
| 1,2 | 10 | 5 |  |  |  |  |
| 3 |  |  | 15 |  |  |  |
| 4 |  |  |  | 5 |  |  |
| 5 |  |  |  |  | 50 |  |
| 6 |  |  |  |  |  | 2 |
| 7 |  |  | Output |  |  |  |
| 8 |  |  |  | Output |  |  |
| 9 |  |  |  |  | Output |  |
| 10 |  |  |  |  |  | Output |
| Second Data Set | | | | | | |
| 1,2 | 8 | 2 |  |  |  |  |
| 3 |  |  | 10 |  |  |  |
| 4 |  |  |  | 6 |  |  |
| 5 |  |  |  |  | 16 |  |
| 6 |  |  |  |  |  | 4 |
| 7 |  |  | Output |  |  |  |
| 8 |  |  |  | Output |  |  |
| 9 |  |  |  |  | Output |  |
| 10 |  |  |  |  |  | Output |

2.You require an algorithm that will read in a tax rate (as a percentage) and the prices of five items. The program is to calculate the total price of the items before tax and then the tax payable on those items. The tax payable is calculated by applying the tax rate percentage to the total price. Print the total price and the tax payable as output.

I.Defining Diagram

|  |  |  |
| --- | --- | --- |
| Input | Processing | Output |
| Tax Rate | Read five item prices | Total Price |
| Item 1 | Calculate five items | Tax PayableSolution |
| Item 2 | Calculate tax on five items |  |
| Item 3 | Print total price |  |
| Item 4 | Print tax payable |  |
| Item 5 |  |  |

II.Solution Algorithm

Calculate\_TotalPrice

Read Tax rate, Item1, Item2, Item3, Item4, Item5

Total Price= Item1 + Item2 + Item3 + Item4 + Item5

Total Tax = Total Price \* Tax Rate (%)

Print Total Price

Print Tax payable

END

III.Desk Checking

|  |  |  |
| --- | --- | --- |
|  | First Data Set | Second Data Set |
| Tax Rate | 0.10 | 0.08 |
| Item 1 | 5000 | 10000 |
| Item 2 | 4000 | 8000 |
| Item 3 | 6000 | 7000 |
| Item 4 | 3000 | 9000 |
| Item 5 | 7000 | 6000 |

Expected result

|  |  |  |
| --- | --- | --- |
|  | First Data Set | Second Data Set |
| Total Price | 25000 | 40000 |
| Tax Payable | 2500 | 3200 |

IV.Table of variable

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Statement number | Item 1 | Item 2 | Item 3 | Item 4 | Item 5 | Tax Rate | Total Price | Tax Payable |
| First Data Set | | | | | | | | |
| 1 | 5000 | 4000 | 6000 | 3000 | 7000 | 0.10 |  |  |
| 2 |  |  |  |  |  |  | 25000 |  |
| 3 |  |  |  |  |  |  |  | 2500 |
| 4 |  |  |  |  |  |  | Output |  |
| 5 |  |  |  |  |  |  |  | Output |
| Second Data Set | | | | | | | | |
| 1 | 10000 | 8000 | 7000 | 9000 | 6000 | 0.08 |  |  |
| 2 |  |  |  |  |  |  | 40000 |  |
| 3 |  |  |  |  |  |  |  | 3200 |
| 4 |  |  |  |  |  |  | Output |  |
| 5 |  |  |  |  |  |  |  | Output |