

Lesson 8 – Intro to JavaScript – Control Flow – Ifs and LOOPs

As with IPO operations, ifs and loops have the same logic as Python, but again syntax is a bit different. Have a loop at the following videos – we will look at ifs first.

<https://www.youtube.com/watch?v=PgUXiprlg1k> – Basic if – ignore the last section.

<https://www.youtube.com/watch?v=2gE2K8i5tvs> – Using the Switch statement.

Discuss Block Level Scope using if statements. Research and be ready to discuss in class.

<https://www.youtube.com/watch?v=ZOQYIWLngSU> – for loops.

<https://www.youtube.com/watch?v=TDUz9QcGPoE> – while loops

IF Practice Exercises

1. A local company called **The Snuggly Company** sells a unique product called The Snuggly and would like a program to help process customer orders.

The program requires the user to enter the customer's name, street address, city, province and postal code, phone number and credit card number, along with the number of Snugglys they wish to purchase.

The total cost of the Snuggles are \$29.99 for the first, \$24.99 each for orders between 2 and 10, and 21.99 each for orders exceeding 10. Shipping costs are \$3.99 per Snuggly for orders of 6 or more, and 5.99 per Snuggly otherwise. The Subtotal is the cost of Snugglys plus the shipping.

Sales tax is 15% for all orders based on the subtotal. The total order is the subtotal plus the taxes. The credit card company charges The Snuggly Company 3% on the total order as a service charge. This amount is not charged to the customer and appears on the screen display only.

SNUGGLY COMPANY Customer Purchase Receipt	
Customer Details:	
XXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXX, XX XXXXXX	
Purchase Details:	
Snuggly Cost:	\$#,###.##
Shipping Cost:	\$#,###.##

Subtotal:	\$#,###.##
HST(@ ##%):	\$#,###.##

Invoice Total:	\$#,###.##
	=====
HST Registration #:	34-FG55-83993
CC Service Charge:	\$#,###.##

Prepare the output to appear as follows:

2. Design a program to be used by the **Golds Gym** to bill their members. Set up constants as required.

The user will input from the keyboard the membership number, member name, street address, city, province, postal code, phone number, the total number of family members on the account, an option for towel service (Enter a Y or an N), an option for executive treatment (Y or an N), the current day (1-31), the current month (1-12), and the current year (9999).

Calculate the membership cost using \$125 for the first member and \$75.00 for each additional member. Calculate the total cost of options using a rate of \$7.00 for towel service and \$18.00 for executive treatment. Add the values together for the total extra costs. Note that if the user enters a N for either option the cost for that service will be 0. The monthly fees are the membership cost plus the total extra costs.

Tricky. A Registration fee is paid up front when the membership is started. There is an initial fee of \$49.99 plus the pro-rated membership cost for the current month – based on the remaining days in the month. For this calculation determine the total number of days in the month – remember Feb could be a leap year. Now determine the number of days left in the current month. Divide the number of days left by the total number days in the month for the pro-rated percentage. Finally, multiply the monthly fees by the percentage - This is the pro-rated membership cost. Add this pro-rated cost to the initial fee for the registration fee. HST on the registration fee is calculated at 15% and the total due at signing is the registration fee plus HST.

The monthly fees will be the total membership cost calculated above. Calculate the HST (using 15%) on the monthly fees. Add the monthly fees and the HST to obtain the total monthly payment. This is the cost paid each month starting on the 1st of the following month.

If the member cancels their membership at any time, the cancellation fee is 60% of the membership cost for 3 months.

Note that the registration fee is the initial fee the customer will pay when they sign up, and the total monthly fee if the amount paid on the 1st day of each month. Display all input values and calculated values to the screen – display the registration fees and HST first, then display the monthly payment and HST after. The cancellation fee will appear at the end of the receipt.

