

# **Computing for Engineers – ENGG 233**

## **Lab 1**

**Erfan Aghaeekiasarae**

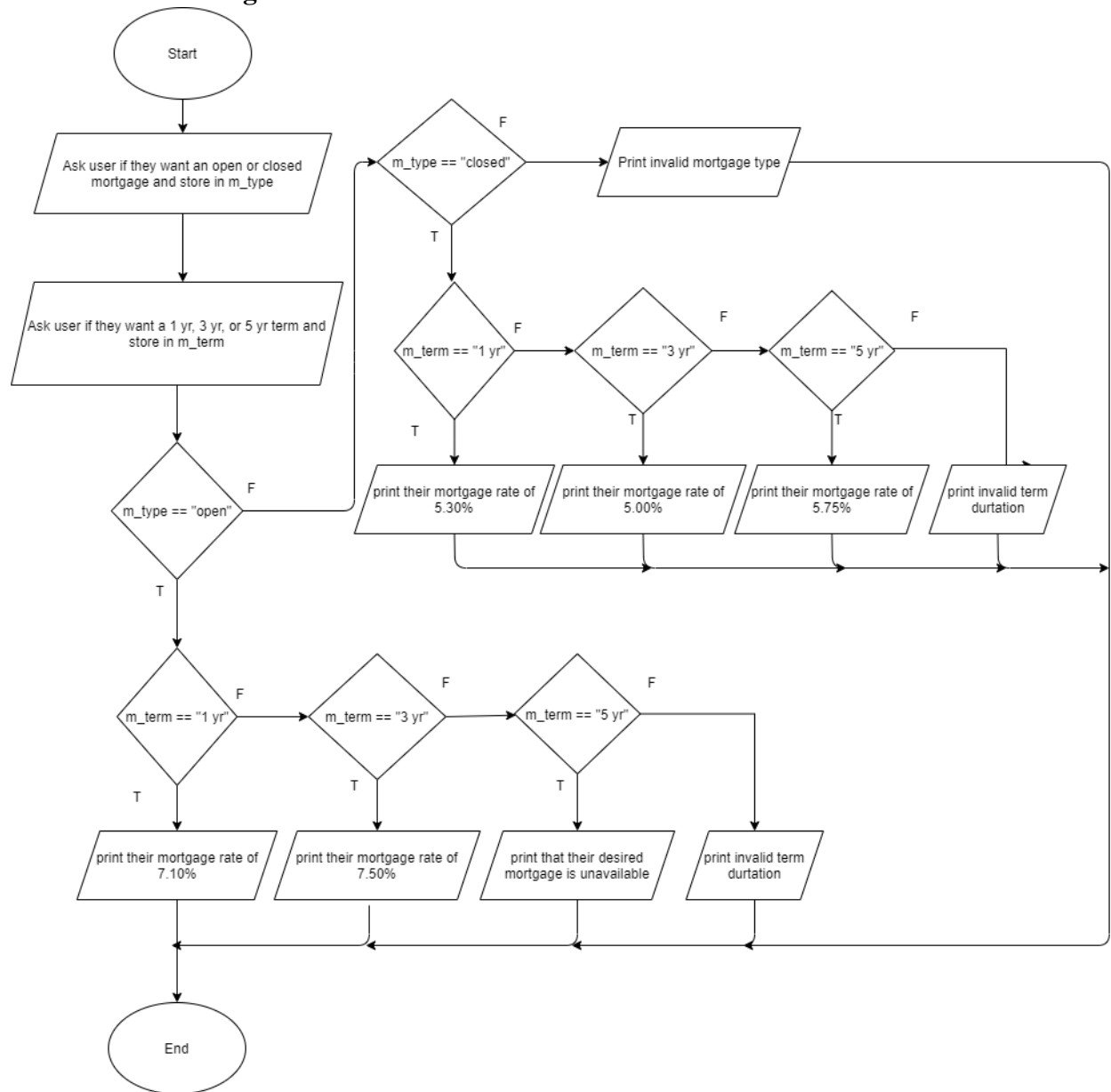
**Jaxon Braun**

**Lab Section L01**

**Lab Group Orange**

**October 2, 2020**

## Exercise 1: Drawing a Flowchart



## Exercise 2: Simple if-else Structure

### Task 2.1: Absolute Value

```
x = int(input("Enter a number:"))  
  
if(x < 0):  
    print(x * (-1))  
else:  
    print(x)
```

### Sample Output

```
Enter a number:-37  
37
```

### Task 2.2: Logical Expressions

- b)  $(x > y \text{ and } x < z) \text{ and } (x < 10 \text{ or } x \geq 100)$
- c)  $(a \leq 0 \text{ or } x > 90) \text{ and } (a == b)$
- d)  $(y \geq 50) \text{ and } (y > z \text{ and } y \leq x)$

