

Pseudo Code Practice Problems:

Listed below is a brief explanation of Pseudo code as well as a list of examples and solutions.

Pseudo code

Pseudo code can be broken down into five components.

- Variables:
- Assignment:
- Input/output:
- Selection:
- Repetition:

A variable has a name, a data type, and a value. There is a location in memory associated with each variable. A variable can be called anything or be given any name. 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. Assignment can be shown using

```
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. $x = 5$ does not mean that x is equal to 5; it means set the variable x to have the value 5. Give x the value 5, make x equal to 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 construct allows for a choice between performing an action and skipping it. It is our conditional statements. Selection statements are written as such:

```
if ( conditional statement)  
    statement list  
else  
    statement list
```

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

```
In a repetition problem  
– Count is initialized  
– Tested  
– incremented
```

Repetition problems are shown as:

```
while ( condition statement)  
    statement list
```

Examples

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

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

Example 3: Write pseudo code that performs the following: Ask a user to enter a number. If the number is between 0 and 10, write the word blue. If the number is between 10 and 20, write the word red. If the number is between 20 and 30, write the word green. If it is any other number, write that it is 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).

Example 5: Write pseudo code that will count all the even numbers up to a user defined stopping point.

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) Write out the results found from steps b and c with a message describing what they are

Homework 1: Write pseudo code that reads in three numbers and writes them all in sorted order.

Homework 2: Write pseudo code that will calculate a running sum. A user will enter numbers that will be added to the sum and when a negative number is encountered, stop adding numbers and write out the final result.

Solutions

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

Pseudo code	Ch code
Read num1 , num2 Set multi to num1*num2 Write multi	int num1, num2, multi; cin>>num1>>num2; multi = num1 * num2; cout<<multi<<endl;

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

Example 2 Solution 1:

Pseudo Code:	CH code:
Read isfive If(isfive = 5) Write "your number is 5" Else if (isfive = 6) Write "your number is 6" Else Write "your number is not 5 or 6"	int isfive; cin>> isfive; if(isfive == 5) { cout<<"your number is 5"; } else if(isfive == 6) { cout<<"your number is 6"; } else { cout<<"your number is not 5 or 6"; }

Example 2 Solution 2:

Pseudo Code:	CH code:
Read isfive If(isfive = 5 or isfive = 6) Write "your number is a 5 or 6" Else Write "your number is not 5 or 6"	int isfive; cin>> isfive; if(isfive == 5 isfive == 6) { cout<<"your number is 5 or 6"; } else { cout<<"your number is not 5 or 6"; }

Example 2 Solution 3:

Pseudo Code:	CH code:
Read isfive If(isfive is not 5 and isfive is not 6) Write "your number is not 5 or 6"	int isfive; cin>> isfive; if(isfive != 5 && isfive != 6) { cout<<"your number is not 5 or 6"; }

Example 3: Write pseudo code that performs the following: Ask a user to enter a number. If the number is between 0 and 10, write the word blue. If the number is between 10 and 20, write the word red. if the number is between 20 and 30, write the word green. If it is any other number, write that it is not a correct color option.

Pseudo Code:	CH code:
Write "Please enter a number" Read colornum If (colornum >0 and colornum <= 10) Write blue else If (colornum >0 and colornum <= 10) Write blue else If (colornum >0 and colornum <= 10) Write blue else Write "not a correct color option"	int colornum; cout<<"Please enter a number" cin>> colornum; if(colornum > 0 && colornum <= 10) { cout<<"blue"; } else if(colornum > 0 && colornum <= 10) { cout<<"blue"; } else if(colornum > 0 && colornum <= 10) { cout<<"blue"; } else { cout<<"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).

