

**Project 2 – Classes, objects, keyboard input, formatted output, selection****Due:** zip archive of *entire* project to Canvas by Thu, Oct 16 2025, 11:59 pm

Concepts covered in this assignment – keyboard input (Scanner class), formatted output to screen (printf), objects and classes, constructors, instance variables, getters and setters, UML diagram, String manipulation, selection (branching) – only use these concepts even if you can think of a more efficient solution. Solutions using concepts not covered will receive a big points penalty.

Your submission will be tested for plagiarism – against other students’ submissions and for generative AI code.

Slip Days allowed: yes

**Deliverables to Canvas:**

1. .zip file of the entire project
2. .pdf file of your test plan and your reflection

**Test plan:**

First, read the whole assignment and understand what it asks. Make a detailed test plan. A good test plan will also cover edge cases – where the program has to handle something unexpected or something that requires special handling (see the last screenshot on page 3). *Use your test plan to test your code!* Submit it in the form of a two-column table *with at least 10 test inputs* (10 rows), like this:

Test input	Expected output (balance)
ThieveS 587.16 TAX	500 (tax) 87.16 (donation) 0 (dark) 5 months tax paid
...	...

**Reflection:**

Along with your test plan, in the same .pdf file, submit a 2-3 paragraph reflection about your experience with the project. Address topics like what was tricky, what was easy, what you didn’t expect, what you had to pay special attention to, what you learned.

**Code:****Problem:**

Lord Havelock Vetinari, the Partician of Ankh-Morpork has devised a new way to do the city’s accounting as it pertains to the Ankh-Morpork professional guilds. There are currently 3 registered guilds – the Guild of Assassins, the Guild of Seamstresses, and the Guild of Thieves.

Starting today, Lord Vetinari designates 3 funds – a tax fund, a ~~bribe~~ donation fund, and a dark fund – every day they all start out at \$0. Write a program that will allow the Patrician’s Office’s clerk taking payments to receive keyboard input about which guild made a payment and about the amount and type of payment. Using this data your program will make an update to one or more of the three funds per transaction and print a receipt reflecting the payment. Some pre-written code is provided that will let you input data until you quit. The program should make decisions on the fund and receipt, based on the following parameters:

**The Tax Fund:**

The tax fund is updated by the amount of payment when one of the three registered guilds makes a valid payment designated as “tax”. Tax is \$100 a month for all guilds. The guild should receive the tax credit for as many years and/or months it has paid for. If the tax is not an exact multiple of 100, the guild should receive the tax credit for the months and years paid in full and the remaining amount should go into the donation fund.

For example, if a guild deposits \$203 in tax money, it should receive tax credit for 2 months, \$200 should go into the tax fund and the remaining \$3 go into the donation fund. You don’t ever return money!

### The Donation Fund:

The donation fund is updated by the amount of payment when one of the three registered guilds makes a valid payment designated as “donation”. When a valid donation is made, the guild may receive a credit of item(s) necessary to its business, if the amount is sufficient. The Guild of Assassins receives a credit of *one murder* per each \$60 of donation amount, the Guild of Seamstresses receives a credit of *one garment* (the Guild of Seamstresses doesn’t really do any sewing, fyi) per \$12 of donation, and the Guild of Thieves receives a credit of *one robbery* per \$25 of donation.

If the donation amount is insufficient for credit, the receipt should reflect that.

All donation moneys go into the donation fund.

### The Dark Fund:

The dark fund is updated by the amount of payment if the type of payment is any other than “tax” or “donation”. The dark fund is also updated by the payment amount if an unregistered guild makes any type of payment. Once money is in the hands of the Partician’s Office’s clerk, if it doesn’t have a clear designation, it tends to disappear into non-descript drawers.

After the decision has been made on which fund to update and the receipt has been printed, your program should also display the current standing of all three funds.

### Follow the steps:

- A. Open BlueJ (or use your IDE of choice but instructions here are to be used with BlueJ) and create a **new** project, call it Project2 (there should be no other existing code in your project). *Make a note of where your project folder (directory) is located on your computer.*
- B. Download the partially written **Project2.java** file from Canvas. Put it into your Project2 directory. Drag and drop the file into BlueJ.
- C. Create a new class, name it *Accounts*. The *Accounts* class will be the object that holds data about the city ledgers (the three accounts). An *Accounts* object will be created for you and passed to the methods you need to write.
- D. Implement the *Accounts* class according to the following UML diagram. Do not add or alter methods, make sure you spell all names exactly as in the UML. Make sure you have the correct visibility modifiers and return types. Document your class and *all* its method with doc-comments.

