STUDY GUIDE
SOFTWARE DEVELOPMENT (JAVA)
SWD412
SAQA ID: 78965

2024

CTU training solutions
Creative & Technology Universitas

Table of Contents

Software Development (SWD412)

1. How to use this guide

The guide provides an overview of the syllabus and the learning outcomes of the module. It will indicate each major topic that will be covered, as well as the learning outcomes of each topic.

The study guide is NOT a replacement of textbooks and should be studied in conjunction with the required textbooks.

The following icons will be used in the study guide:


Sections in the prescribed textbook that the student needs to study


Additional reading that the student needs to study


Video that the student needs to watch


Activities to be completed


Exercises to be completed


Group activities to be completed


Projects to be completed


Tests to be completed


Revision questions to be completed

2. Introduction

By combining UI design skills with Java programming, students open doors to exciting career paths that involve both designing and implementing intuitive user interfaces. Java's popularity in the industry ensures a wide range of opportunities for UI designers, allowing them to work on projects that require seamless integration of design and functionality. As a UI design student, learning Java equips you with the tools and knowledge to create captivating interfaces, collaborate with software developers, and deliver exceptional user experiences across different platforms and applications. Whether it's designing for web, mobile, or enterprise systems, Java empowers UI design students to make a significant impact in the software development field.

2.1. Department Information

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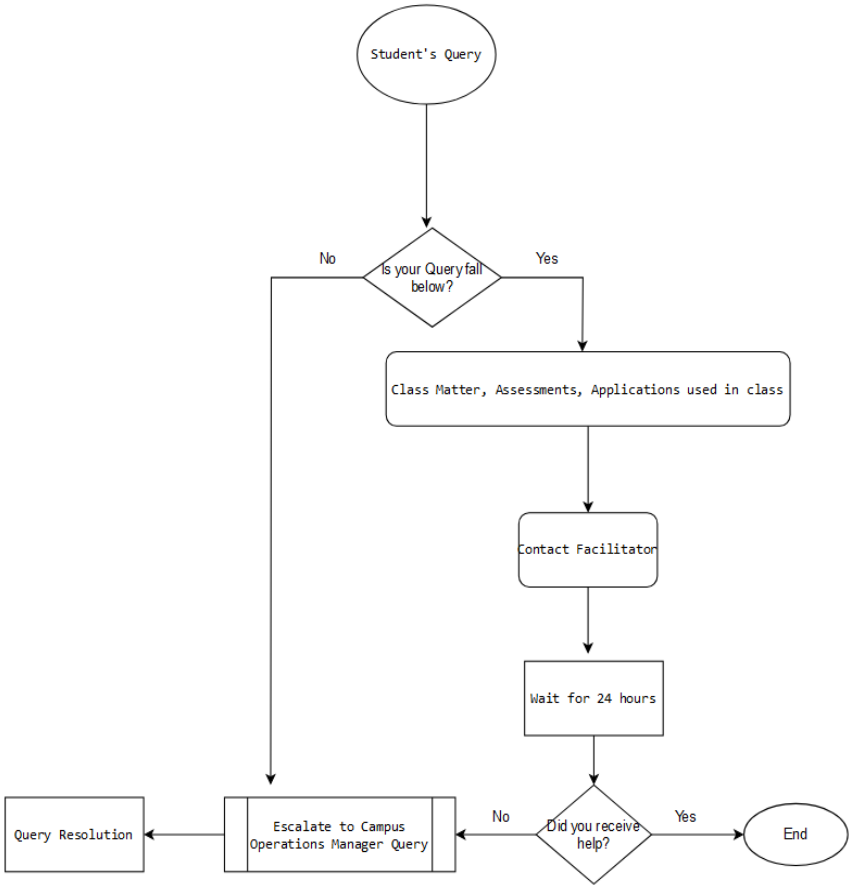
2.2. Query Resolution Structure



3. Purpose of the Module

The purpose of this module is to provide students with practical knowledge of Java which is a valuable programming language for UI design students, as it combines the power of software development with the ability to create visually appealing user interfaces.

3.1. Contact Hours and Indicative Student Workload

Proposed Roll Out Strategy	Credits	Total Notional Hours	Theory	Practical	Contact Sessions	Formative Assessments	Summative Assessments
22 July to 22 November 2024	15	150					

3.2. Unit Standards

- Apply problem solving strategies.
- Describe the difference between programming in Object Orientated and Procedural Languages.
- Explain how data is stored on computers.

3.3. Learning Outcomes

- Demonstrate a working knowledge of Software Development Languages.
- Use industry standard software to execute design ideas.
- Create and manipulate applications.
- Create final products for publication.

3.4. Credits: 15

3.5. NQF: 4

4. Teaching and Learning Methods

Lectures, Flipped Classroom, Webinars, Group and Research, practical classes (role play), and Gamification.

4.1. Module Resources

- Student module manual referencing a variety of sources.
- Online sources for research purposes.
- Traditional art media for conceptual development

4.2. Internet Requirements

A device and a minimum of 20GB data are required to access training material.

4.3. Prescribed reading

Gazihan Alankus, Rogerio Theodoro de Brito, Basheer Ahamed Fazal, Vinicius Isola, Miles Obare(2019). Java Fundamentals. Available on Safari Books Online at

Java Fundamentals (oreilly.com)

4.4. Additional reading

Java | Definition & Facts | Britannica. (2023). In: Encyclopædia Britannica. [online] Available at: https://www.britannica.com/technology/Java-computer-programming-language [Accessed 5 Jul. 2023].

Apache NetBeans (2017). Welcome to Apache NetBeans. [online] Apache.org. Available at: https://netbeans.apache.org/ [Accessed 5 Jul. 2023].

W3schools.com. (2023). Java Variables. [online] Available at: https://www.w3schools.com/java/java_variables.asp [Accessed 5 Jul. 2023].

team, edX (2022).