3. Enter a balance due and a credit limit for a customer. If the customer is under the credit limit calculate the payment due at 10% of the balance, otherwise calculate the payment due as 10% of the balance + the amount they are over the credit limit. If the customer is under their credit limit, the status is assigned a value of OK. If not, the status is assigned the value "OVER". Also, if they are over their credit limit by more than \$1,000.00, concatenate the word "CREDIT CHECK" after the status.
4. Museum Price Challenge. Let's assume that we have a museum that has the following policy for the admission price based on a full price ticket of \$22.50.
 - The museum is closed on Mondays.
 - Everyone gets half price discount on Tuesday and Thursdays.
 - If you are age between 13 and 20 inclusive, you will get a 25% discount on Wednesdays.
 - If you are younger than 6, or older than 65, your admission is free.
 - If you are age between 6 and 12 inclusive, your admission is half price on the Weekend (Saturday and Sunday).

LOOP Practice Exercises

5. Prepare a loop that will execute 10 times. Each time the loop executes, print the number. The output of the program will appear as follows:

```
1
2
:
9
10
```

6. Write a program that will process temperatures in Celsius between -20 to +30. For each Celsius temperature, calculate the temperature in Fahrenheit using the formula $F = 9 / 5 * \text{Celsius} + 32$. Print the temperature in Celsius and the temperature in Fahrenheit. Include a heading for the two columns at the beginning. Output will appear as follows:

```
Celsius  Fahrenheit
-----
-20      -4
-19      -2.2
          :
29       84.2
30       86.0
-----
```

7. Prepare a program that will allow the user to enter a loan amount, and the reason for the loan. Create a loop that will execute for the number of Years between 1 and 10. For each year, calculate interest using the equation $I = PRT$ where P is the amount of the loan, R is the interest rate, and T is the number of years. Add the interest to the loan amount for the total amount to be repaid. Finally, calculate the monthly payment by dividing the amount to be repaid by the number of months (years multiplied by 12). Print the year, the loan amount, the total to be repaid, and the monthly payment for each year. Use a standard interest rate of 6.5% per year.

```
Loan Options for 10 Years on $#,###.##
```

```
Years      Interest    Total Amt    Mon Payment
-----
#          $#,###.##    $#,###.##    $#,###.##
          :
#          $#,###.##    $#,###.##    $#,###.##
-----
```

Additional Exercise with Ifs and LOOPS

A St. John's holiday company, Cruise Vacations, requires a program to determine the total cost of a vacation. Allow the program to repeat until the user specifies END for the first name, or prompt the user and ask if they would like to continue (Y / N) at the end of the program.

Input includes the customer's first name, the last name, the vacation destination, the departure date, the number of persons, the cost per week, the number of weeks, and a value to represent if the customer needs a connector flight to Toronto (Y or N). Make the screen easy to read with headings and prompts.

Determine the vacation cost as the number of person's times the cost per week times the number of weeks. Also include a fee of \$350.00 per person for the connecting flight to Toronto if required. Sales tax is 13% of the cost, and the total cost is the vacation cost plus the sales tax. If the total cost is over \$2000.00 or the length of the vacation is over 2 weeks, give the customer a 5% discount on the vacation cost only.

Display all input values, and all calculated results. Only display the discount if one is given between the tax and the total. Make it look like a receipt with headings and formatted results.

The company also offers its customers the option of paying for the vacation in equal monthly payments at 6.5% yearly interest. **Simple interest** is calculated as the Principal Loan Amount * Yearly Interest Rate * Number of years. For 3 months use the Number of Months / 12 to make it yearly. Add the interest to the principal loan amount, then calculate the payment as the total / number of months.

Display the payments based on a single payment, or payments for 3, 6, 9, 12, or 15 month terms. Use a loop and display the payments based on the following table at the end of your receipt.

# Payments	Monthly Payment
-----	-----
3	\$9,999.99
6	\$9,999.99
9	\$9,999.99
12	\$9,999.99
15	\$9,999.99

$$P = \frac{r(PV)}{1 - (1 + r)^{-n}}$$

BONUS: You can also calculate the monthly payment using **compound interest** to calculate the monthly payment where P is the calculated monthly payment, PV is the principal amount of the loan, r is the monthly rate in decimal form – divide the rate / 1200, and n is the number of months.

P = Payment
PV = Present Value
r = rate per period
n = number of periods

See you in class.