Accounts
- taxFund : double - donationFund : double - darkFund : double
+ Accounts() + getTaxFund() : double + getDonationFund() : double + getDarkFund() : double + addToTaxFund( \$ : double ) : void + addToDonationFund( \$ : double ) : void + addToDarkFund( \$ : double ) : void + allFunds() : double

The standard constructor should do nothing else but set the instance variables to neutral values

Instance variable values will be retrieved with the getter methods.

Instance variable values will be updated with the addTo.. methods.

The last method returns the current total of all funds

E. In the *Project2* class, write code to complete the *go* and *printTotals* methods.

*Hint:* Both the *go* and the *printTotals* methods receive the *Accounts* object created in the main as a parameter, so you always have access to the accounts data.

- a. Don't alter any code in the *main* method
- b. Don't change the method headers of the *go* and *printTotals* methods
- c. The *go* method should:
  - Keep asking for payments until the user enters a sentinel value for the guild name. The sentinel value notifying the program that the user wants to quit is any String value that starts with the letter "q" – so "quit", " QUIT", "quince ", "Quadriceps", " quandrum ", "Quidditch" etc. will all be valid sentinels.
  - Return *false* if the user has decided to quit and return *true* otherwise
  - Account for errors in capitalization and disregard leading and trailing spaces for *ALL* non-numeric input

*Hint:* String methods are your friends

- Print a receipt with a receipt number that is a random 3 digit zero-padded integer and date

*Hint:* The Math class is your friend

- Always ask for the guild name and the amount that is being deposited and only ask for the purpose of the payment if the amount is valid, then decide what happens to the money
- d. The *printTotals* method should:
    - Print the totals properly formatted and aligned after every transaction
  - e. Use the test cases below to check your program output for correctness

Below is an example run of a successfully completed program (although your program will be graded with test input that you haven't seen but which will adhere to the specifications and your program should be able to handle).

While normally creative programming is appreciated, given the example input, your output *MUST* look *exactly* like below - dashes, formatting, alignment, capitalization, prompts, and all, for full credit (except the receipt numbers and dates, which are generated on the fly for every program run).

When you are done, make sure your code is properly indented, commented with class and method doc-comments; then zip your *entire project* and upload it to Canvas.

Look on the next page



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Blue: Terminal Window - Project2
Options
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Tax fund:      $      0.00
Donation fund: $      0.00
Dark fund:     $      0.00
ALL FUNDS:     $      0.00

Next...
Which guild are you making a payment for today?   thieves
What was the amount of today's payment? 587.16
What kind of payment - tax or donation? TAX

----- RECEIPT # 122 Wed Feb 08 14:31:05 EST 2023 -----
Guild of Thieves tax payment of $ 500.00 confirmed (5 months).
We're adding the residual $ 87.16 to the donation fund, thank you.

-----
Tax fund:      $      500.00
Donation fund: $      87.16
Dark fund:     $       0.00
ALL FUNDS:     $     587.16

Next...
Which guild are you making a payment for today? SEAMSTRESSes
What was the amount of today's payment? 43.92
What kind of payment - tax or donation? Tax

----- RECEIPT # 356 Wed Feb 08 14:31:23 EST 2023 -----
$ 43.92 is not enough for tax credit.
Thank you for the donation, Guild of Seamstresses.

-----
Tax fund:      $      500.00
Donation fund: $     131.08
Dark fund:     $       0.00
ALL FUNDS:     $     631.08

Next...
Which guild are you making a payment for today? seamstresseS
What was the amount of today's payment? 1102.02
What kind of payment - tax or donation? Tax

----- RECEIPT # 153 Wed Feb 08 14:31:47 EST 2023 -----
Guild of Seamstresses tax payment of $ 1,100.00 confirmed (11 months).
We're adding the residual $ 2.02 to the donation fund, thank you.

-----
Tax fund:      $     1,600.00
Donation fund: $     133.10
Dark fund:     $       0.00
ALL FUNDS:     $     1,733.10

Next...
Which guild are you making a payment for today? aSSaSSinS
What was the amount of today's payment? 2502.10
What kind of payment - tax or donation? tax

----- RECEIPT # 885 Wed Feb 08 14:32:13 EST 2023 -----
Guild of Assassins tax payment of $ 2,500.00 confirmed (2 years 1 months).
We're adding the residual $ 2.10 to the donation fund, thank you.

