**Course Project Specification**

Description of problem:

My course project is a program that represents the collection of a bookstore in Blagoevgrad. The store offers various genres of books, including best-sellers and literary classics. The main feature of the program is the advanced search algorithm that can help users in finding the most suitable book for their specific needs. It takes into account the occasion for which the book is needed (vacation, leisure at home, schoolwork, etc.), the genres that the user generally likes, and the hobbies and personal interests of the reader (e.g. if the reader is a football fan, it is likely they will enjoy sport-related books).

Hierarchy of the classes:

Graphical user interface, application

Description automatically generated

The three-level hierarchy above will be used to classify the books according to genres.

Polymorphic function:

The search algorithm which finds the best books is implemented with a polymorphic function. It has the following signature: *int Search(SearchCriteria).* The function takes as input a structure that represents all important criteria for choosing a book: age, gender, hobbies, context, personal interests, preferences for genre, etc. As output, it returns an integer number from 0-100. This is the estimated “grade” of the book, evaluated with respect to the reader’s specific preferences. The higher the grade, the more likely that the user enjoys the given book. The function has different logic based on what type of book it is applied to. For example, choosing an encyclopedic book highly depends on the context (does the reader need it for school or work, or simply for gaining knowledge?), and so the specific context will have a significant impact on the final grade, whereas the gender of the person is irrelevant in this case. On the other hand, enjoyment of romance books is linked to the gender and age of the person. This is because romantic novels are statistically more likely to be read by either females or teenagers. Tendencies such as the ones mentioned and many more are reflected in the different implementations of the function.

Object collection update and use:

A vector of pointers to type *Book* represents the collection of books in the bookstore. The user is asked to input all their characteristics and preferences. The polymorphic function is then applied to all available books to find the best matches. Then, the function *void SortByGrade(vector<Book\*>)* is called with the vector of books as an argument. It uses the merge sort algorithm to sort the books in the vector by grade in a descending order (from highest grade to lowest grade). Finally, the characteristics (name, price, author, etc.) of the five best books are presented to the user.