5 Reasons to Learn Java Programming. [online] Edx.org. Available at: https://blog.edx.org/5-reasons-to-learn-java-programming#:~:text=Java%20is%20fairly%20easy%20to,learning%20Java%20is%20generally%20beneficial. [Accessed 5 Jul. 2023].

https://learn.oracle.com/ols/learning-path/java-fundamentals/55593/55578#:~:text=In%20this%20course%2C%20you%20learn,base%20continued%20work%20and%20training

www.javatpoint.com. (2021). Java OOPs Concepts - Javatpoint. [online] Available at: https://www.javatpoint.com/java-oops-concepts [Accessed 5 Jul. 2023].

Elliott, E. (2018). The Forgotten History of OOP - JavaScript Scene - Medium. [online] Medium. Available at: https://medium.com/javascript-scene/the-forgotten-history-of-oop-88d71b9b2d9f [Accessed 5 Jul. 2023].

Torres, E. (2021). Java Tip: What are Methods, Functions, and Procedures? [online] DEV Community. Available at: https://dev.to/realedwintorres/java-tip-what-are-methods-functions-and-procedures-4nfm [Accessed 10 Jul. 2023].

GeeksforGeeks. (2022). Difference Between Function and Method. [online] Available at: https://www.geeksforgeeks.org/difference-between-function-and-method/ [Accessed 10 Jul. 2023].

Tutorjoes.in. (2023). Form Design Using Java AWT. [online] Available at: https://www.tutorjoes.in/java_programming_tutorial/awt_registration_form_design_using_java [Accessed 11 Jul. 2023].

GeeksforGeeks. (2019). Java Swing Simple User Registration Form. [online] Available at: https://www.geeksforgeeks.org/java-swing-simple-user-registration-form/ [Accessed 11 Jul. 2023].

Tutorialspoint.com. (2023). AWT Image Class. [online] Available at: https://www.tutorialspoint.com/awt/awt_image.htm [Accessed 12 Jul. 2023].

www.javatpoint.com. (2021). Java Image - Javatpoint. [online] Available at: https://www.javatpoint.com/java-image [Accessed 12 Jul. 2023].

Tutorialspoint.com. (2023). AWT Event Listeners. [online] Available at: https://www.tutorialspoint.com/awt/awt_event_listeners.htm [Accessed 12 Jul. 2023].

Dotnettutorials.net. (2023). Available at: https://dotnettutorials.net/lesson/event-listener-interfaces-in-java/ [Accessed 12 Jul. 2023].

https://www.facebook.com/BrainKart-678754188988648 (2017). Event Listener Interfaces - Java. [online] BrainKart. Available at: https://www.brainkart.com/article/Event-Listener-Interfaces---Java_10640/ [Accessed 12 Jul. 2023].

5. Assessment Details

The students will need a pass mark of 80% on the preliminary exam to qualify for admission to the international certification exams.

5.1. Formative Assessment Breakdown

Formative 1	Formative 2
Practical Project 1 + Test 1	Practical Project 2 + Test 2
Client Website	Online Portfolio
25%	25%

5.2. Summative Assessment

Practical exam
50%

Formative assessments (50%) + Summative assessment (50%) = Final mark

5.3. Assessment Preparation Guidelines

Assessment	Format of the Assessment	Resources required	Learning Units Covered
Formative Assessment 1:	The project will consist of specification on creating a GUI system that captures, stores and displays user input with given conditions.	Access to: • Access to online sources for research purposes.	• Define and analyse the problem. • Evaluate solutions • Implement the solution. • Describe basic object oriented terminology • Describe the fundamental differences between procedural and object oriented programming

Assessment	Format of the Assessment	Resources required	Learning Units Covered
Formative Assessment 2:	The project will consist of specification on creating a GUI system that captures, stores and displays user input with given conditions alongside displaying functionality and media sources.	Access to: • Access to online sources for research purposes.	• Define and analyse the problem. • Evaluate solutions • Implement the solution. • Describe basic object oriented terminology • Describe the fundamental differences between procedural and object oriented programming
Summative Assessment:	The exam will be completed as a practical project over a specified period. All requirements will be specified on the exam brief to be handed out to students on the scheduled exam date.	Access to: • Access to online sources for research purposes.	• Define and analyse the problem. • Evaluate solutions • Implement the solution. • Describe basic object oriented terminology • Describe the fundamental differences between procedural and object oriented programming

5.4. Assessment Release and Submission Week

The students will need a mark of 70% for each Formative to be deemed Competent.

Please note – There are two (2) steps in the submission process.

- Step 1: Required evidence in the specified formats is submitted on Campus Online to the designated assignment description. NB!!! It is your responsibility to ensure that you submit in the right slot.
- Step 2: Complete and submit the document of authenticity for every formative and summative assessment submitted.

5.5. Assessment Strategy

The following assessment activities apply to each module:

- Knowledge assessments

- Practical / Research Assignments
- CCFOs (Critical Cross-Field Outcomes) / Simulated case studies
- Work Integrated Logbooks

5.6. Formative Assessment Submissions

Formative Assessment:	Release Date:	Submission:
Formative Assessment 1	**Project:** 12 August 2024 **Test:** 05 September 2024	**Project:** 06 September 2024 **Test:** 05 September 2024
Formative Assessment 2	**Project:** 09 September 2024 **Test:** 10 October 2024	**Project:** 11 October 2024 **Test:** 10 October 2024

5.7. Summative Assessment Submission

Summative Assessment:	Release Date:	Submission:
Practical Examination	11 November 2024	22 November 2024

5.8. International Exams

International Exam:	Bootcamp, International Exam Preparation and Prelims:	International Exam:
NA	NA	NA

6. Progression

Projects that need to be completed and submitted for this module are set up to simulate the design process as applied in the industry. Each project description includes a guideline indicating phases in the project. These phases as indicated serve as a guide to assist in your planning and implementation of activities to ensure adherence to project deadlines. The projects in general span over several weeks and sessions are indicated in your lesson plan. You will be required to present specified evidence during each session. During these consultation sessions, you will receive feedback from the facilitator that should indicate additional development or alternative directions. Your ability to act on these directions is assessed under the assessment criteria of 'progress'.