Pseudo Code:	CH code:
Set x to 1 While(x < 20) write x x = x*5	int x = 1; cin>>x; while(x < 20) { cout<<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

Example 5 solution 1:

<p>Pseudo Code:</p> <p>Read count Set x to 0; While(x < count) Set even to even + 2 x = x + 1 write even</p>	<p>CH code:</p> <pre>int x, count, even; x = 0; even = 0; cin>>count; while(x < count) { cout<<even; even = even+2; x = x+1; }</pre>
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Example 5 solution 2:

<p>Pseudo Code:</p> <p>Read count Set x to 0; While(x < count) Set even to even + 2 x = x + 1 write even</p>	<p>CH code:</p> <pre>int x, count, even; cout<<"0"; x = 1; cin>>count; while(x < count) { cout<<x*2; x = x+1; }</pre>
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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) Write out the results found from steps b and c with a message describing what they are.

Pseudo Code:	CH code:
Write "please enter 5 numbers" Read n1,n2,n3,n4,n5 Write "The average is" Set avg to $(n1+n2+n3+n4+n5)/5$ Write avg If(n1 < n2) Set max to n2 Else Set max to n1 If(n3 > max) Set max to n3 If(n4 > max) Set max to n4 If(n5 > max) Set max to n5 Write "The max is" Write max If(n1 > n2) Set min to n2 Else Set min to n1 If(n3 < min) Set min to n3 If(n4 < min) Set min to n4 If(n5 < min) Set min to n5 Write "The min is" Write min	cout<<"please enter 5 numbers"; int n1,n2,n3,n4,n5; cin>>n1>>n2>>n3>>n4>>n5; int avg = (n1+n2+n3+n4+n5)/5; cout<<"The average is "<<avg; int min, max; if(n1<n2) max=n2; else max=n1; if(n3>max) max=n3; if(n4>max) max=n4; if(n5>max) max=n5; cout<<"The max is "<<max; if(n1>n2) min=n2; else min=n1; if(n3<min) min=n3; if(n4<min) min=n4; if(n5<min) min=n5; cout<<"The min is "<<min;

Homework 1: Write pseudo code that reads in three numbers and writes them all in sorted order.

Homework 1 solution 1:

<p>Pseudo Code:</p> <pre>Read num1, num2, num3 If (num1 < num2) If(num2 < num3) Write num1 , num2, num3 Else If(num3 < num1) Write num3, num1, num2 Else Write num1, num3, num2 else If(num1 < num3) Write num2 , num1, num3 Else If(num3 < num2) Write num3, num2, num1 Else Write num2, num3, num1</pre>	<p>CH code:</p> <pre>int num1, num2, num3; cin>> num1>>num2>>num3; if (num1 < num2) { if(num2 < num3) { Cout<< num1<<" "<<num2<<" "<<num3; } else { if(num3 < num1) { Cout<< num3<<" "<<num2<<" "<<num2; } else { Cout<< num1<<" "<<num3<<" "<<num2; } } } else { If(num1 < num3) { Cout<< num2<<" "<<num1<<" "<<num3; } else { If(num3 < num2) { Cout<< num3<<" "<<num2<<" "<<num1; } else { Cout<< num2<<" "<<num3<<" "<<num1; } } }</pre>
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Homework 1 solution 2:

<p>Pseudo Code:</p> <pre>Read num1, num2, num3 If (num1 < num2 < num3) Write num1 , num2, num3 else If (num1 < num3 < num2) Write num1 , num2, num3 else If (num2 < num1 < num3) Write num2 , num1, num3 else If (num2 < num3 < num1) Write num2 , num3, num1 else If (num3 < num1 < num2) Write num3 , num1, num2 else If (num3 < num2 < num1) Write num3 , num2, num1</pre>	<p>CH code:</p> <pre>int num1, num2; cin>> num1>>num2>>num3; if(num1 < num2 && num2 < num3 && num1 < num3) { cout<<num1<<" "<<num2<<" "<<num3; } else if(num1 < num2 && num2 > num3 && num1 < num3) { cout<<num1<<" "<<num3<<" "<<num2; } else if(num1 > num2 && num2 < num3 && num1 < num3) { cout<<num2<<" "<<num1<<" "<<num3; } else if(num1 > num2 && num2 < num3 && num1 > num3) { cout<<num2<<" "<<num3<<" "<<num1; } else if(num1 < num2 && num2 > num3 && num1 > num3) { cout<<num3<<" "<<num1<<" "<<num2; } else if(num1 > num2 && num2 > num3 && num1 > num3) { cout<<num3<<" "<<num2<<" "<<num1; }</pre>
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Homework 2: Write pseudo code that will calculate a running sum. A user will enter numbers that will be added to the sum and when a negative number is encountered, stop adding numbers and write out the final result.

Pseudo Code:

```
Read x
Set sum to 0;
While(x >= 0)
  Set sum to x + sum
  Read x
```

CH code:

```
int x, sum;
sum = 0;
cin>>x;
while(x >= 0)
{ sum = sum + x
  cin>>x;
}
```