Assignment 1

1. This is my solution code:

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# Author: Cao Dat Nguyen
# Date: 2/2/2023
# This Program is a bill interaction between the customers and the calculator
# It will let them know how much the bill is based on the amount the customers use

# Greeting to customers about the Global Energy Bill calculator
print("Welcome to the Global Energy Bill calculator!")

# Ask customers to type their information about the bill
account = input("Enter your account number: ")
month_number = input("Enter the month number(e.g., for January, enter 1): ")
electricity_plan = input("Enter your electricity plan (EFIR or EFLR): ").upper()

# Store the variables
tax_rate = 0
prices = 0
monthly_fee = 120.62
monthly_gas_transaction_fee = 1.32

# Check if the customers type electricity plan correct and ask them to type again if wrong
if electricity_plan != "EFIR" and electricity_plan != "EFLR":
    print("Please type the information again!")
    electricity_plan = input("Enter your electricity plan (EFIR or EFLR): ").upper()

# Ask customers to type their next information
electricity_used = input("Enter the electricity used in month " + month_number + " (in kWh): ")
electricity_used = float(electricity_used)
gas_plan = input("Enter your gas plan (GFIR or GFLR): ").upper()
```

```
# Check if the customers type the gas plan correct and ask them to type again if wrong
if gas_plan != "GFIR" and gas_plan != "GFLR":
    print("Please type the correct information again!")
    gas_plan = input("Enter your gas plan (GFIR or GFLR): ").upper()

# Ask customers to type their next information
gas_used = float(input("Enter the gas you used in month " + month_number + " (in GJ): "))
province = input("Enter the abbreviation for your province of residence (two letters): ").upper()

# Check if the customers type the province correct and ask them to type again if wrong
if province != "AB" and province != "BC" and province != "MB" and \
        province != "NT" and province != "NU" and province != "QC" and \
        province != "SK" and province != "YT" and province != "ON" and \
        province != "NB" and province != "NL" and province != "NS" and province != "PE":
    print("Please type the correct information again!")
    province = input("Enter the abbreviation for your province of residence (two letters): ").upper()

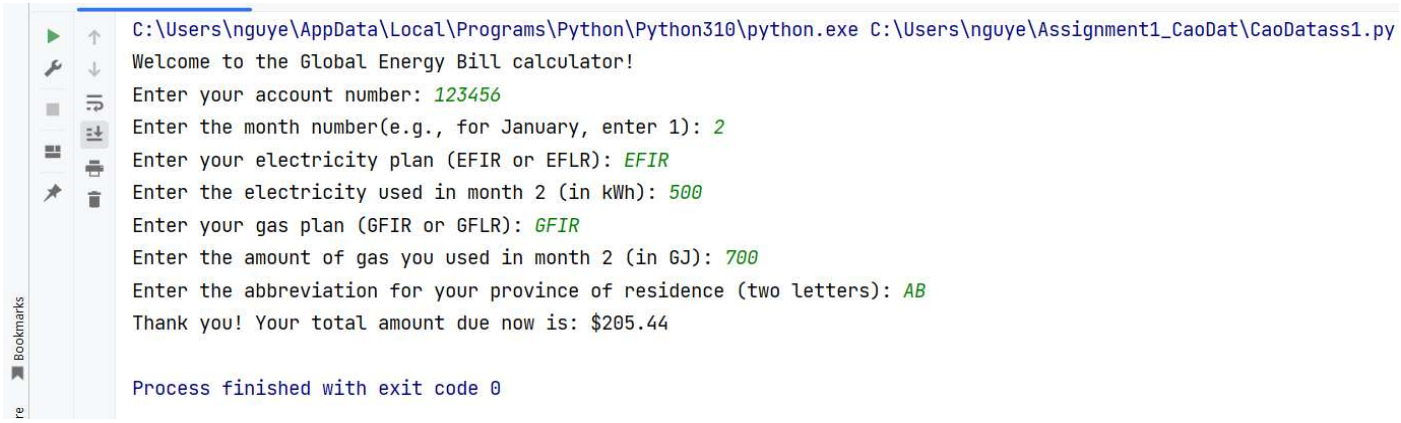
# Calculator will process with the province customers are living
if province == "NB" or province == "NL" or province == "NS" or province == "PE":
    tax_rate = 0.15
elif province == "ON":
    tax_rate = 0.13
else:
    tax_rate = 0.05
```

