



UNIVERSITAS ISLAM INDONESIA
FAKULTAS MIPA
Jl. Kaliurang Km. 14,5 Jogjakarta

ODD MIDTERM EXAM ACADEMIC YEAR 2020/2021

Course Name : Programming Algorithms
Study Program/Class : Statistics/a,b,c,d
Day/Date : Wednesday/November 11, 2020
Duration : 100 minutes
Lecture : Rahmadi Yotenka, S,Si., M.Sc
Exam type : Open All (Plagiarism of Friends' Answers = 0)
Online Media Used : Google Classroom

LO : Mastering the concepts of probability theory and statistics, mathematics, calculus, elementary linear algebra, statistical analysis methods, and elementary computer programming

Question number : 1,2 [Score: 100]

CO:

- Students are able to explain the concept of algorithms, presentation of algorithms and the basic structure of algorithms.
- Students are able to explain programming language in R, data structures and operators in R, and stages of programming in R.
- Students are able to apply the concept of function programs for sequential and branching structures.

Indicators:

- Students are able to present programming algorithms in the form of writing and pictures of mathematical and statistical problems.
- Students are able to apply object modes, arithmetic operators, and basic statistical functions in the R program.
- Students are able to create vector data, matrix data, data frames, and data lists in the R program.
- Students are able to program functions for sequential structures in R.
- Students are able to program functions for branching structures in R.

Instructions/material questions: Basic Concepts of Algorithms and programming; Program Function Sequential Structure and Branching

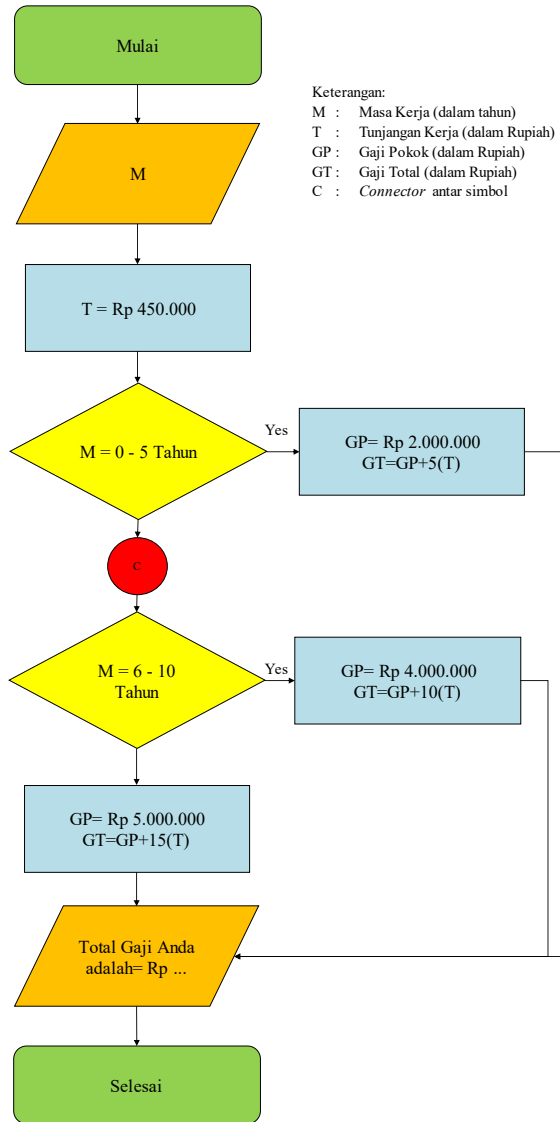
- 1) Data on Provincial Minimum Wage in DI Yogyakarta and Open Unemployment Rate (Percent) in 2017 – 2019.

District/City	Minimum Wage in DI Yogyakarta (Rupiah)			District/City Open Unemployment Rate (Percent)		
	2017	2018	2019	2017	2018	2019
Kulonprogo	1373600	1493250	1613200	1,99	1,49	1,80
Bantul	1404760	1572150	1649800	3,12	2,72	3,06
Gunungkidul	1337650	1454200	1571000	1,65	2,07	1,92
Sleman	1448385	1574550	1701000	3,51	4,40	3,93
Yogyakarta	1572200	1709150	1848400	5,08	6,22	4,80

(source: Central Bureau of Statistics, 2020)

Based on the data, make:

- a) 1 Vector which contains data on the minimum wage of DI Yogyakarta province and the open unemployment rate of DI Yogyakarta province in Bantul until 2019, 1 Vector which contains Regency/City data in DI Yogyakarta province in 2017, and 1 Vector which contains open unemployment rate in Yogyakarta in 2017 – 2019 respectively. Then each Vector does a check mode and class. (syntax and output are written on the answer sheet without being screenshot)
 - b) 1 Data frame containing data on districts/cities in the province of DI Yogyakarta and the annual open unemployment rate in the province of DI Yogyakarta. (syntax and output are written on the answer sheet without being screenshot)
 - c) Matrix A which contains data on the minimum wage of DI Yogyakarta province in Kulonprogo, Bantul, and Gunungkidul regencies each year in a row according to Table and Matrix B which contains data on the open unemployment rate of DI Yogyakarta province in Kulonprogo, Bantul and Gunungkidul regencies in 2017 respectively - in succession. With the provision of writing syntax programs using $\text{byrow} = \text{Q}$. Do multiplying matrix A by matrix B with the object name MatrixC. Then transpose Matrix C. (syntax and output are written on the answer sheet without being screenshot)
 - d) 1 List containing data that has been created in numbers a), b), and c). (syntax and output are written on the answer sheet without being screenshot)
- 2) Make a Program Function to calculate the total salary of employees at PT Z based on the period of service of each employee using the formula: $\text{Total Salary} = \text{Basic Salary} + \text{Years of Service} \times \text{Work Allowances}$. The program created must match or follow the algorithm presented in the form of the Flowchart following. (syntax and output are written on the answer sheet without being screenshot)



The verification of Midterm Exam, Odd Academic Year 2020/2021				
The suitability of the problems with CO	The Completeness of the problems information	Verifier	Verification date	Sign
Suitable/ Less suitable / Not Suitable	Complete/ Less Complete / Not Complete	Science cluster coordinator	6-Nov-2020	