You will be required to spend additional time outside of scheduled classes to successfully develop and complete assignments.

7. Week Planner

SEMESTER 2	
22-26/07/2024	Week 1
29/07-02/08/2024	Week 2
05-09/08/2024	Week 3
12-16/08/2024	Week 4
19-23/08/2024	Week 5
26-30/08/2024	Week 6
02-06/09/2024	Week 7
09-13/09/2024	Week 8
16-20/09/2024	Week 9
23-27/09/2024	Student Holiday
30/09-04/10/2024	Week 10
07-11/10/2024	Week 11
14-18/10/2024	Week 12 International Exam Preparation and Prelims
21-25/10/2024	Week 13 International Exam Preparation and Prelims
28/10-01/11/2024	Week 14 2nd Semester International Exams
04-08/11/2024	Week 15 Exam Preparation
11-15/11/2024	Exam Week 1
18-22/11/2024	Exam Week 2
25/11/2024	Student Holiday Starts

8. Lesson Plan

Semester 2			
Week	**Learning Units to be Covered**	**Resources required**	**Class Activity**
Week 1	Introduction to Semester 2	Study Guide Access to O'Reilly Books Online	Account activation and resource download
Week 2	Introduction to Software Development (JAVA)	Online sources for research purposes Microsoft 365	
Week 3	Learning Unit 1: Getting Started	Students to install necessary software and resources to run java and java AWT Access to: Internet Access Minimum 20GB storage space Java: https://www.oracle.com/za/java/technologies/downloads/ NetBeans: https://netbeans.apache.org/download/index.html	Practical Class: Installing Java Installing NetBeans Going through the interface Customizations Root folders and project setups Saving and executing
	Learning Unit 2: Getting to know the basics	Getting the fundamentals for java sorted is the first step towards building UIs https://www.javatpoint.com/java-variables https://www.tutorialspoint.com/java/java_basic_syntax.htm https://docs.oracle.com/javase/tutorial/	Practical Class: Variables Data Types Imports Functions Print Loops Main Method Class & Objects
Week 4	Learning Unit 3: First Steps	With the fundamentals in the pocket it is time to take a gear up and start focussing in more advanced concepts https://www.javatpoint.com/java-oops-concepts https://beginnersbook.com/2013/05/java-arrays/	Practical Class: Encapsulation Inheritance Polymorphism Constructor and Methods Arrays

Semester 2			
Week	**Learning Units to be Covered**	**Resources required**	**Class Activity**
	Learning Unit 4: First Marathon	Time to put all this knowledge to the test and create our first proper program: Console based Allows input and output Uses classes and functions Methods and inheritance Calculations & functions A good example: https://www.geeksforgeeks.org/calculate-speed-distance-time/	Practical Class: Class activity 1 Project 1: Hand Out
Week 5	Learning Unit 5: Facing the GUI Learning Unit 6: Capture, Store, Display	Students are introduced to Java AWT and the basic setup of a project. https://www.tutorialspoint.com/awt/awt_overview.htm Students will tackle capturing, storing and displaying data https://www.tutorialspoint.com/awt/awt_event_handling.htm	Practical Class: Importing AWT Setting up windows Window Settings Fields and data types Buttons Input Event Handling
Week 6	Learning Unit 7: Buttons & Functions	The next step in the journey will be using the GUI and adding functionality from buttons to displaying under certain conditions https://www.javatpoint.com/java-awt-button https://www.javatpoint.com/event-handling-in-java https://www.javatpoint.com/java-awt-menuitem-and-menu	Practical Class: Linking functions to buttons Implementing functions to fields Capturing data externally Using buttons to navigate between windows Menu's
Week 7	FA1 – Project Submission FA1 - Test		

Semester 2			
Week	**Learning Units to be Covered**	**Resources required**	**Class Activity**
Week 8	Learning Unit 8: Forms and Features	Form handling and data capture is a part of IT in general from here students will learn basic form fields and form handling https://www.javatpoint.com/java-awt-textfield https://www.javatpoint.com/java-awt-textarea https://www.javatpoint.com/java-awt-checkbox https://www.javatpoint.com/java-awt-checkboxgroup https://www.javatpoint.com/java-awt-choice https://www.javatpoint.com/java-awt-list https://www.javatpoint.com/java-awt-scrollbar	Practical Class: Text fields Text Areas Checkboxes Groups Lists Scrolling Drop-down Class Activity 2 Project 2: Hand Out
Week 9	Learning Unit 9: Media & Design	Adding media to apps and UIs is what makes is stand out in the industry, from here we will link all types of media and icons https://www.codespeedy.com/how-to-add-an-image-in-jframe/ https://coderanch.com/t/667697/java/Embed-Video-JFrame https://www.tutorialspoint.com/how-to-add-icon-to-jbutton-in-java#:~:text=To%20add%20icon%20to%20a,an%20image%20to%20the%20button.&text=Icon%20icon%20%3D%20new%20ImageIcon(%22,button7%20%3D%20new%20JButton(icon)%3B	Practical Class: Images Videos Icons Files Import/Export

Semester 2			
Week	**Learning Units to be Covered**	**Resources required**	**Class Activity**
Week 10	Learning Unit 10: Listeners & Conditions	Listeners and events help determine variables, functions and certain conditions & calculations to take place https://www.javatpoint.com/java-actionlistener https://www.javatpoint.com/java-mouselistener https://www.javatpoint.com/java-mousemotionlistener https://www.javatpoint.com/java-itemlistener https://www.javatpoint.com/java-windowlistener	Practical Class: Action listener Mouse Listener Mouse Motions Item Listener Window Listener
Week 11	FA2 – Project Submission FA2 - Test		
Week 12	International Examination Bootcamp and Prelim Week		
Week 13	Prelim Week		
Week 14	International Examination		
Week 15	National Examination Preparation		
Week 16	Summative Assessments		
Week 17	Summative Assessments		

8.1. Module Content

LEARNING UNIT 1: GETTING STARTED

Introduction

Java is a widely-used programming language for coding web applications. It has been a popular choice among developers for over two decades, with millions of Java applications in use today. Java is a multi-platform, object-oriented, and network-centric language that can be used as a platform in itself. It is a fast, secure, reliable programming language for coding everything from mobile apps and enterprise software to big data applications and server-side technologies.