```
# Calculate the price of the electricity and gas plan with 4 cases:
if electricity_plan == "EFIR" and gas_plan == "GFIR":
    if electricity_used <= 1000 and gas_used <= 950:
        prices = 8.36 * electricity_used + 4.56 * gas_used
    elif electricity_used <= 1000 and gas_used > 950:
        prices = 8.36 * electricity_used + 4.56 * 950 + 5.89 * (gas_used - 950)
    elif electricity_used > 1000 and gas_used <= 950:
        prices = 1000 * 8.36 + 9.41 * (electricity_used - 1000) + 4.56 * gas_used
    else:
        prices = 1000 * 8.36 + 9.41 * (electricity_used - 1000) + 4.56 * 950 + 5.89 * (gas_used - 950)
elif electricity_plan == "EFIR" and gas_plan == "GFLR":
    if electricity_used <= 1000:
        prices = 8.36 * electricity_used + 3.93 * gas_used
    else:
        prices = 1000 * 8.36 + 9.41 * (electricity_used - 1000) + 3.93 * gas_used
elif electricity_plan == "EFLR" and gas_plan == "GFIR":
    if gas_used <= 950:
        prices = 9.11 * electricity_used + 4.56 * gas_used
    else:
        prices = 9.11 * electricity_used + 4.56 * 950 + 5.89 * (gas_used - 950)
else:
    prices = 9.11 * electricity_used + 3.93 * gas_used