-----
Tax fund:      $     4,100.00
Donation fund: $     135.20
Dark fund:     $       0.00
ALL FUNDS:     $     4,235.20

Next...
Which guild are you making a payment for today? Haberdashers
What was the amount of today's payment? 122
What kind of payment - tax or donation? tax

----- RECEIPT # 372 Wed Feb 08 14:32:39 EST 2023 -----
To register a new guild, appear in person in front of the Patrician.
We also lost your payment, so please make it again when you register.

-----
Tax fund:      $     4,100.00
Donation fund: $     135.20
Dark fund:     $     122.00
ALL FUNDS:     $     4,357.20

Next...
Which guild are you making a payment for today? thievesS
What was the amount of today's payment? 56.20
What kind of payment - tax or donation? Donation

----- RECEIPT # 738 Wed Feb 08 14:49:11 EST 2023 -----
Guild of Thieves, thank you for your donation,
you have received credit of 2 robberies.

-----
Tax fund:      $     4,100.00
Donation fund: $     191.40
Dark fund:     $     122.00
ALL FUNDS:     $     4,413.40

Next...
Which guild are you making a payment for today? seamstresses
What was the amount of today's payment? 11.50
What kind of payment - tax or donation? donation

----- RECEIPT # 699 Wed Feb 08 14:49:28 EST 2023 -----
Guild of Seamstresses, thank you for your donation,
however, it's not enough for an item of credit.

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Tax fund:      $     4,100.00
Donation fund: $     202.90
Dark fund:     $     122.00
ALL FUNDS:     $     4,424.90

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Next...
Which guild are you making a payment for today? ASSASSINS
What was the amount of today's payment? 60.20
What kind of payment - tax or donation? donation

----- RECEIPT # 008 Wed Feb 08 14:49:49 EST 2023 -----
Guild of Assassins, thank you for your donation,
you have received credit of 1 murders.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     122.00
ALL FUNDS:     $     4,485.10

Next...
Which guild are you making a payment for today? Alchemists
What was the amount of today's payment? 1000
What kind of payment - tax or donation? donation

----- RECEIPT # 368 Wed Feb 08 14:53:37 EST 2023 -----
To register a new guild, appear in person in front of the Patrician.
We also lost your payment, so please make it again when you register.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     1,122.00
ALL FUNDS:     $     5,485.10

Next...
Which guild are you making a payment for today? thieves
What was the amount of today's payment? 0
Invalid payment amount. Yell at someone. Goodbye.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     1,122.00
ALL FUNDS:     $     5,485.10

Next...
Which guild are you making a payment for today? Towncriers
What was the amount of today's payment? -12
Invalid payment amount. Yell at someone. Goodbye.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     1,122.00
ALL FUNDS:     $     5,485.10

Next...
Which guild are you making a payment for today? Assassins
What was the amount of today's payment? 233.64
What kind of payment - tax or donation? goats

----- RECEIPT # 025 Wed Feb 08 15:00:42 EST 2023 -----
Guild of Assassins, we're sorry, we don't take that kind of payment,
so we lost it. Please make the payment again tomorrow, goodbye.

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Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     1,355.64
ALL FUNDS:     $     5,718.74

Next...
Which guild are you making a payment for today? thIEves
What was the amount of today's payment? 16.50
What kind of payment - tax or donation? KEYS

----- RECEIPT # 727 Wed Feb 08 15:02:10 EST 2023 -----
Guild of Thieves, we're sorry, we don't take that kind of payment,
so we lost it. Please make the payment again tomorrow, goodbye.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     1,372.14
ALL FUNDS:     $     5,735.24

Next...
Which guild are you making a payment for today? SEamstresses
What was the amount of today's payment? 1006.12
What kind of payment - tax or donation? lemons

----- RECEIPT # 679 Wed Feb 08 15:02:26 EST 2023 -----
Guild of Seamstresses, we're sorry, we don't take that kind of payment,
so we lost it. Please make the payment again tomorrow, goodbye.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     2,378.26
ALL FUNDS:     $     6,741.36

Next...
Which guild are you making a payment for today? Beggars
What was the amount of today's payment? 1215.08
What kind of payment - tax or donation? cups

----- RECEIPT # 725 Wed Feb 08 15:02:37 EST 2023 -----
To register a new guild, appear in person in front of the Patrician.
We also lost your payment, so please make it again when you register.

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     3,594.14
ALL FUNDS:     $     7,957.24

Next...
Which guild are you making a payment for today? quarrel

-----
Tax fund:      $     4,100.00
Donation fund: $     263.10
Dark fund:     $     3,594.14
ALL FUNDS:     $     7,957.24

We're closed for the day, goodbye.
Can only enter input while your programming is running

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