

Class 4 - July 17th Notes

Ex 1: Writing a function

Slide 12

```
def value(amount, years, rate):
    futVal = amount*(1+rate/100)**years
    print("$",format(futVal,',.2f'),sep='')

def main():
    amount = float(input("Enter amount: "))
    years = int(input("Enter number of years: "))
    rate = float(input("Enter rate: "))

    #printing the input, my IDE doesn't support displaying input
    print("Enter amount: {}".format(amount))
    print("Enter number of years: {}".format(years))
    print("Enter rate: {}".format(rate))

    print("In",years,"years you will have: ", end='')
    value(amount, years, rate)

main()

Enter amount: 1000.0
Enter number of years: 5
Enter rate: 12.0
In 5 years you will have: $1,762.34
```

Ex 2: Rewrite Ex 1 as a value-returning function

Slide 16

```
def value(amount, years, rate):
    futVal = amount*(1+rate/100)**years
    return futVal

def main():
    amount = float(input("Enter amount: "))
    years = int(input("Enter number of years: "))
    rate = float(input("Enter rate: "))

    #printing the input, my IDE doesn't support displaying input
    print("Enter amount: {}".format(amount))
    print("Enter number of years: {}".format(years))
    print("Enter rate: {}".format(rate))
```

```
x = value(amount, years, rate)
print("In", years, "years you will have: ${:.2f}".format(x))

main()

Enter amount: 1000.0
Enter number of years: 5
Enter rate: 12.0
In 5 years you will have: $1762.34
```

Exercise 3 Challenge – Groups of 3 write group member's names in your comments

- 1 person writes the main function (mainline logic, function calls, input/output text)
 - Agree on variable names
- 1 person writes the function to calculate the future value of the annuity [first output], return value
- 1 person writes the function to calculate the required annual savings amount [second output], return value

Enter total retirement savings goal: 1000000
Enter the yearly savings budget: 15000
Enter number of years until retirement: 20
Enter interest rate: 5

Saving \$15,000.00 per year, in 20 years you will have saved \$495,989.31

In order to save \$1,000,000.00 within 20 years, you would need to save \$30,242.59 each year

```
def fv_annuity(FV, PMT, N, I_Y):
    futVal = 0
    for i in range(N):
        futVal += PMT * (1 + I_Y / 100) ** i
    return futVal

def pmt_annuity(FV, PMT, N, I_Y):
    pmt_cal = 0
    r = I_Y / 100
    pmt_cal = FV * r / ((1 + r) ** N - 1)
    return pmt_cal
```

```

def main():
    savings_goal = float(input("Enter the retirement savings goal: "))
    budget = float(input("Enter the yearly savings budget: "))
    n = int(input("Enter the number of years until retirement: "))
    i_y = float(input("Enter the interest rate: "))
    FV_cal = fv_annuity(savings_goal, budget, n, i_y)
    print("Savings ${} per year, in {} years you will have saved $
{:.2f}".format(budget, n, FV_cal))
    PMT_cal = pmt_annuity(savings_goal, budget, n, i_y)
    print("In order to save ${} within {} years, you would need to
save {:.2f} each year".format(savings_goal, n, PMT_cal, ',.2f'))

main()

```

```

Savings $15000.0 per year, in 20 years you will have saved $495989.31
In order to save $1000000.0 within 20 years, you would need to save
$30242.59 each year

```