**Savings**

**Analysis**

The savings program will get a user to enter the cost of a car and how many years they want to save for it. It will then work out how much it they will have to save each year using one of three methods, equal amount, fixed amount and decreasing amounts.

**Design**

There will be two classes, Savings and SavingUser. SavingUser will read in the cost of the car and the years they want to save. These values are then passed to Savings which will calculate the three different ways of saving that amount over the set amount of years. Those results will then be outputted by the SavingUser class.

|  |
| --- |
| **SavingsUser** |
|  |
| + main(String[] args) |

|  |
| --- |
| **Savings** |
| - cost: double  - years: integer |
| +equalMethod()  +decreasingMethod()  +fixedMethod |

**Pseudo Code**

Public class SavingsUser

Main = string args

Create new savings object

Create new scanner

Set numbers of years value

Get cost of car

Start If

value less than 0 output error message

end if

start else

get number of years

end else

start if

years value not between 1 and 10 out error

end if

start else

create new savings class

state value of car and years to save

output the equal method

output the decreasing method

output the fixed method

end else

end

Public class Savings

Create constructor

Method = equalMethod

Amount = cost/years

Start for

Saved = currentYear\*amount

Remaining = cost-saved

Output year, saved and remaining

End for

End

Method = decreasingMethod

Set remaining value

Set total value

sumOfYears= (years^2+years)/2

start for

amount = (((years-x)+1)/sumOfYears)\*cost

remaining = remaining – amount

total = total+amount

output x, amount, total and remaining

end for

end

Method = fixedMethod

Set remaining value

Set total value

Start for

Amount = (2/years)\*remaining

Total = total+amount

Remaining = remaining – amount

Output x, amount, total and remaining

End for

End

End

**Testing**

|  |  |  |
| --- | --- | --- |
| **Test** | **Expected** | **Actual** |
| Cost of the car is 9000 and the years saving is 5 | Equal: 1800 saved year 1 and 7200 left, 3600 saved year 2 and 5400 left, 5400 saved year 3 and 3600 left, 7200 saved year 4 and 1800 left, 9000 saved year 5 and 0 left |  |
|  | Decreasing:  3000 saved in year 1 and 6000 remaining, 5400 saved and 3600 remaining, 7200 saved and 1800 remaining, 8400 saved and 600 remaining, 9000 saved and 0 remaining |  |
|  | Fixed:  3600 saved and 5400 remaining, 5760 saved and 3240 remaining, 7056 saved and 1944 remaining, 7833.60 saved and 1166.40 remaining, 8300.16 saved and 699.84 remaining |  |
| Value of car is 0 | Error appears |  |
| Value of the car is below 0 | Error appears |  |
| Number of years is below 1 | An error appears |  |
| Number of years is negative | An error appears |  |
| Number of years is 1 | Equal: 9000 saved and 0 remaining |  |
|  | Decreasing:  9000 saved and 0 remaining |  |
|  | Fixed:  9000 saved and 0 remaining |  |
| Number of years is above 10 | An error will appear |  |