Basic Programming Practicum
Jobsheet 2

Name

Dicha Zelianivan Arkana

NIM

2241720002

Class

1i

Department

Information Technology

Study Program

D-IV Informatics Engineering

1 Practice

1.1 Experiment 1: Complete a Case Study On Sequence

Questions

1. Mention sequentially what you do after college like experiment 1 question-1!

   - Pack my belongings like laptop, charger, etc.
   - Get out of the classroom
   - Go to the elevator or walk down the stairs
   - Walk to the boarding house
   - After arriving, take of my shoes, change my shirt, take a shower if it's already late

2. Rewrite and complete the algorithm in Experiment 1 No. 2!

   - From the start the frog jumps in the 0 direction
   - Then jump again in the 0 direction
   - Then the frog turns to the lilly pad in the 6 direction
   - After turning, the frog jumps 3 times
   - Then the frog turns to the lilly pad in the 4 direction
   - After turning, the frog jumps twice
   - After that, the frog turns to the lilly pad in the 2 direction
   - Then the frog jumps twice
   - After jumping twice, the frog turns to the 4 direction
   - After that, the frog jumps twice again
   - Finally, the frog turns to the lilly pad in the 1 direction and jumps once

3. Calculate mathematically the results of experiment 1 problem 3! What is the result?

Input   : Periphery of Mr Ahmad's land, which is 64m
Output   : Land Area
Other Data : -
Process   :

- Enter the circumference of the land

- Calculate the length of sides from Mr Ahmad's land.

$$side = perimeter \div 4 \rightarrow 64 \div 4 = \mathbf{16}$$

- Calculate area.

$$side \times side \rightarrow 16 \times 16 = \mathbf{256}$$

- Pak ahmad's land area as an output.

4. If there is additional information as follows "Mr. Ahmad wants to plant a circular rose in the middle of his land. Pak Ahmad wants to maximize his land so that as much as possible there are only a few vacant lands. What is the area of Mr. Ahmad's land planted with Mawar flowers? " Rewrite the steps for making the correct algorithm!

Input   : Mr Ahmad's land area, which is $256m^2$
Output   : Land Area planted with Mawar flowers in circular shape
Other Data : -
Process   :

- Enter the area of the land

- Calculate the area of circular shape inside Mr Ahmad's land. We can use $\frac{1}{2} \times 16 = 8$ as the circle's radius

- Calculate area.
$$\pi r^2 = 3.14 \times 8^2 = \mathbf{201}$$

- Pak ahmad's flower area, which is $\mathbf{201}m^2$

5. After additional data about question 4, what is the area of Mr. Ahmad's land that is not planted with roses?

Input : Mr Ahmad's land area, which is $256m^2$, and flower area, $201m^2$
Output : Land Area that is not planted with Mawar flowers
Other Data : -
Process :

- Enter the area of the land
- Calculate the leftover area.

$$land\ area - flower\ area = 256 - 201 = \mathbf{55}m^2$$

- Pak ahmad's land area that is not planted with flower, which is $\mathbf{55}m^2$

1.2 Experiment 2: Complete a Case Study About Selection

Questions

1. Rewrite and complete the algorithm in experiment 2! (see next page)

Input   : River, River connectivity information (For example, A is adjacent to B and D)

Output   : Path of the entire river

Other Data : -

Process   :

- Beaver is in the middle of several river meetings. He can swim from the river B / D / E / F / G

- If starting from **B** then the track that can be traversed by choosing river A or C. If it crosses river A, then:

  - River A continues to river D
  - From D has the option to E / F / G river. If you choose F or G then it is possibility that one river must be crossed more than once. Then the river E was chosen
  - From E, proceed to the connected and have same direction river, river H
  - From the river H continued to the river that is connected and have same direction, there are **F-G-C**
  - So the path Beaver goes through is **B-C-G-F-H-E-D-A** (output)

  If it crosses river C, then:

  - River C continues to river G
  - There are three other path, which is B, D, and E, but those are not what we want because it will make the beaver go the same river twice later on. So we choose to go to **F-H-E**
  - Then the only path left is **D-A**
  - So the path Beaver goes through is **A-D-E-H-F-G-C**

- If it starts from D then the track that can be traversed by choosing river A.