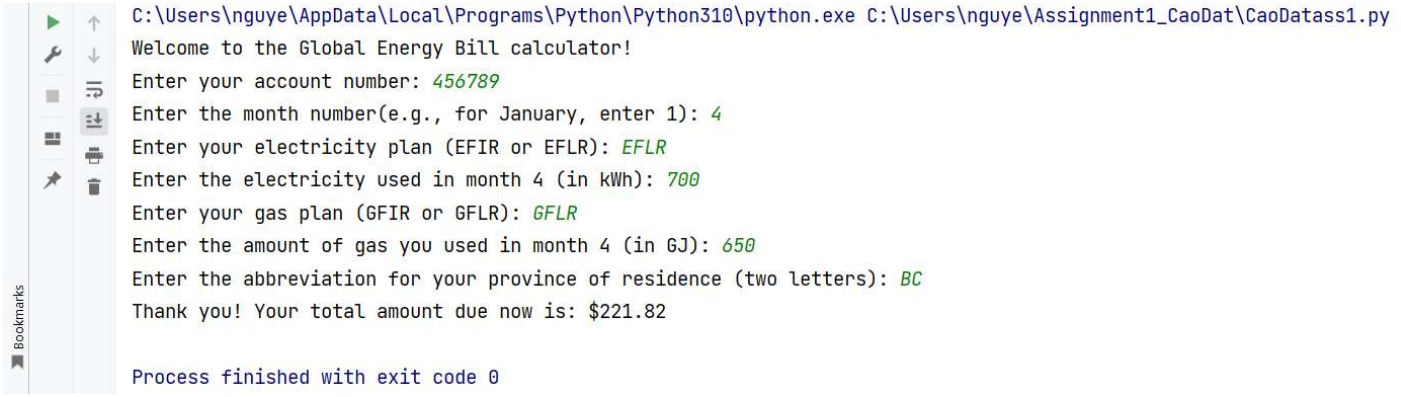
# Give the total amount that the customers use
canadian_dollars = prices * 0.01
total = float(monthly_fee + canadian_dollars + monthly_gas_transaction_fee) * (1 + tax_rate)
print("Thank you! Your total amount due now is: " + "$" + str(round(total, 2)))
```

2. This is my test output:

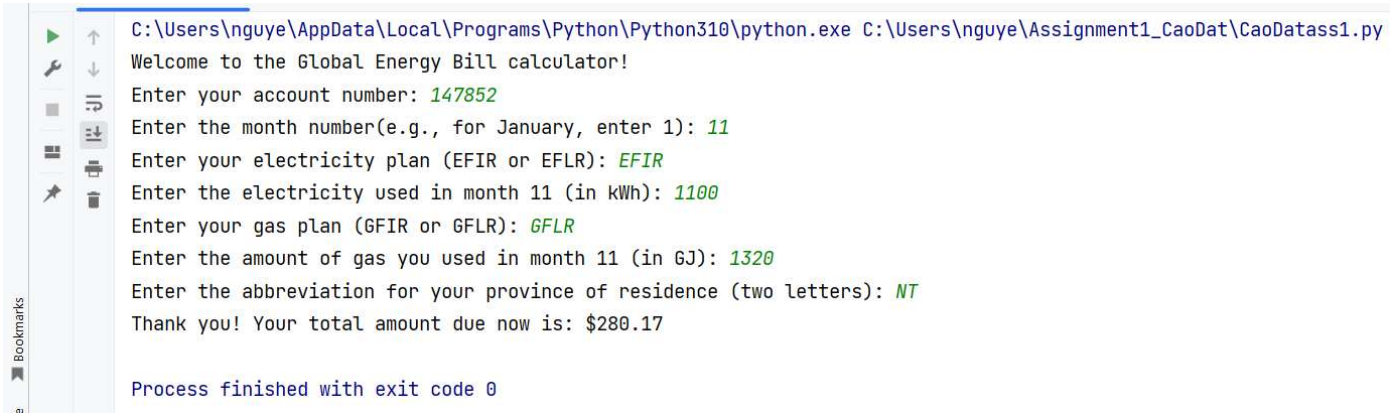
- **Test 1**



- **Test 2**



- **Test 3**



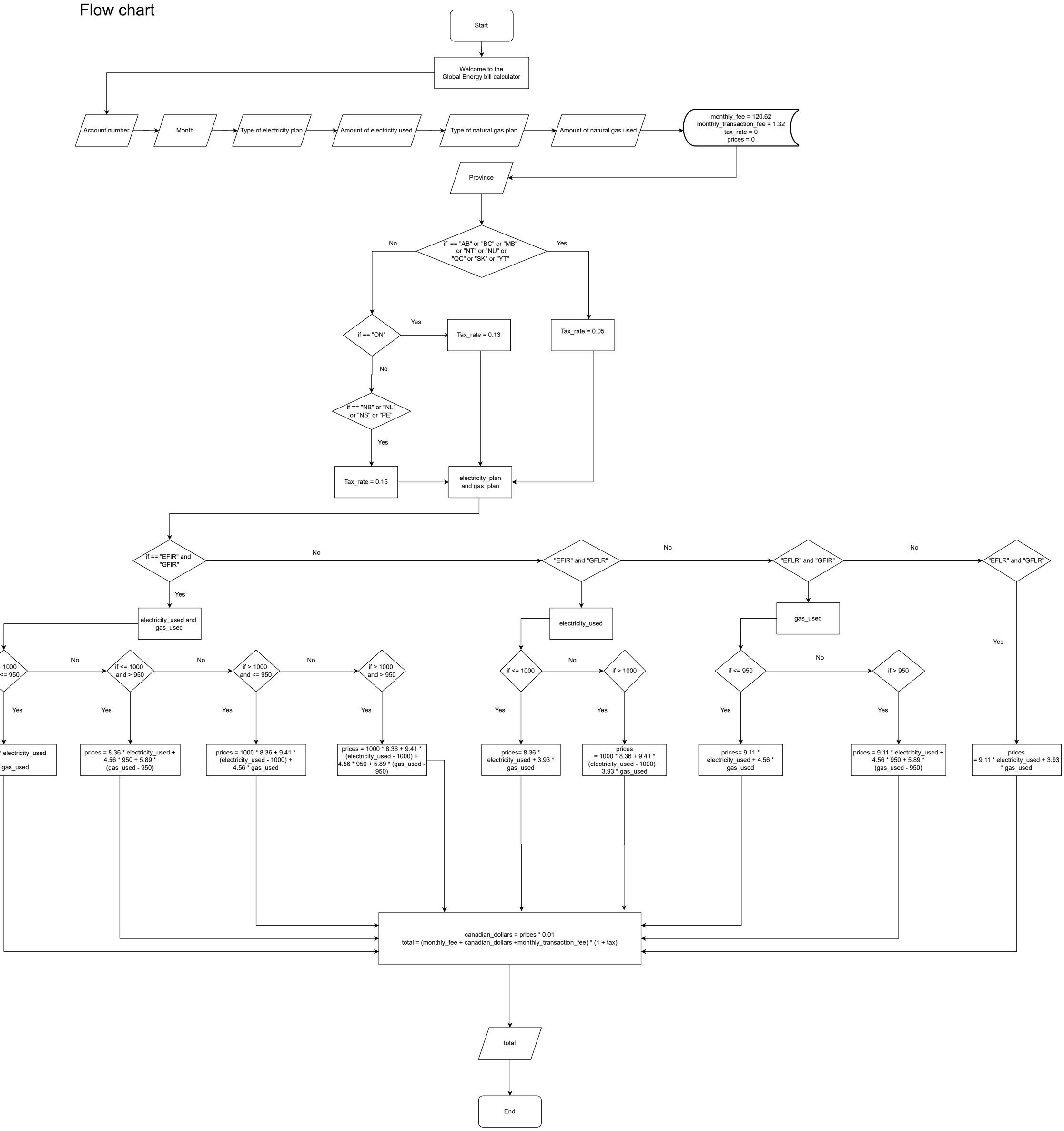
Marking Criteria

	Needs Improvement (0–50%)	Good (51–75%)	Excellent (76–100%)	Marks
Flow chart	• Largely incomplete • Poor structure	• Good overall design, but not complete or there are steps missing	• Excellent design which can be followed to write a functional code • No missing steps or branches	**DONE**
Working code	• The project doesn't run in all scenarios • Input requests work but don't match the scenario • Syntax of if/else statements has mistakes • Output works but doesn't match the scenario	• The project runs in all scenarios • Input requests work but don't match the scenario • Correct use of if/else statements • Output works but doesn't match the scenario	• The project runs in all scenarios • Input requests match the scenario exactly • Correct use of if/else statements • Output matches the scenario	**DONE**

Style	• Indentation – not consistent • Readability – poor variable names • Documentation ○ No comments are included at the top. ○ No comments indicating major code sections or what they do	• Indentation – some parts are consistent and some are not • Readability – some variable names are not ideal • Documentation ○ Comments at the top are missing or incomplete. ○ Comments indicating major code sections and what they do are incomplete	• Indentation – consistent • Readability – good variable names • Documentation ○ Comments at the top are complete and include name, date, program description including details on inputs, processing and outputs (4–5 sentences minimum). ○ Comments indicate major code sections and what they do	**DONE**

