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| C:\Users\Admin\Desktop\download.jpg | USMAN INSTITUTE OF TECHNOLOGY | | | | | |  |
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|  | Department of Computer Science  CS121 Object Oriented Programming | | | | | |  |
|  |  | Lab # 03  Selection Statements in Python | | | |  |  |
|  | Objective:  This experiment introduces the students to the concept of Decision Making in Programming and the use of Selection Statements in Python programming language. Different selection statements of Python including **if, if-else,** and **elif** statements are covered. | | | | | |  |
|  | **Name of Student:**  **Roll No: Sec.**  **Date of Experiment:** | | | | | |  |
|  | **Marks Obtained/Remarks:**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Signature:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |  |

**Lab 03: Selection Statements In Python**

# Decision Making

Decision-making is the anticipation of conditions occurring during the execution of a program and specified actions taken according to the conditions. Decision structures evaluate multiple expressions, which produce TRUE or FALSE as the outcome. You need to determine which action to take and which statements to execute if the outcome is TRUE or FALSE otherwise. Following is the general form of a typical decision making structure found in most of the programming languages.

# IF Statement

The IF statement is similar to that of other languages. The if statement contains a logical expression using which the data is compared and a decision is made based on the result of the comparison.

if expression:

statement(s)

var1 = 100

if var1:

print ("1 - Got a true expression value")

print (var1)

var2 = 0

if var2:

print ("2 - Got a true expression value")

print (var2)

print ("Good bye!")

# IF...ELIF...ELSE Statements

An else statement can be combined with an if statement. An else statement contains a block of code that executes if the conditional expression in the if statement resolves to 0 or a FALSE value.

The else statement is an optional statement and there could be at the most only one else statement following if.

if expression:

statement(s)

else:

statement(s)

amount = int(input("Enter amount: "))

if amount<1000:

discount = amount\*0.05

print ("Discount",discount)

else:

discount = amount\*0.10

print ("Discount",discount)

print ("Net payable:",amount-discount)

The elif statement allows you to check multiple expressions for TRUE and execute a block of code as soon as one of the conditions evaluates to TRUE.

Similar to the else, the elif statement is optional. However, unlike else, for which there can be at the most one statement, there can be an arbitrary number of elif statements following an if.

if expression1:

statement(s)

elif expression2:

statement(s)

elif expression3:

statement(s)

else:

statement(s)

amount = int(input("Enter amount: "))

if amount<1000:

discount = amount\*0.05

print ("Discount",discount)

elif amount<5000:

discount = amount\*0.10

print ("Discount",discount)

else:

discount = amount\*0.15

print ("Discount",discount)

print ("Net payable:",amount-discount)

# Student Exercise

1. Develop program for first grader to practice subtraction. The program randomly generates two single-digit integers, number1 and number2 with number1 > number2. The program asks the student a question such as “what is 9 – 2? “ After the student answers the question, the program displays a message indicating if it is correct

**Code:** from random import randint as r

print("=======Task 1===========")

# Task 1

a = r(1, 10)

b = r(1, 10)

print(a, "-", b, "=", "?")

ans = int(input("Enter your answer: "))

if ans == a - b:

    print("Correct")

else:

    print("Incorrect")

**Output:**

**Graphical user interface

Description automatically generated**

1. Body mass index (BMI) is a measure of health based on weight. It can be calculated by taking your weight in kilograms and dividing it by the square of your height in meters. The interpretation of BMI for people 16 years and older is as follows:

|  |  |
| --- | --- |
| BMI | Interpretation |
| Below 18.5 | Underweight |
| 18.5 – 24.9 | Normal |
| 25.0 – 29.9 | Overweight |
| Above 30.0 | Obese |

Write a program that prompts the user to enter a weight in pounds and height in inches and then displays the BMI. Note that one pound is 0.45356237 kilograms and one inch is 0.0254 meters.

**Code:**

# Task 2

weight = float(input("Enter your weight in pound: "))

height = float(input("Enter your height in inches: "))

weight = weight \* 0.453592

height = height \* 0.0254

bmi = weight / (height \*\* 2)

if bmi < 18.5:

    print("Underweight")

elif bmi < 24.9 and bmi > 18.5:

    print("Normal")

elif bmi < 29.9 and bmi > 25:

    print("Overweight")

elif bmi > 30:

    print("Obese")

**Output:**

**Text

Description automatically generated**

1. Write a program that lets the user enter a year and then determines whether it is a leap year. A year is a leap year if it is divisible by 4 but not by 100 or if it is divisible by 400.

**Code:** #Task 3

year = int(input("Enter a year: "))

if year % 4 == 0 and year % 100 != 0 or year % 400 == 0:

    print("Leap Year")

else:

    print("Not a leap year")

**Output:**

**Graphical user interface

Description automatically generated with low confidence**

1. Write a program that lets the use guess whether a flipped coin displays the head or the tail. The program randomly generates an integer 0 or 1, which represents head or tail. The program prompts the user to enter a guess and reports whether the guess is correct or incorrect.

**Code:** toss = r(0, 1)

ans = int(input("Enter 0 for heads and 1 for tails: "))

if ans == toss:

    print("Correct")

else:

    print("Incorrect")

**Output:**

A picture containing graphical user interface

Description automatically generated

1. Write a program that plays the popular scissor-rock-paper game. A scissor can cut a paper, a rock can knock a scissor, and a paper can wrap a rock. The program randomly generates a number 0, 1, or 2 representing scissor, rock, and paper. The program prompts the user to enter a number 0, 1, or 2 and displays a message indicating whether the user or the computer wins, loses or draws.

**Code:** user = int(input("Enter 0 for rock, 1 for paper, 2 for scissors: "))

computer = r(0, 2)

if user == computer:

    print("Draw")

elif user == 0 and computer == 1:

    print("Computer wins")

elif user == 1 and computer == 2:

    print("Computer wins")

elif user == 2 and computer == 0:

    print("Computer wins")

else:

    print("User wins")

**Output:**

**Graphical user interface

Description automatically generated**

1. Develop a program to play a lottery. The program randomly generates a two-digit number, prompts the user to enter a two-digit number, and determines whether the user wins according to the following rules.
   1. If the user’s input matches the lottery in the exact order, the reward is $10,000.
   2. If all the digits in the user’s input match all the digits in the lottery number, the award is $3000
   3. If one digit in the user’s input matches a digit in the lottery number, the award is $1000

**Code:** user = int(input("Enter your lottery number: "))

computer = r(10, 20)

if user == computer:

    print("You win $10,000")

elif user % 10 == computer % 10:

    print("You win $3,000")

elif user % 100 == computer % 100:

    print("You win $1,000")

else:

    print("You win nothing")

**Output:**

**A picture containing text

Description automatically generated**