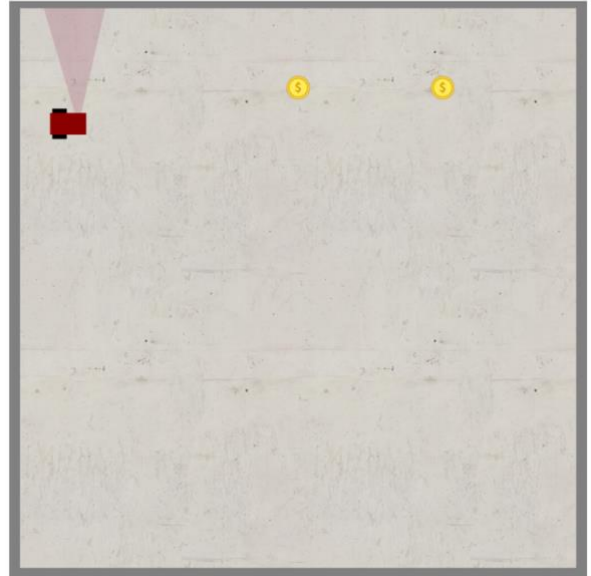# Engineering Physics Lab 3 Pseudocode Homework 1

Task: The coins are around 110 cm away from the top wall. Use the data from the ultrasonic sensor to navigate the robot to collect both coins.

https://englab.dawsoncollege.qc.ca/robot/3-%20Follow%20The%20Wall.html

1. Write a pseudocode solution to the task. (Examples of pseudocode are given below).

2. How does my pseudocode reflect a sequence of steps that completes the task? Describe in plain language your overall strategy for completing the task.

Pseudocode Practice Problems

Listed below is a brief explanation of pseudocode as well as a list of examples and solutions. Pseudo code uses a text-based approach to creating a sequence of steps that complete a task and can be used for planning a code-based solution.

Pseudocode

Pseudocode can be broken down into five main components.
- Variables
- Assignment
- Input/output
- Selection
- Repetition

A **variable** has a name, a data type, and a value. It is considered good practice to use variable names that are relevant to the task at hand.

Assignment is the physical act of placing a value into a variable. Examples:

set = 5;
set = num + set;

The left side is the variable a value is being stored in, and the right side is where the variable is being accessed. When a variable is assigned a value, the old value is written over with the new value so the old value is gone.

For instance, x = 5 does not mean that x is equal to 5. It means set the variable x to have the value 5.

Input/Output both deal with an outside source (can be a user or another program) receiving or giving information. An example would be assuming a fast food restaurant is a program. A driver (user) would submit their order for a burger and fries (input), they would then drive to the side window and pick up their ordered meal (output.)
- Output – Write / display / print
- Input – Read / get / input

Selection allows for a choice between performing an action and skipping it. These are conditional statements.

if (conditional statement)
    statement list
else
    statement list

Repetition (looping) is a construct that allows instructions to be executed multiple times.

```
while (conditional statement)
    statement list
```

Examples

Example 1: Write pseudocode that reads two numbers and multiplies them together and print out their product.

```
Read num1 , num2
    Set multi  to  num1*num2
Write multi
```

Example 2: Write pseudocode that tells a user that the number they entered is not a 5 or a 6.

Solution 1:

```
Read isfive
If ( isfive == 5)
   Print "your number is 5"
Else if (isfive == 6)
    Print "your number is 6"
Else
    Print "your number is not 5 or 6"
```

Solution 2:

```
Read isfive
If (isfive = 5 or isfive = 6)
    Print "your number is a 5 or 6"
Else
    Print "your number is not 5 or 6"
```

Solution 3:

Read isfive
If(isfive is not 5 and isfive is not 6)
        Print "your number is not 5 or 6"

Example 3: Write pseudocode that performs the following.

Ask a user to enter a number. If the number is between 0 and 10, Print the word blue; if the number is between 10 and 20, Print the word red; if the number is between 20 and 30, Print the word green; if it is any other number, Print that it is not a correct color option.

Print "Please enter a number"

Read colornum
If (colornum >0 and colornum <= 10)
    Print blue
else If (colornum >0 and colornum <= 10)
    Print blue
else If (colornum >0 and colornum <= 10)
    Print blue
else
    Print "not a correct color option"

Example 4: Write pseudo code to print all multiples of 5 between 1 and 100 (including both 1 and 100).

Set x to 1
While(x < 20)
   Print x
   x = x*5

Example 5: Write pseudo code that will count all the even numbers up to a user defined stopping point. For example, say we want to see the first 5 even numbers starting from 0. well, we know that evens numbers are 0, 2, 4, etc.

The first 5 even numbers are 0, 2, 4, 6, 8.
The first 8 even numbers are 0, 2, 4, 6, 8 ,10 ,12, 16

Read count Set x to 0;
While (x < count)
   Set even to even + 2
   x = x + 1
   Print even

Example 6: Write pseudo code that will perform the following.
  a) Read in 5 separate numbers.
  b) Calculate the average of the five numbers.
  c) Find the smallest (minimum) and largest (maximum) of the five entered numbers.
  d) Print out the results found from steps b and c with a message describing what they are.

```
Print "please enter 5 numbers one at a time"
Read n1
Set max to n1
Set min to n1
Set sum to n1

For i in (1,2,3,4)
        Read num
        if( num > max)
                set max to num
        if(num < min)
                set min to num
        add num to sum

Print "The average is: "
Print sum/5
Print "The min is: "
Print min
Print "The max is: "
Print max
```