Testing	• Sample output doesn't match the provided test plan • Output is not formatted according to the specification (test plan)	• Parts of the sample output don't exactly match the provided test plan • Output formatted according to the specification (test plan)	• Sample output exactly matches the provided test plan • Output formatted according to the specification (test plan)	**DONE**
			Total	**DONE**

Flow chart


Start
Welcome to the
Global Energy bill calculator
Account number
Month
Type of electricity plan
Amount of electricity used
Type of natural gas plan
Amount of natural gas used
monthly_fee = 120.62
monthly_transaction_fee = 1.32
tax_rate = 0
prices = 0
Province
if == "AB" or "BC" or "MB"
or "NT" or "NU" or
"QC" or "SK" or "YT"
No
Yes
if == "ON"
Yes
Tax_rate = 0.13
Tax_rate = 0.05
No
if == "NB" or "NL"
or "NS" or "PE"
Yes
Tax_rate = 0.15
electricity_plan
and gas_plan
if == "EFIR" and
"GFIR"
No
"EFIR" and "GFLR"
No
"EFLR" and "GFIR"
No
"EFLR" and "GFLR"
Yes
electricity_used and
gas_used
electricity_used
gas_used
Yes
if <= 1000
and <= 950
No
if <= 1000
and > 950
No
if > 1000
and <= 950
No
if > 1000
and > 950
Yes
if <= 1000
No
if > 1000
Yes
if <= 950
No
if > 950
Yes
prices = 8.36 * electricity_used
+ 4.56 * gas_used
prices = 8.36 * electricity_used +
4.56 * 950 + 5.89 *
(gas_used - 950)
prices = 1000 * 8.36 + 9.41 *
(electricity_used - 1000) +
4.56 * gas_used
prices = 1000 * 8.36 + 9.41 *
(electricity_used - 1000) +
4.56 * 950 + 5.89 * (gas_used -
950)
prices= 8.36 *
electricity_used + 3.93 *
gas_used
prices
= 1000 * 8.36 + 9.41 *
(electricity_used - 1000) +
3.93 * gas_used
prices= 9.11 *
electricity_used + 4.56 *
gas_used
prices = 9.11 * electricity_used +
4.56 * 950 + 5.89 *
(gas_used - 950)
prices
= 9.11 * electricity_used + 3.93
* gas_used
canadian_dollars = prices * 0.01
total = (monthly_fee + canadian_dollars +monthly_transaction_fee) * (1 + tax)
total
End