## Exercise 3: Strings and Characters

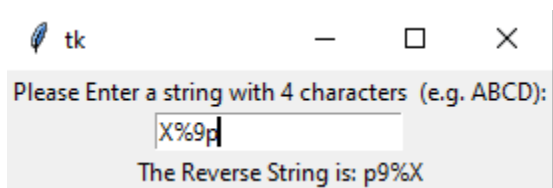
### Task 3.1: Char

```
import tkinter as tk

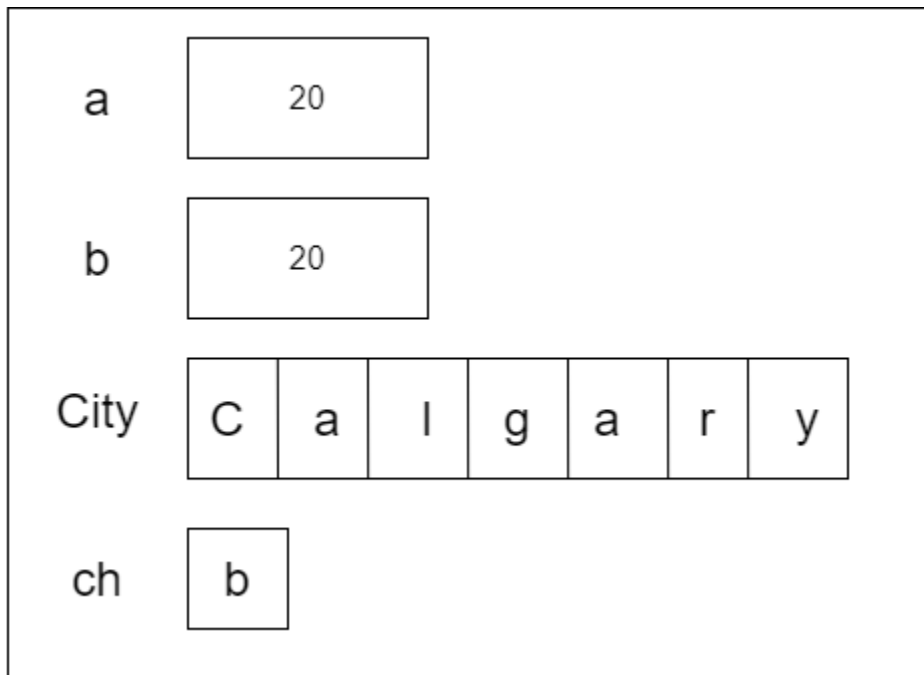
def evaluate(event):
    myString = entry.get()
    char1 = myString[3]
    char2 = myString[2]
    char3 = myString[1]
    char4 = myString[0]
    reverseString = str(char1+char2+char3+char4)
    #reverseString = myString[::-1] could be used if we wanted to be reverse
    #strings of any length, but this hasnt been taught yet so I didn't use

    results = reverseString
    res.configure(text = "The Reverse String is: " + results)

w = tk.Tk()
tk.Label(w, text="Please Enter a string with 4 characters (e.g. ABCD):").pack()
entry = tk.Entry(w)
myString = entry.get()
print(myString)
entry.bind("<Return>", evaluate)
entry.pack()
res = tk.Label(w)
res.pack()
w.mainloop()
```



### Task 3.2: Simple Memory Diagram



#### Exercise 4: Flowchart to Code

```
m_type = str(input("Do you want an 'open' or 'closed' mortgage?: "))
m_term = str(input("Do you want a '1 yr', '3 yr', or '5 yr' term?: "))

if(m_type == "open"):
    if(m_term == "1 yr"):
        print("Your mortgage rate will be 7.10%")
    elif(m_term == "3 yr"):
        print("Your mortgage rate will be 7.50%")
    elif(m_term == "5 yr"):
        print("Your desired mortgage is unavaible, please try again")
    else:
        print("invalid term duration, please try again")
elif(m_type == "closed"):
    if(m_term == "1 yr"):
        print("Your mortgage rate will be 5.30%")
    elif(m_term == "3 yr"):
        print("Your mortgage rate will be 5.00%")
    elif(m_term == "5 yr"):
        print("Your mortgage rate will be 5.75%")
    else:
        print("Invalid term duration, please try again")
else:
    print("Invalid mortgage type, please try again")
```

```
Do you want an 'open' or 'closed' mortgage?: closed
Do you want a '1 yr', '3 yr', or '5 yr' term?: 3 yr
Your mortgage rate will be 5.00%
```

## Exercise 5: Finding Divisible Digits

```
num = str(input("Please enter a six digit number: "))
digit1 = int(num[0])
print("The digits in the number you gave that can be divided my the first digit are: ")

if(int(num[1]) % digit1 == 0):
    print(num[1])
if(int(num[2]) % digit1 == 0):
    print(num[2])
if(int(num[3]) % digit1 == 0):
    print(num[3])
if(int(num[4]) % digit1 == 0):
    print(num[4])
if(int(num[5]) % digit1 == 0):
    print(num[5])
```

```
Please enter a six digit number: 246795
The digits in the number you gave that can be divided my the first digit are:
4
6
```

## Exercise 6: Advanced Decision Structures

```
Please enter your province's two-letter abbreviation (e.g., AB for Alberta): ab
Please enter your taxable income: 160000
Gross Income: 160000.0
Tax Rate: 0.39
Tax Amount: 62400.0
Net Income 97600.0
```

```
Please enter your province's two-letter abbreviation (e.g., AB for Alberta): bc
Please enter your taxable income: 80000
Gross Income: 80000.0
Tax Rate: 0.365
Tax Amount: 29200.0
Net Income 50800.0
```

```
Please enter your province's two-letter abbreviation (e.g., AB for Alberta): sk
Please enter your taxable income: 40000
Gross Income: 40000.0
Tax Rate: 0.25
Tax Amount: 10000.0
Net Income 30000.0
```