Prescribed reading

Java.com. (2023). Available at: https://www.java.com/en/download/help/whatis_java.html [Accessed 5 Jul. 2023].

Java | Definition & Facts | Britannica. (2023). In: Encyclopædia Britannica. [online] Available at: https://www.britannica.com/technology/Java-computer-programming-language [Accessed 5 Jul. 2023].

Apache NetBeans (2017). Welcome to Apache NetBeans. [online] Apache.org. Available at: https://netbeans.apache.org/ [Accessed 5 Jul. 2023].

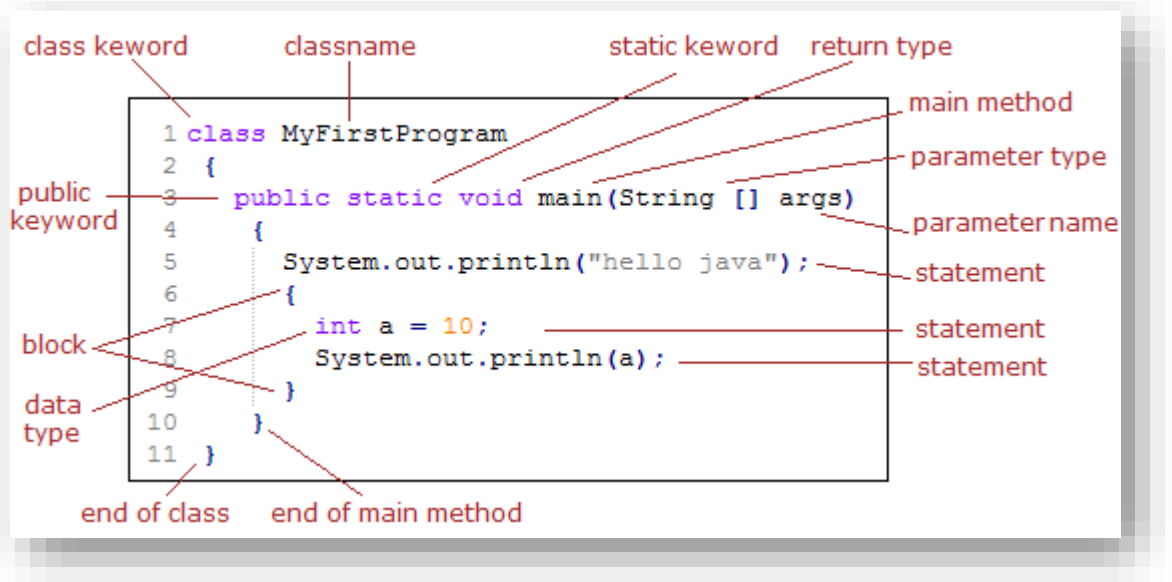
Learning outcomes

- Learn what is Java
- Learn to install Java
- Learn what is NetBeans
- Install NetBeans
- Learn project/root folder concepts

Revision Questions

1. What is Java?
2. Why do we use NetBeans?
3. How does java run on your pc?
4. Is java relevant in today's industry?
5. Where is java most widely used?
6. What is a root/project folder?
7. Provide a screenshot of you creating a 'Hello, World!' application

LEARNING UNIT 2: GETTING TO KNOW THE BASICS



Introduction

Java is an object Oriented Programming (OOP) language. It incorporates almost every OOP features.

Prescribed reading

W3schools.com. (2023). Java Variables. [online] Available at: https://www.w3schools.com/java/java_variables.asp [Accessed 5 Jul. 2023].

team, edX (2022). 5 Reasons to Learn Java Programming. [online] Edx.org. Available at: https://blog.edx.org/5-reasons-to-learn-java-programming#:~:text=Java%20is%20fairly%20easy%20to,learning%20Java%20is%20generally%20beneficial. [Accessed 5 Jul. 2023].

https://learn.oracle.com/ols/learning-path/java-fundamentals/55593/55578#:~:text=In%20this%20course%2C%20you%20learn,base%20continued%20work%20and%20training

