Mortgages assignment

Define initial parametrs

```
# Initial deposit
deposit = 10000

# Interest rate
i.rate = 0.06

# Time in years
t.years = 1

# Time in months
t.months = t.years * 12
```

Future value

```
# Future value
fv = deposit*(1 + i.rate)^(t.years)
eay = (fv - deposit)/deposit
list(fv, eay)
```

```
## [[1]]
## [1] 10600
##
## [[2]]
## [1] 0.06
```

```
# Future value (compund month)
fv.cm = deposit*(1 + i.rate/12)^(t.months)
eay.cm = (fv.cm - deposit)/deposit
list(fv.cm, eay.cm)
```

```
## [[1]]
## [1] 10616.78
##
## [[2]]
## [1] 0.06167781
```

```
fv = 10616.78
i.rate = 0.06
t.years = 1
t.months = t.years * 12

# Present value
pv = fv*(1/(1+i.rate)^(t.years))
pv
```

```
## [1] 10015.83
```

```
# Present value (compund month)
pv = fv*(1/(1+i.rate/12)^(t.months))
```

Annuity

```
annuity = function(payment,i.rate,t.years){
  period = seq(1:(t.years-1))
  fv = payment*sum((1 + i.rate)^period) + payment
  return(fv)
}

annuity.monthly = function(payment,i.rate,t.years){
  t.months = t.years * 12
  payment = payment/12
  period = seq(1:(t.months-1))
  fv = payment*sum((1 + i.rate/12)^period) + payment
  return(fv)
}

i.rate = 0.08
t.years = 5
payment = 2400

annuity(payment,i.rate,t.years)
```

```
## [1] 14079.84
```

```
annuity.monthly(payment,i.rate,t.years)
```

```
## [1] 14695.37
```

Present value of annuity

```
annuity.pv = function(payment,i.rate,t.years){
  period = seq(1:(t.years))
  fv = payment*sum(1/(1 + i.rate)^period)
  return(fv)
}

annuity.monthly.pv = function(payment,i.rate,t.years){
  t.months = t.years * 12
  payment = payment/12
  period = seq(1:(t.months))
  fv = payment*sum(1/(1 + i.rate/12)^period)
  return(fv)
}

i.rate = 0.08
t.years = 0.5
payment = 300*12
```

```
annuity.pv(payment,i.rate,t.years)
```

[1] 3333.333

```
annuity.monthly.pv(payment,i.rate,t.years)
```

[1] 1758.736

Accumulation of a Future Sum