  - From river A, there are 2 choices, B and C. Let's choose the path from C, which makes the beaver go through **C-G**
  - Now, there are several choices (B / E / F). We can't choose B because we'll be going through the same river twice. We'll choose F because choosing it will make the entire path simpler.
  - After choosing F, we'll go through **F-H-E**
  - The only river left is B, so choose that.
  - So the path Beaver goes through is **B-E-H-F-G-C-A**

:

- If it starts from E then the track that can be traversed by choosing river H.
  - From river H, the only option is to go through F
  - There are several options that we can go from river F (D / B / G), choose river G just because it's the next letter after F.
  - After choosing G, we can go through **G-C**
  - Now, we have two options, A and B. Choose B.
  - After we go to B, there is only one path left, which is **D-A**
  - So the path Beaver goes through is **A-D-B-C-G-F-H-E**

- If it starts from F then the track that can be traversed by choosing river H.
  - From river H, we can go through **H-E**
  - There are several options that we can choose (D / B / G). Choose D just because it's the letter that comes before E
  - After choosing D, we can then go to A
  - Here, we can choose between B and C. We can choose B just because it's the letter that comes after A
  - There is only one path left, which is **G-C**
  - So the path Beaver goes through is **C-G-B-A-D-E-H-F**

- If it starts from G then the track that can be traversed by choosing river C.
  - After arriving at river C, we can choose between A and B. Choose **A-D**
  - Now, We have several options (B / E / F), choose F because it's a straight path.
  - We can then go through **F-H-E**
  - There's only one path left, which is B
  - So the path Beaver goes through is **B-E-H-F-D-A-C-G**

2. Write the algorithm of the regulation SP1, SP2, and SP3 at JTI Polinema as you know!

   This answer assumes that the student have 20 hours of alpha

   Input   : Student's alpha total, which is 20 hours
   Output   : What type of SP the student will get
   Other Data : -
   Process   :

   - Check the student's alpha total
   - If it's >= 18 hours, then the student will get SP1
   - If it's >= 36 hours, then the student will get SP2
   - If it's >= 47 hours, then the student will get SP3
   - Otherwise, the student won't get anything
   - Since the student has 20 hours of alpha, the student will get SP1

1.3 Experiment 3: Complete a Case Study About Repetition

Questions

1. Mention the position that was detected wrongly in experiment 3 questions 2!
   The beaver that sits at the wrong place is the beaver at `[3,4]` because that beaver should be sitting at `[4,3]`

2. Mention 5 activities that use the concept of repetition / looping that you have encountered!

   (a) Doing the laundry
   (b) Rinsing rice
   (c) Washing the dishes
   (d) Coding
   (e) Designing
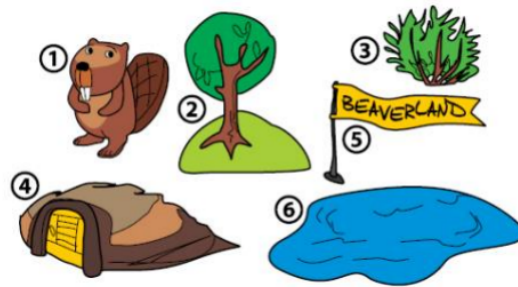
2 Assignment

Figure 1: The painting that Lina wanted

Figure 2: The painting that Lina wanted

1. Create an algorithm to get a painting like the one above (shown by figure 2)!

   Input   : Stamps as shown on figure 1
   Output   : Painting as shown on figure 2
   Other Data : -
   Process   :

