

**Due Date: 16.11.2025 23:55**

CENG211 – Programming Fundamentals  
Homework #2

In this homework, you are expected to implement a “Scholarship Evaluation System” in Java. You should fulfill the concepts of:

- Inheritance
- Polymorphism
- CSV File/IO
- Array Lists

Every year, a university’s scholarship committee receives hundreds of applications. Each application is unique: some students excel academically, some demonstrate significant financial need, and some contribute through research and publications.

The committee has three main branches handling these cases:

- One branch focuses on **academic excellence** and awards scholarships based on GPA and recommendations.
- Another branch focuses on **financial need**, considering family income and dependents.
- The final branch supports **research activities**, considering publications and supervisor approvals.

Though the criteria differ, all branches follow a **common evaluation framework** — verifying documents, checking eligibility, and assigning the appropriate scholarship type and duration. Your program will act as this evaluation system, automatically reviewing all applicants.

*Hint:*

The evaluation system should be flexible enough to handle different types of applications in the future (e.g., scholarships today, exchange programs tomorrow).

Therefore, you are encouraged to think of a general “Application” framework that scholarship applications can build upon.

## Input File

A single CSV file, ScholarshipApplications.csv, contains all application information. Rows are mixed and not ordered by applicant.

Use the Applicant ID to associate the different parts of an application.

Each row starts with a prefix letter:

Prefix	Meaning	Columns
A	Applicant Info	A, applicantID, name, GPA, income
T	Transcript	T, applicantID, transcriptStatus (Y/N)
I	Family Info	I, applicantID, familyIncome, dependents
D	Document	D, applicantID, documentType, durationInMonths
P	Publication	P, applicantID, title, impactFactor

Applicants are distinguished by their ID prefix:

- **11** → Merit-based Scholarship
- **22** → Need-based Scholarship
- **33** → Research Grant

Each applicant may have several associated documents and publications.

## Document Types

Code	Description
ENR	Enrollment Certificate ( <i>mandatory for all</i> )
REC	Recommendation Letter ( <i>academic merit</i> )
SAV	Savings Document ( <i>financial stability</i> )
RSV	Research Supervisor Approval ( <i>research grant</i> )
GRP	Grant Proposal ( <i>research grant</i> )

## Evaluation Rules for Scholarship

### General Checks (for all applicants)

1. The application must include an **Enrollment Certificate (ENR)**.
2. Transcript status must be **Y (valid)**.
3. GPA must be  $\geq 2.50$ .
4. Missing mandatory information leads to **immediate rejection**.

### Merit-Based Scholarship

1.  $\text{GPA} \geq 3.20 \rightarrow \text{Full Scholarship}$
2.  $3.00 \leq \text{GPA} < 3.20 \rightarrow \text{Half Scholarship}$
3.  $\text{GPA} < 3.00 \rightarrow \text{Rejected}$
4. If a Recommendation Letter (REC) is present, scholarship duration is **2 years**; otherwise **1 year**.

This committee values academic excellence and recognizes recommendations from faculty as an indicator of consistent performance.

### Need-Based Scholarship

1. Monthly income  $\leq 10,000 \rightarrow \text{Full Scholarship}$
2.  $10,000 < \text{income} \leq 15,000 \rightarrow \text{Half Scholarship}$
3.  $\text{Income} > 15,000 \rightarrow \text{Rejected}$
4. If a **Savings Document (SAV)** exists, income thresholds increase by **20%**.
5. If the applicant has **3 or more dependents**, thresholds increase by an additional **10%**.
6. Scholarship duration is **1 year**.

The financial committee prioritizes students who genuinely require financial support but can adapt its evaluation when families demonstrate limited savings or higher dependents.

### Research Grant

1. At least one **Publication (P)** or **Grant Proposal (GRP)** is required.
2. Average **impact factor  $\geq 1.50$**   $\rightarrow \text{Full Scholarship}$
3.  $1.00 \leq \text{avg impact} < 1.50 \rightarrow \text{Half Scholarship}$
4.  $\text{avg impact} < 1.00 \rightarrow \text{Rejected}$
5. If a **Research Supervisor Approval (RSV)** exists, scholarship duration is extended by **+1 year**.
6. Base duration: Full  $\rightarrow 1 \text{ year}$ , Half  $\rightarrow 6 \text{ months}$ .

The research branch awards grants based on scientific contribution and supervisor validation. Outstanding research performance ensures longer support.

## Rejection Reasons (priority order)

If multiple rejection reasons apply, only the **first relevant one** is printed:

1. Missing Enrollment Certificate
2. Missing Transcript
3. GPA below 2.5
4. Missing mandatory document
5. Financial status unstable
6. Missing publication or proposal
7. Publication impact too low

## Expected Output Format:

Applicant ID: 1101, Name: Liam Smith, Scholarship: Merit, Status: Accepted, Type: Full, Duration: 2 years

Applicant ID: 1114, Name: Ava Johnson, Scholarship: Merit, Status: Accepted, Type: Half, Duration: 1 year

Applicant ID: 1120, Name: Oliver Brown, Scholarship: Merit, Status: Rejected, Reason: GPA below 3.0

Applications must be printed **sorted by Applicant ID**.

## Important Notes:

1. You can use standard java.io packages to read files. Do NOT use other 3rd party libraries.
2. You should use **relative** paths (e.g. Files/sample.csv) instead of **absolute** paths (e.g. C:\\user\\eclipse-workspace\\MyProject\\Files\\sample.csv). Please be sure of it, otherwise there will be **no output** of your application and you certainly will **lose points**.
3. To support **Turkish characters**, you may need to change your project's text file encoding to UTF8: Right click on your project (in package explorer) → Properties → Text file encoding → Other → UTF8 → Apply.
4. You are expected to write clean, readable, and tester-friendly code. Please try to maximize reusability and prevent from redundancy in your methods.

## Assignment Rules:

1. In this lecture's homework, there are no cheating allowed. If any cheating has been detected, they will be graded as 0 and there will be no further discussion on this.
2. You are expected to submit your homework in groups. Therefore, only one of you will be sufficient to submit your homework.
3. Make sure you export your homework as an Eclipse project. You can use other IDEs as well, however, you must test if it **can be executed** in Eclipse.
4. Submit your homework through Teams.
5. Your exported Java Project should have the following naming format with your assigned group ID as the given below:

**G05\_CENG211\_HW2**

Also the zip folder that your project in should have the same name

**G05\_CENG211\_HW2.zip**

6. Please beware that if you do not follow the assignment rules for exporting and naming conventions, you will lose points.

7. Please be informed that your submissions may be anonymously used in software testing and maintenance research studies. Your names and student IDs will be replaced with non-identifying strings. If you do not want your submissions to be used in research studies, please inform the instructor (Dr. Tuglular) via e-mail.