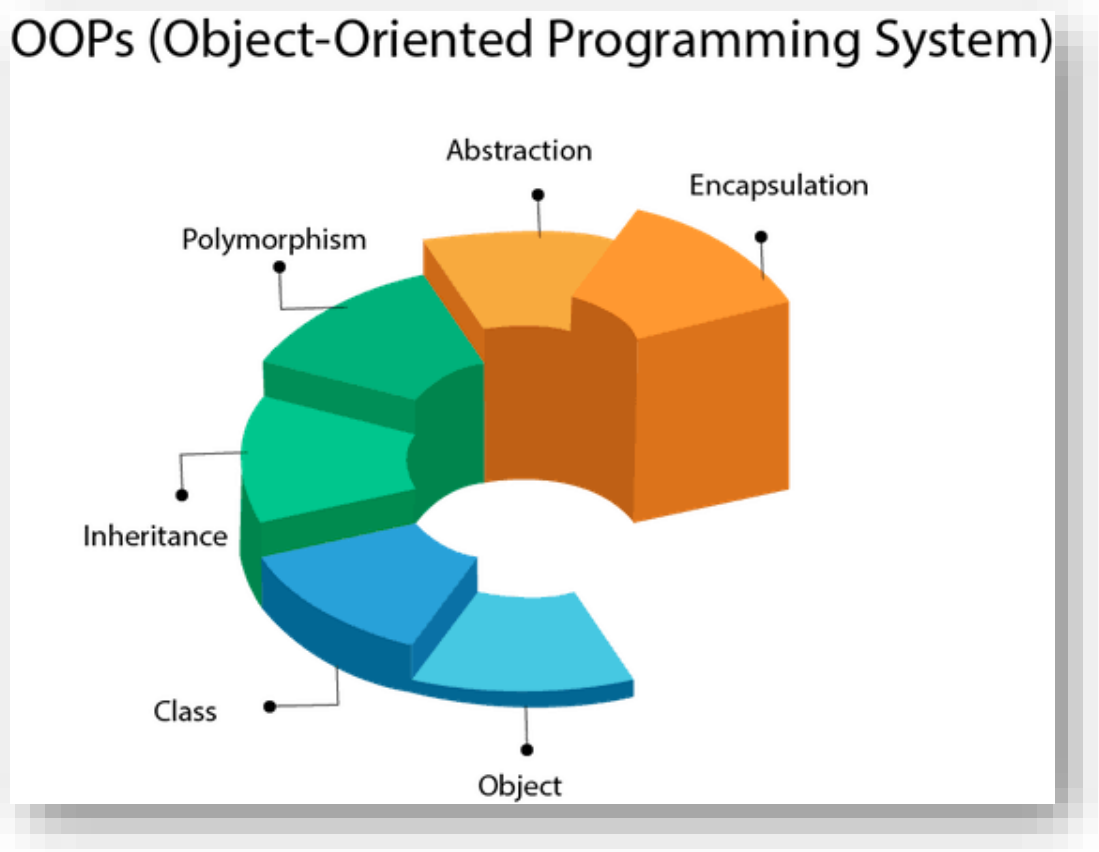
Learning outcomes

- Variables
- Data Types
- Imports
- Functions
- Print
- Loops
- Main Method
- Class & Objects

Revision Questions

1. Explain what are variables used for?
2. Which datatypes are used more commonly in each application?
3. Why do we import a print method?
4. What is the difference between a method and function?
5. Where are classes used and where will objects be used?

LEARNING UNIT 3: FIRST STEPS



Introduction

Object means a real-world entity such as a pen, chair, table, computer, watch, etc. Object-Oriented Programming is a methodology or paradigm to design a program using classes and objects. It simplifies software development and maintenance by providing some concepts

Prescribed reading

www.javatpoint.com. (2021). Java OOPs Concepts - Javatpoint. [online] Available at: https://www.javatpoint.com/java-oops-concepts [Accessed 5 Jul. 2023].

Elliott, E. (2018). The Forgotten History of OOP - JavaScript Scene - Medium. [online] Medium. Available at: https://medium.com/javascript-scene/the-forgotten-history-of-oop-88d71b9b2d9f [Accessed 5 Jul. 2023].

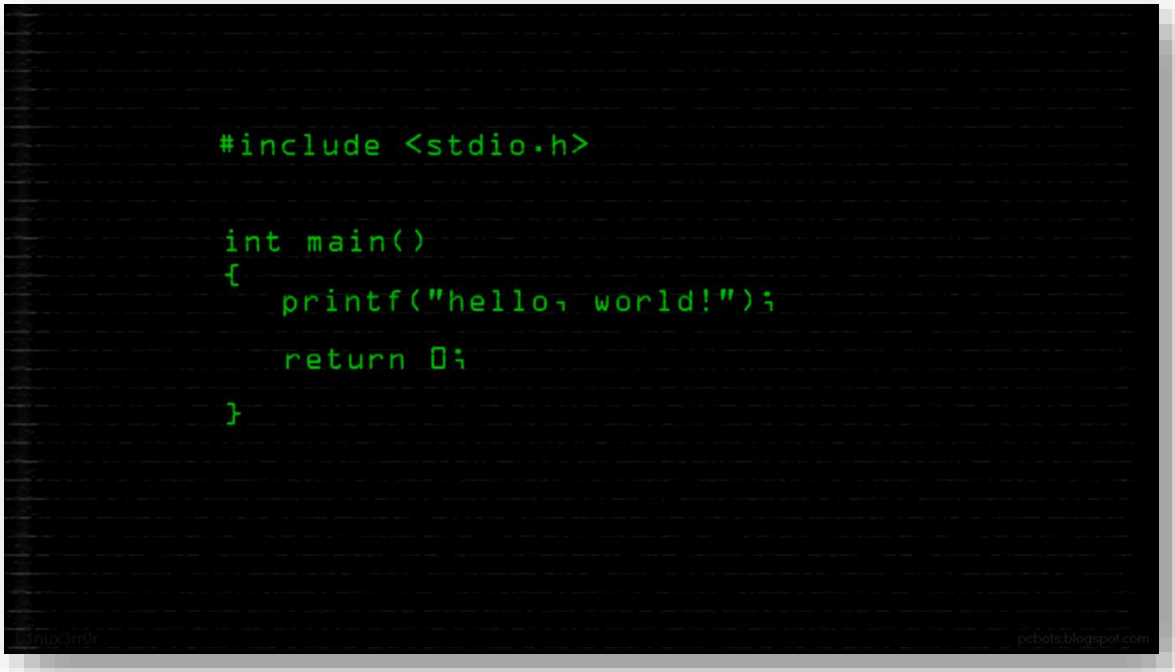
Learning outcomes

- Encapsulation
- Inheritance
- Polymorphism
- Constructor and Methods
- Arrays

Revision Questions

1. What is encapsulation?
2. Why would you use inheritance in an application?
3. Explain the difference between inheritance and polymorphism?
4. Why is the constructor important?
5. What are arrays used for?
6. Name an application that uses arrays
7. What is OOP?
8. Why is OOP a preferred coding method?

LEARNING UNIT 4: FIRST MARATHON



Introduction

The BMI is a widely used measurement to assess an individual's body weight in relation to their height. By calculating the BMI, we can determine whether a person is underweight, normal weight, overweight, or obese.

