Things to do week of 3/1/24

Monday

Loops. Nested loops

Review while loops

Give a quiz: sentinel controlled while loop

Review “while” and “for” loops

Show how to create a loop. Talk about compounded daily interest.

Input needed: principle, rate of interest, and term.

Daily interest is calculated: principle\*rate/365

Now make a loop around it for the number of days the investment is made (term), each day adding the daily interest to the principle.

Here is the code:

// interestIntro.cpp : Defines the entry point for the console application.

//

#include "stdafx.h"

#include <iostream>

using namespace std;

int \_tmain(int argc, \_TCHAR\* argv[])

{

double initialBalance,endingBalance, interest, rate;

int term, i;

cout << "Enter Principle: ";cin>>initialBalance;

cout << "Enter rate: ";cin>>rate;

if (rate>=1) rate = rate/100;

cout <<"Enter term in years: ";cin>>term;

endingBalance=initialBalance;

for (i=1; i<= term\*365; i++)

{

interest = endingBalance \* rate/365;

endingBalance=endingBalance+interest;

}

cout << "EndingBalance " <<endingBalance;

cin >> interest;

return 0;

}

Wednesday:

Talk about the assignment due and find out problems students are having.

Give a quiz on the above problem

How do we print interest earned each year?

Set year to 1.

Keep a running total of daily interest for 365 days.

yearlyInterest = yearlyInterest+dailyInterest;

on 365th day

print the year and yearlyInterest

yearlyInterest = 0;

year = year+1;

Here is the program output:

Enter Principle: 40000

Enter rate: 5

Enter term in years: 5

year: 1

beginning balance: 40000

Interest earned: 2050.7

ending balance: 42050.7

year: 2

beginning balance: 42050.7

Interest earned: 2155.83

ending balance: 44206.5

year: 3

beginning balance: 44206.5

Interest earned: 2266.36

ending balance: 46472.9

year: 4

beginning balance: 46472.9

Interest earned: 2382.55

ending balance: 48855.4

year: 5

beginning balance: 48855.4

Interest earned: 2504.7

ending balance: 51360.1

EndingBalance 51360.1

Here is the code for this program:

// interestIntro.cpp : Defines the entry point for the console application.

//

#include "stdafx.h"

#include <iostream>

using namespace std;

int \_tmain(int argc, \_TCHAR\* argv[])

{

double begBalance,endingBalance, interest, yearlyInterest=0,rate;

int term, i, year=1;

cout << "Enter Principle: ";cin>>begBalance;

cout << "Enter rate: ";cin>>rate;

if (rate>=1) rate = rate/100;

cout <<"Enter term in years: ";cin>>term;

endingBalance=begBalance;

for (i=1; i<= term\*365; i++)

{

interest = endingBalance \* rate/365;

yearlyInterest=yearlyInterest+interest;

endingBalance=endingBalance+interest;

if (i%365 == 0)

{

cout<< "year: " <<year; year++;

cout<<"\nbeginning balance: " <<begBalance;

cout<<"\nInterest earned: " <<yearlyInterest; yearlyInterest=0;

cout <<"\nending balance: " <<endingBalance<<"\n";

begBalance=endingBalance;

}

}

cout << "EndingBalance " <<endingBalance;

cin >> interest;

return 0;

}

------------------ nested loop ----------------------

#include "stdafx.h"

#include <iostream>

using namespace std;

int \_tmain(int argc, \_TCHAR\* argv[])

{

double begBalance,endingBalance, rate, interest, yearlyInterest=0;

int term, day, year;

bool y; char answer;

cout << "Enter Principle: ";cin>>begBalance;

cout << "Enter rate: ";cin>>rate;

if (rate>=1) rate = rate/100;

cout <<"Enter term in years: ";cin>>term;

endingBalance=begBalance;

for (year=1; year <=term; year++)

{

for (day=1; day <= 365; day++)

{

interest = endingBalance \* rate/365;

yearlyInterest=yearlyInterest+interest;

endingBalance=endingBalance+interest;

}

cout<< "year: " <<year;

cout<<"\nbeginning balance: " <<begBalance;

cout<<"\nInterest earned: " <<yearlyInterest; yearlyInterest=0;

cout <<"\nending balance: " <<endingBalance<<"\n";

begBalance=endingBalance;

}

--------------multiplication table --------------

for (int i=2; i<=10;i++)

{

for (int j=1; j<=12; j++)

cout << i << " x " << j <<" = " <<i\*j << "\n";

cout <<"\n";

}

---------------- flag controlled -------------------

Bool y;

cout << "\n\nNow to flag controlled: " <<"\n";

y=false;

while (!y)

{

for (day=1;day <= 365;day++)

cout << day <<" ";

cout<<"\nYou want to quit? (y to quit)";cin>>answer;

if (answer=='y') y=true;

}

cout <<"\nBoolean became true and I quit: \n";

------------------- post-test loop --------------

Do-While

In C++ the post-test construct is implemented using do-while. In case of data-validation

a do-while loop would look some thing like:

Do

Prompt and read the data

While the data is invalid ‘keep reading the data if the data entered is not valid.

Program 7-1

#include <iostream>

using namespace std;

int main()

{

int monthNum;

do

{

cout <<"Enter the month (a number ranging from 1 to 12) -- >";

cin >> monthNum;

if (monthNum <1 || monthNum >12) cout <<"Error! month not in

acceptable range!\n";

}

while (monthNum <1 || monthNum >12);

return 0;

}

Enter the month (a number ranging from 1 to 12) -- >20

Error! month not in acceptable range!

Enter the month (a number ranging from 1 to 12) -- >13 Error! month not in acceptable range!

Enter the month (a number ranging from 1 to 12) -- >0

Error! month not in acceptable range!

Enter the month (a number ranging from 1 to 12) -- >