   - Use *the pond* (6) as the first layer because it has the most cut-off part
   - The next layer would be *the island with a tree* (2)
   - The third layer is *the beaverland flag* (5)
   - The next layer is going to be *the beaver house* (4)
   - Add *the bush* (3) as the fourth layer
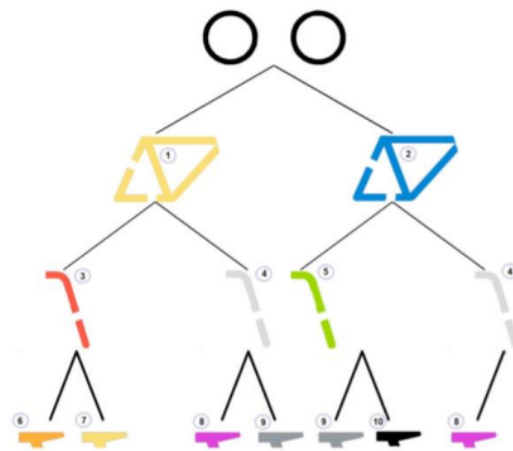   - Finally, add *the beaver* (1) as the top-most layer
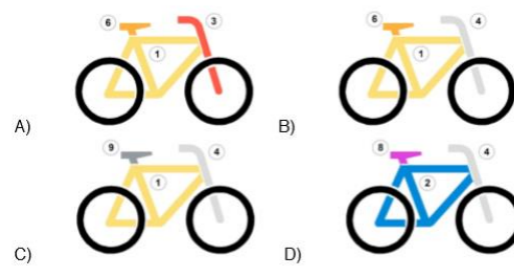
Figure 3: Bicycle color rule

Figure 4: Bicycle results

2. In accordance with the above rules, which of the following bikes (shown by figure 4) is unsuitable?

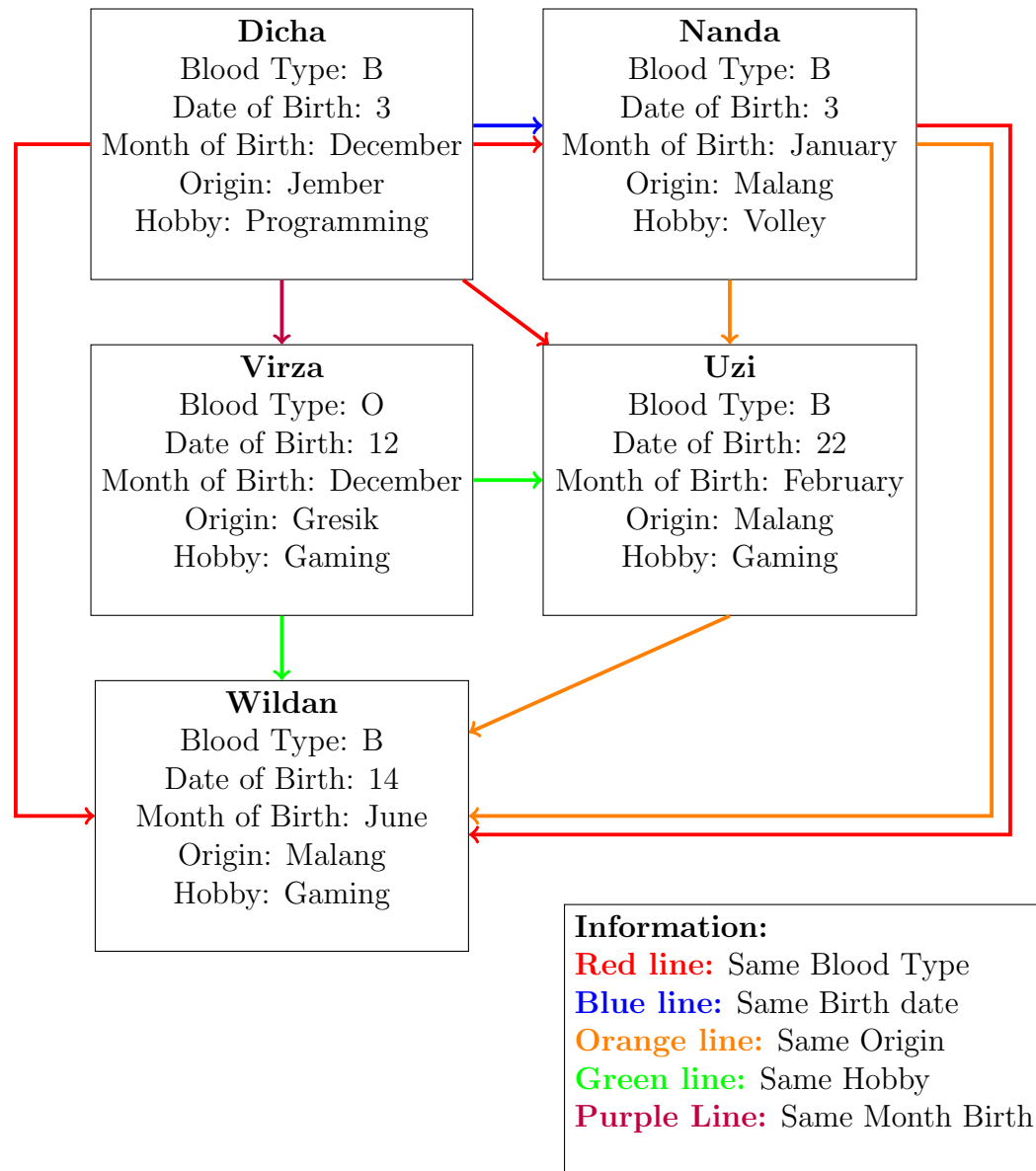**Input**   : Bicycle color rule as (shown on figure 3), Bicycle result to choose from (shown on figure 4)

