**CS-111 Intro Structured Programming**

**Activity 3 – Conditionals**

1. Please find out if there are line/lines that will never run in the following codes.

|  |  |
| --- | --- |
| number = input('Please Enter a Number: ')  number = int(number)  if number < 100:  print('Small')  elif number >= 100:  print('Big')  else:  print('Neither Small nor Big') | number = input('Please Enter a Number: ')  number = int(number)  if number < 100:  print('Small')  elif number < 80:  print('Smaller')  elif number < 50:  print('Even Smaller')  else:  print('An interesting number') |

1. Write a program that asks the user for a positive number input.

* Check if the input is a positive number and if so,
  + Check if the number is smaller than 10, 100 and 1000 respectively and print the number of digits the number has. (Single Digit, Double Digits, etc.)
  + If the number is greater than 1000, print ‘Lots of Digits’.
* If the input is not a positive number, print an error message accordingly.
* Put your code in a try/except block and print an error message if the user fails to enter a valid number.

1. Write a program to print ‘Good Job’ if the user input is a multiple of 8 and ‘Try Again’ if not.
2. Write a program to calculate the electricity bill.

* Ask the user to enter how many kilowatts of electricity they have used that month.
* Calculate the bill according to the following criteria.
  + The first 100 kilowatts are always free of charge.
  + If up to and including 1,000 kws, the price is 10 cents per kw.
  + If more than 1.000 kws, the price is 15 cents per kw (first 100 kws are still free).
* Print the bill amount with a message.

1. Write a program to calculate the bonus amount of an employee.

* Ask user for their yearly salary and years of service.
* Calculate the bonus according to the following criteria.
  + Up to and including 5 years is 3%
  + Between 6 and 10 years is 5%
  + Over 10 years is 10%
* Print the bonus amount with a message.

1. Write a mini-calculator program that asks the user for two numbers and one of four mathematical operators (+,-, \*, /) to print out the result with a message. If the user fails to enter one of the four operators, print out an error message.

Ex: First Number: 5 First Number: 5

Second Number: 7 Second Number: 7

Operation: \* Operation: division

Result: 35 Please Enter a Valid Operator!

1. Write a program for the HR department to calculate wages for prospective employees.

* Ask the user for inputs of age, education level and years of experience of the employee.
  + Make the user select one of the three education levels; Bachelor, Master’s or PhD by typing either B, M or P as the input.
* Calculate the wage according to the following criteria.
  + Between the ages 18 and 30, the wages are $1000 per week.
  + Between the ages 31 and 60, the wages are $1200 per week.
  + The wages increase per level of education; +10% for Bachelors, +20% for Master’s and +30% for PhD degrees.
  + Over 10 years of experience is another %10 increase.
* Print out the wages with a message.

1. Write a program that calculates a person’s body mass index (BMI). A person’s BMI is calculated with the formula below where weight is measured in pounds and height is measured in inches.

*BMI = 703 \* weight / height²*

* Ask the user to enter his or her weight and height, then print the user’s BMI with a message.
* Also print out a message indicating whether the person has optimal weight, is under optimal weight, or is over optimal weight according to the following criteria.
  + A person’s weight is considered to be optimal if his or her BMI is between 18.5 and 25.
  + If the BMI is less than 18.5, the person is considered to be under optimal weight.
  + If the BMI value is greater than 25, the person is considered to be over optimal weight.

1. Write a program for a company that sells peppermint bark in bulk. The price is $10 for a container. The company has a discount policy of 10% for orders of more than 50 containers and 20% for more than 100.

* Ask the user to enter the number of containers purchased.
* Display with a message, the discount amount, and the total price according to the quantity of purchase.

**‘Your total is 100 dollars today. You had a discount of 20 dollars.’**