Unit 4 Variables Practice Problems / 28 C / 28 K /28 T /28 A

Timeline: 1 class

Definition: Variable is a named location in memory. A variable stores a value (or user input) for later use in a computer program.

The input is stored according to the type of data.

Text is stored as String eg. String name;

Single characters are stored as char eg. char answer;

The variable name should be a full word that reflects to what is being stored. For example: to store triangle area the variable should be triangleArea or for length of a rectangle should be rectLength. The variable type should reflect the kind of numeric value being stored – double for values with decimals (eg. 45.9 or 10/3) or integers for whole numbers (eg. -24 or 149)..

To create a variable in Processing you write the data type followed by the name of the variable, then a ; (semi-colon). For example

```
int total;
real number;
```

Example Problem

Write a program that will calculate the square of a number. Assume that the initial value (number) will be an integer and your program will calculate the square of the input. The program needs 2 variables: 1 to store the initial value and 1 to store the calculation result. Remember to organize your program into procedures.

	Type	Name of Variable	Declaration Statement	Processing
initial variable	int	number	int number;	square = number * number;
output variable	int	square	int square;	

Name:_____

Following the example on page 1, work in pairs and fill in the blanks for each problem. Each student will hand in their answers separately!. You may use your student agenda book for the formulas! Use variable names that reflect what they are storing - no single letters!

1. Write a program that will calculate the cube of a number.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	number	int number;	
output variable	int	cube	int cube;	cube=number*number*number;

2. Write a program that will calculate the perimeter **of a room**.
assuming the room is a rectangle...

	Type	Name of Variables	Declaration Statement	Processing
input variables	int int	widthR lengthR	int widthR; int lengthR;	
output variable	int	perimeterR	int perimeterR;	perimeterR=2*(widthR+lengthR);

3. Write a program that will calculate the area of a room.
again assuming the room is a rectangle

	Type	Name of Variables	Declaration Statement	Processing
input variables	int int	widthR lengthR	int widthR; int lengthR;	
output variable	int	areaR	int areaR	areaR = widthR*lengthR

4. Write a program that will calculate the circumference of a circle.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	radius	int radius;	
output variable	double	circumference	double circumference;	circumference = 2*radius*PI

5. Write a program that will calculate the volume of a rectangular prism.

	Type	Name of Variables	Declaration Statement	Processing
input variables	int int int	widthRP lengthRP heightRP	int widthRP; int lengthRP; int heightRP;	
output variable	int	volumeRP	int volumeRP;	volumeRP=widthRP*lengthRP*heightRP

6. Write a program that will calculate the volume of a cone.

	Type	Name of Variables	Declaration Statement	Processing
input variables	int int	heightC radiusC	int heightC; int radiusC;	
output variable	double	volumeC	double volumeC;	volumeC=PI*radiusC*radiusC*heightC/3

7. Write a program that will calculate the HST on any given amount (13%).

	Type	Name of Variable	Declaration Statement	Processing

input variable	float
	float
	float
		cost
		HST
		cost1
			float cost;
			float HST = 1.13;
			float cost1 = round(cost*HST*100);	

output variable	float	tCost	float tCost	tCost = cost1/100;

8. Write a program that will calculate the GST on any given amount (8%).

	Type	Name of Variable	Declaration Statement	Processing

input variable	float
	float
	float
		cost
		GST
		cost1
			float cost;
			float GST = 1.08;
			float cost1 = round(cost*GST*100);	

output variable	float	tCost	float tCost;	tCost = cost1/100;

9. Write a program that will convert feet into meters.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	feet	int feet	
output variable	float	meters	float meters	meters = feet*0.3048

10. Write a program that will convert gallons into liters.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	gallons	int gallons;	
output variable	float	litres	float litres	litres = gallons*3.78541

11. Write a program that will convert Celsius to Fahrenheit.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	celsius	int celsius;	
output variable	float	fahrenheit	float fahrenheit;	fahrenheit=celcius*9/5+32

12. Write a program that will convert Fahrenheit to Celsius.

	Type	Name of Variable	Declaration Statement	Processing
input variable	int	fahrenheit	int fahrenheit;	
output variable	float	celcius	float celcius;	celcius=(fahrenheit-32)*5/9

13. Write a program that will calculate the surface area of a cone.

	Type	Name of Variable	Declaration Statement	Processing
input variables	int float	radius sHeight	int radius; float sHeight;	
output variable	float	sArea	float sArea;	sArea = radius*sHeight*PI

14. Write a program that will calculate the average of two test marks for any given test.

	Type	Name of Variable	Declaration Statement	Processing
input variables	float float	test1; test2;	float test1; float test2;	
output variable	float	average	float average;	average = (test1+test2)/2