Output   : Unsuitable combination

Other Data : -

Process   :

- Check the first part, every bicycle can have a pair of tire. Every bicycle have a pair of tire.

- Next step is to check the bicycle body, which is yellow and blue. Every bicycle have a correct body part.

- After choosing the body, choose the handle. Every bicycle has the correct handle according to the rule.

- Some bicycle with specific handle can only choose specific saddle. If we check the bicycles, we can see that the bicycle (**B**) uses an incorrect saddle. It can only choose between pink or grey if it has a white handle but it uses a yellow saddle.

3. Do interviews with students in the same class (choose 5-10 students) as you! Record information about nickname, blood group, date of birth, month of birth, hometown, and hobby. Present the information in a network:

Dicha
Blood Type: B
Date of Birth: 3
Month of Birth: December
Origin: Jember
Hobby: Programming

Nanda
Blood Type: B
Date of Birth: 3
Month of Birth: January
Origin: Malang
Hobby: Volley

Virza
Blood Type: O
Date of Birth: 12
Month of Birth: December
Origin: Gresik
Hobby: Gaming

Uzi
Blood Type: B
Date of Birth: 22
Month of Birth: February
Origin: Malang
Hobby: Gaming

Wildan
Blood Type: B
Date of Birth: 14
Month of Birth: June
Origin: Malang
Hobby: Gaming

Information:
Red line: Same Blood Type
Blue line: Same Birth date
Orange line: Same Origin
Green line: Same Hobby
Purple Line: Same Month Birth

Then answer the following questions

(a) Who has the same blood type as you?
- Nanda
- Uzi
- Wildan

(b) Who were born in the same month as you?
- Virza

(c) Who was born on the same date as you?
- Nanda

(d) Who are from the same area as you?
- -

(e) Who has the same hobby as you?
- -

4. A laundry service "Smile Laundry" has a fee rule like this one

- The fare for every 1 kg of clothing is Rp. 4,500
- If the customer washes clothes more than 10 kg, the customer will get a 5% discount

Today, Laundry only has 4 customers, namely Ani, Budi, Bina, and Cita. Ani brought 4kg of clothes, Budi brought 15kg of clothes, Bina brought 2kg, and finally Cita brought 11kg. What did Smile Laundry think that day? Create the Algorithm!

Input	: Laundry price/kg, Ani clothes (4kg), Budi clothes (15kg), Bina clothes (2kg), and Cita clothes (11kg)
Output	: The total price
Other Data	: 5% discount every $> 10kg$
Process	:

- Calculate each prices using multiplication. If amount $> 10kg$ then apply the discount

$$Ani = 4 \times 4500 \qquad\qquad\qquad =\textbf{Rp.18.000,-} \tag{1}$$

$$Budi = 15 \times 4500 - (5\%) = 67500 - 3375 \quad =\textbf{Rp.64.125,-} \tag{2}$$

$$Bina = 2 \times 4500 \qquad\qquad\qquad =\textbf{Rp.9.000,-} \tag{3}$$

$$Cita = 11 \times 45000 - (5\%) = 49500 - 2475 \quad =\textbf{Rp.47.025,-} \tag{4}$$

- Sum the prices

$$18000 + 64125 + 9000 + 47025 = \textbf{Rp.138.150,-} \tag{5}$$

So the total price is **Rp.138.150,-**