Prescribed reading

Torres, E. (2021). Java Tip: What are Methods, Functions, and Procedures? [online] DEV Community. Available at: https://dev.to/realedwintorres/java-tip-what-are-methods-functions-and-procedures-4nfm [Accessed 10 Jul. 2023].

GeeksforGeeks. (2022). Difference Between Function and Method. [online] Available at: https://www.geeksforgeeks.org/difference-between-function-and-method/ [Accessed 10 Jul. 2023].

Learning outcomes

- Console based
- Input and output
- Classes and functions
- Methods and inheritance
- Calculations & functions

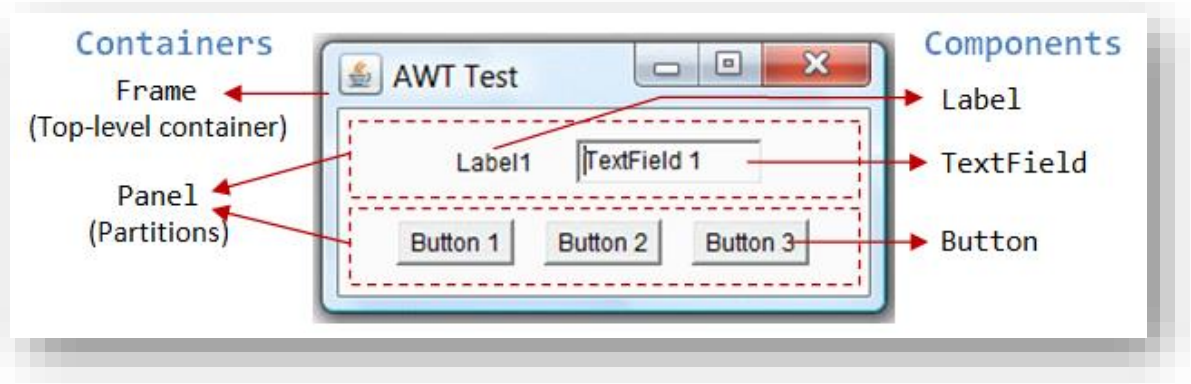
Class Activity 1

It's time to put all this knowledge to the test and create our first real program.
BMI stands for Body Mass Index. This is a value derived from a person's height and weight. With BMI, you can know if a person's weight is healthy or not.

Let's take a look at the formula for calculating BMI:
BMI = Weight (kg) / (Height (meter) * Height (meter)

The BMI is a widely used measurement to assess an individual's body weight in relation to their height. By calculating the BMI, we can determine whether a person is underweight, normal weight, overweight, or obese.
To complete this task, you will need to implement a program that takes inputs for a person's weight and height, and then calculates and displays their BMI value. The BMI formula involves dividing the weight in kilograms by the square of the height in meters. Once the BMI value is calculated, it should be categorized into one of the predefined weight categories, such as underweight, normal weight, overweight, or obese.
This task will not only help you practice Java programming concepts, but also provide a practical application of mathematical calculations and conditional statements. You will need to handle user input, perform mathematical operations, and use conditional statements to determine the weight category based on the calculated BMI value.
Remember to ensure that your program handles any potential errors or invalid input gracefully, such as validating that the user enters positive numeric values for weight and height.

LEARNING UNIT 5: FACING THE GUI



Introduction

Java AWT (Abstract Window Toolkit) is an API to develop GUI or window-based applications in java. Java AWT components are platform-dependent i.e. components are displayed according to the view of operating system. AWT is heavyweight i.e. its components are using the resources of OS.
A Window object is a top-level window with no borders and no menubar. The default layout for a window is BorderLayout . A window must have either a frame, dialog, or another window defined as its owner when it's constructed.

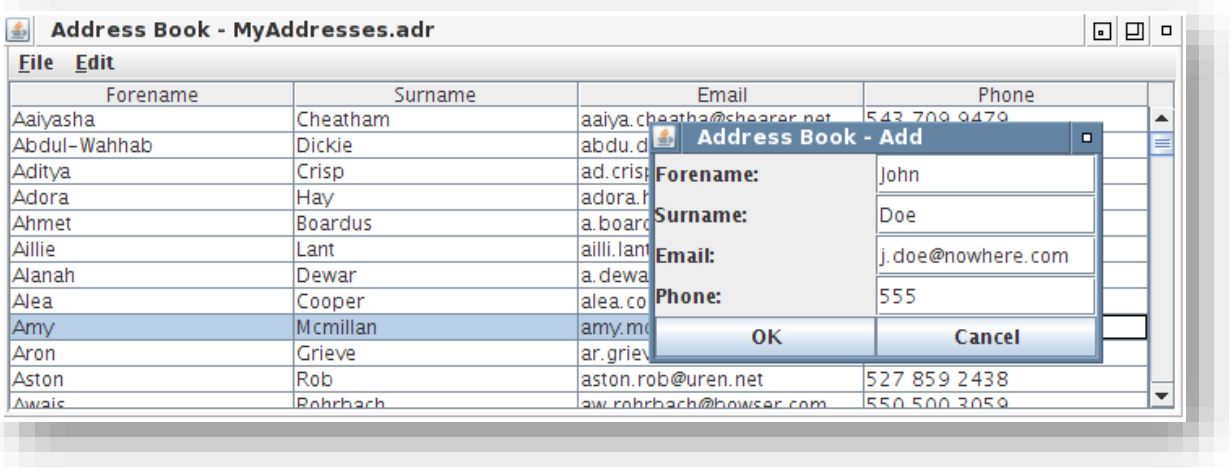
Prescribed reading

Oreilly.com. (2023). Java AWT Reference: In PDF Format. [online] Available at: https://www.oreilly.com/openbook/javawt/book/ [Accessed 11 Jul. 2023].

Revision Questions

1. What is java AWT?
2. How do you import java AWT?
3. Explain the following terminologies:
    a. Window
    b. Panel
    c. Frame
4. What is a constructor?

