**Problem Sheet VBA (Fall 2020)**

* To see the video, click on Video Clip

***Creating user-interface form and writing event procedures using sequence construct***

1. Create a user-interface form and name it as Payroll with a Caption Payroll.   
   Insert three Text Boxes in the form:  
   Names: (1) txtName (2) txtPayRate (3) txtHrsWorked  
   Insert three Labels in the form:  
   Names: (1) lblName (2) lblGrossPay (3) lblTotalGrossPay  
   BorderStyle: Single  
   Insert three Command Buttons in the form:  
   Names: (1) btnCalculate (2) btnClear (3) btnExit  
   Captions: Calculate Clear Exit  
   [Video Clip – Problem 1](https://mediaspace.minnstate.edu/media/1_iqobpqht)
2. Create an application using the user-interface form “Payroll” developed in Problem 1. Enter employee name, pay rate, and hours worked in the txtName, txtPayRate, and txtHrsWorked TextBoxes.  
   a) Write an event procedure to calculate gross pay and total gross pay; display employee name, gross pay, and total gross pay in the lblName, lblGrossPay, and lblTotalGrossPay Labels when the **btnCalculate button is clicked**.  
   b) Write an event procedure that clear values from all the Text Boxes, all Labels (except lblTotalGrossPay Label, and moves the cursor to txtName TextBox when the **btnClear button is clicked.**  
   c) Write an event procedure that closes the application when **btnExit button is clicked.**Test the application using the following 3 data sets:  
    Name Pay rate Hours Worked   
   i) John $25.50 20   
   ii) James $30.00 12  
   iii) Mary $45.00 10

Result: gross pay 510, 360, and 450 for (i), (ii), and (iii) respectively,   
 Total gross pay = 1,320  
[Video Clip – Problem 2](https://mediaspace.minnstate.edu/media/1_pwor2mxa)

1. Create a user interface form with two command buttons – button 1 and button 2. Click button 1 and button 2 multiple times. Display in labels the number of times button 1 is clicked, button 2 is clicked, and total number of clicks (button 1 clicks + button2 clicks).  
   [Video Clip – Problem 3](https://mediaspace.minnstate.edu/media/1_uwpgkjwh)

***Selection Construct (IF…THEN…ELSE)***

1. Use INPUTBOX function to get the age. If the age is <= 18, display "Person is Minor" otherwise display "The person is Adult”. Use the message box (MSGBOX) function to display the result.  
   [Video Clip – Problem 4](https://mediaspace.minnstate.edu/media/1_pl68fayj)
2. Use INPUTBOX functions to get the two integers and the type of arithmetical operation performed. For type of arithmetical operations - use A for Add, S for Subtract, M for Multiply, and D for Divide. Display the result in the message box (Hint: Use IF Then Else Clause)  
   [Video Clip – Problem 5](https://mediaspace.minnstate.edu/media/1_nlm4z6iq)
3. Determine whether a student’s classification is a FR, SO, JR, OR SR based on credit hours completed. FR 0-30, SO 31 - 60, JR 61 - 90, SR >90. Use INPUTBOX to get the credit hours completed. Use message box function to display the classification. (Hint: Use IF Then Clause).  
   [Video Clip – Problem 6](https://mediaspace.minnstate.edu/media/1_yccrcra1)

***Repetition Construct (DO…WHILE...LOOP and FOR...NEXT)***

1. Display the sum of odd numbers between 3 and 12 in a message box using a Do While loop.
2. Display the sum of odd numbers between 3 and 12 in a message box using a FOR NEXT loop.  
   [Video Clip – Problems 7 and 8](https://mediaspace.minnstate.edu/media/1_nswwsmjp)
3. Wages = Hours Worked \* Pay Rate.   
   Use the input box function for hours worked and pay rate. Display wages in the message box. Use a Do While Loop to calculate and display wages. The process ends when a terminating condition (negative value for hours worked) is entered. Display total wages in a message box after the process ends.  
   [Video Clip – Problem 9](https://mediaspace.minnstate.edu/media/1_d5kwmfpu)
4. Same as above (Prob. 9) except for the condition to enter and exit from the Do While loop. To continue, enter “Y” - to exit, enter “N” at the prompt “Do you wish to continue”. (Note: In No, 7, an input variable, Hours Worked, ends the Do While process. In No. 8, a separate variable, not part of the input variable, ends the Do While process).  
   [Video Clip – Problem 10](https://mediaspace.minnstate.edu/media/1_c5rcj6ev)

***Additional Problems***

1. Use INPUTBOX function to enter the amount of water used. Use message box function to display the total charge. Total Charge = Water Used \* Charge/gallon where charge per gallon is $.00175. The customer will pay the higher of $20 or calculated total charge.
2. Use INPUTBOX function to get the score and display the letter grade in the message box.   
   Score and letter grade:  
   A >= 90. B >=80 and < 90. C >= 70 and < 80. D >=60 and < 70. F < 60, (Hint: Use IF Then Else Clause)
3. Display the sum of first 6 (1, 2, 3 ,4, 5, and 6) consecutive integers using a FOR NEXT loop in a message box.
4. Display the sum of first 6 (1, 2, 3 ,4, 5, and 6) consecutive integers using a Do While loop in a message box.
5. The population of a certain town is 400,000 and growing at a rate of 5% or 0.05 per year? How much it is every year until it just crosses 500,000. How long before it just crosses 500,000.   
   Formula: Final population = Initial Population \* (1 + Growth Rate)^Year  
   Display the result in a message box? Use Do While Loop. Can you use a FOR NEXT loop for this problem? Why?
6. Create a Sub Procedure to find the value of individual items and total value of all items.   
   Value = Price \* Quantity. Use INPUTBOX functions to get the price and quantity. Display the result of value and total value in the message box. Test the Sub Procedure using the following data  
   1 Price = $20.50 Quantity = 30   
   2 Price = $25.75 Quantity = 40  
   3 Price = $35.50 Quantity = 50
7. Create a user-form application to add, multiply, and subtract two numbers. The user-form has two textboxes to enter the first and the second number, three command buttons to Add, Multiply and Subtract. Five labels – resultlabel display the result. Addlabel display number of additions. MultiplyLabel display number of multiplications, and SubtractLabel – number of subtractions. TotalLabel -number of additions, multiplications, and subtractions.

***Conceptual Questions:***

1. What is the purpose of Option Explicit?  
   [Video Clip – Problem 18](https://mediaspace.minnstate.edu/media/1_7gdklble)
2. What does key word STATIC do to a variable and when will you declare a variable using the key word “STATIC”? Give examples  
   [Video Clip – Problem 19](https://mediaspace.minnstate.edu/media/1_93j5ar1b)
3. How and where will you declare a variable needed by all Sub procedures in an application  
   [Video Clip – Problem 20](https://mediaspace.minnstate.edu/media/1_k2upny7o)
4. What is event-driven programming  
   [Video Clip - Problem 21](https://mediaspace.minnstate.edu/media/1_og0fuoxp)
5. What is an assignment operator? What is on left hand side and on the right hand side of the assignment operator?  
   [Video Clip – Problem 22](https://mediaspace.minnstate.edu/media/t/1_9a7cceke)