LEARNING UNIT 6: CAPTURE, STORE, DISPLAY



Introduction

Java AWT (Abstract Window Toolkit) is a powerful library that allows developers to create graphical user interfaces (GUI) for their Java applications. One of the essential tasks in GUI programming is capturing data input from users. Whether it's a text field, checkbox, or button click, Java AWT provides a comprehensive set of tools and components to facilitate data capture and interaction. By leveraging the rich functionality of Java AWT, developers can create intuitive and user-friendly interfaces that enable efficient and accurate data collection. In this paragraph, we will explore the fundamentals of capturing data in Java AWT, including event handling, listeners, and component interactions, which form the building blocks for creating dynamic and interactive applications.

Prescribed reading

www.javatpoint.com. (2021). Java AWT Button - javatpoint. [online] Available at: https://www.javatpoint.com/java-awt-button [Accessed 11 Jul. 2023].
www.javatpoint.com. (2021). Java AWT Label - javatpoint. [online] Available at: https://www.javatpoint.com/java-awt-label [Accessed 11 Jul. 2023].
www.javatpoint.com. (2021). Java AWT TextField - javatpoint. [online] Available at: https://www.javatpoint.com/java-awt-textfield [Accessed 11 Jul. 2023].

Learning outcomes

- Importing AWT
- Setting up windows
- Window Settings
- Fields and data types
- Buttons
- Input
- Event Handling

Revision Questions

1. Explain the following terminologies:
    a. Textfield
    b. Object
    c. Component
    d. Public class
    e. Extends
    f. TextComponent
    g. setLayout
    h. setBounds

LEARNING UNIT 7: BUTTONS & FUNCTIONS

Introduction

In Java, functions, also known as methods, are reusable blocks of code that perform specific tasks. They are defined using a syntax that includes an access modifier, return type, method name, and optional parameter list. The access modifier determines the visibility of the method, such as public, private, or protected. The return type specifies the type of value the method returns, or void if it doesn't return anything. The method name is used to call and execute the method. Parameters can be passed to the method, allowing it to receive input values. Functions are essential for organizing code into logical units, improving readability, and facilitating code reusability.

Prescribed reading

www.javatpoint.com. (2021). Java AWT Button - javatpoint. [online] Available at: https://www.javatpoint.com/java-awt-button [Accessed 11 Jul. 2023].
Tutorialspoint.com. (2023). AWT Controls. [online] Available at: https://www.tutorialspoint.com/awt/awt_controls.htm#:~:text=A%20Choice%20control%20is%20used,the%20top%20of%20the%20menu.&text=A%20Canvas%20control%20represents%20a,receive%20inputs%20created%20by%20user.&text=An%20Image%20control%20is%20superclass%20for%20all%20image%20classes%20representing%20graphical%20images. [Accessed 11 Jul. 2023].

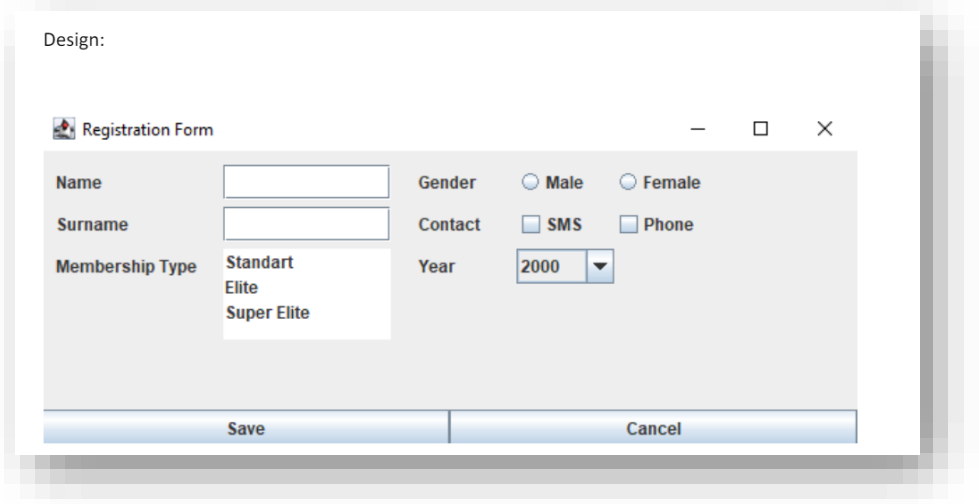
Learning outcomes

- Linking functions to buttons
- Implementing functions to fields
- Capturing data externally
- Using buttons to navigate between windows
- Menu’s

Revision Exercise

1. Create a window
2. Add a button
3. Create a second window
4. Add the functionality required for the button to open the second video

LEARNING UNIT 8: FORMS & FEATURES



Introduction

Java AWT (Abstract Window Toolkit) forms provide a powerful means of creating graphical user interfaces (GUIs) in Java applications. AWT forms allow developers to design and build interactive windows, dialogs, buttons, text fields, checkboxes, and other GUI components. These forms enable users to interact with the program by inputting data, making selections, and triggering actions. AWT forms are based on a component hierarchy, where containers like frames and panels can hold and arrange other components. With the AWT library, developers can create visually appealing and user-friendly interfaces for their Java applications, enhancing the overall user experience.

Prescribed reading

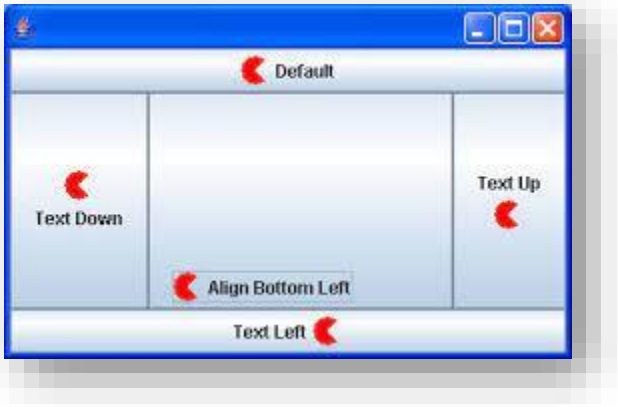
Tutorjoes.in. (2023). Form Design Using Java AWT. [online] Available at: https://www.tutorjoes.in/java_programming_tutorial/awt_registration_form_design_using_java [Accessed 11 Jul. 2023].
GeeksforGeeks. (2019). Java Swing Simple User Registration Form. [online] Available at: https://www.geeksforgeeks.org/java-swing-simple-user-registration-form/ [Accessed 11 Jul. 2023].

Learning outcomes

- Text fields
- Text Areas
- Checkboxes
- Groups
- Lists
- Scrolling
- Drop-down

Class Activity 2
Create a simple registration form layout that utilizes each form component in java AWT.

LEARNING UNIT 9: MEDIA & DESIGN



Introduction

The `Image` class in Java serves as an abstract superclass that provides a foundation for all other classes involved in graphical image representation. It encapsulates common functionality and attributes related to images, allowing for code reuse and abstraction. By extending this class, developers can create specialized classes tailored to specific image types, such as raster or vector graphics. The `Image` class sets a standard interface and defines essential methods and properties required for image manipulation, such as loading, displaying, resizing, and applying transformations. This abstraction simplifies the development process and promotes modularity, enabling Java applications to handle various image formats and operations efficiently.

Prescribed reading

Tutorialspoint.com. (2023). AWT Image Class. [online] Available at: https://www.tutorialspoint.com/awt/awt_image.htm [Accessed 12 Jul. 2023].

www.javatpoint.com. (2021). Java Image - Javatpoint. [online] Available at: https://www.javatpoint.com/java-image [Accessed 12 Jul. 2023].

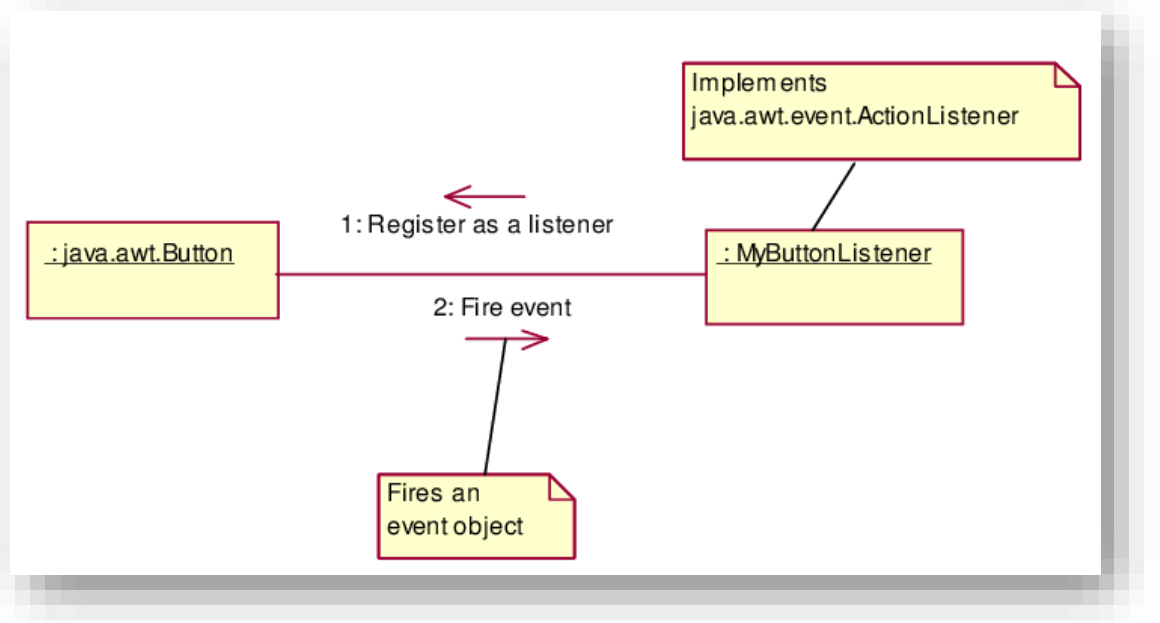
Learning outcomes

- Images
- Videos
- Icons
- Files
- Import/Export

Revision Questions

1. Explain in detail what an image class is?
2. What is an abstract class?
3. Explain the following code: abstract Graphics getGraphics()
4. How do you resize images in java AWT?

LEARNING UNIT 10: LISTENERS & CONDITIONS



Introduction

The Event listener represent the interfaces responsible to handle events. Java provides us various Event listener classes but we will discuss those which are more frequently used. Every method of an event listener method has a single argument as an object which is subclass of EventObject class. For example, mouse event listener methods will accept instance of MouseEvent, where MouseEvent derives from EventObject.

Prescribed reading

Tutorialspoint.com. (2023). AWT Event Listeners. [online] Available at: https://www.tutorialspoint.com/awt/awt_event_listeners.htm [Accessed 12 Jul. 2023].

Dotnettutorials.net. (2023). Available at: https://dotnettutorials.net/lesson/event-listener-interfaces-in-java/ [Accessed 12 Jul. 2023].

https://www.facebook.com/BrainKart-678754188988648 (2017). Event Listener Interfaces - Java. [online] BrainKart. Available at: https://www.brainkart.com/article/Event-Listener-Interfaces---Java_10640/ [Accessed 12 Jul. 2023].

Learning outcomes:

- Action listener
- Mouse Listener
- Mouse Motions
- Item Listener
- Window Listener

Revision Questions

1. Explain what is an event listener?
2. Why are events connected to buttons?
3. List the different type of event listeners?
4. What activates listeners?

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Tutorialspoint.com. (2023). AWT Event Listeners. [online] Available at: https://www.tutorialspoint.com/awt/awt_event_listeners.htm [Accessed 12 Jul. 2023].

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