# UNIT 15: INTRODUCTION TO JAVA

## UNIT STRUCTURE

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## 15.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- About the animation
- About the design of animation sequence
- About morphing
- About computer animation application

## 15.2 INTRODUCTION

Animation is a method where images are manipulated to appear as moving object. Traditionally, animation are drawn or painted by hand on transparent celluloid sheets. Most of the animations of today's world are made with computer-generated imagery (CGI). A computer can be 2D and 3D animation. A 2D computer animation can be used for stylistic reasons, low bandwidth, or faster real-time renderings. The examples of computer animation are presented below.

- Motion graphics.
- Sprite animations.
- CSS animations.

- JavaScript animations.
- SVG animations.
- WebGL animations.
- UI animations.
- Web-based game animations.
- A cartoon is an example of animated film.

## 15.3 Design of Animation Sequences

There is a standard approach for carrying out animations. The following four steps are followed in designing an animation sequence:

- **Layout of Storyboard :** It is the rough diagram needed to show what exactly we want to perform. It defines what we are going to do or what are the events going to happen in a sequence of the motion. It includes a list of basic ideas or a set of rough diagrams depending on what type of animation will be produced.
- **Definitions of Object :** The different objects which will be used in the action should be defined with reference to basic shapes, such as rectangle, circle, spline, etc. The designated shape of an object is corresponding to the movement of each object.
- **Specifications of Key-frame :** The starting and the ending point of the motion sequence is the key-frame specification. It defines the explicit drawing of an animation sequence at a certain time.
- **In-between frames Generation :** The frames in the middle of the key-frames, i.e., starting and the ending frames of the motion sequence which helps to create the illusion of motion are called the in-between frames of the film.

  Depending on the application, many other tasks might also be required to carry out an animation design. Many of these functions are nowadays computer generated which are required to produce animations. Some animations might require functions like motion verification, editing, producing and synchronization of sound tracks.



**CHECK YOUR PROGRESS**

**Q 1:** True or False

a. Flash is 2d Animation.

b. Maya is a animation software

c. Claymation is stop motion animation

**Q 2:** What is an object in animation?

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**Q 3:** What is an animation?

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## 15.4 Morphing

Morphing is the technique used to transform one image to another. Morphing is basically a geometric interpolation technique used in motion sequences for the transformation of object shapes smoothly and continuously with no apparent gaps or spaces in-between frames. The morphing process is simple and it consists of not so complicated linear interpolations that produce intermediate forms between two maximal forms. In this technique an image is step by step altered without any observable individual changes during the process in a motion sequence of an animation video or film to create the illusion of movement and changes of shape of objects.

## 15.5 Application of Computer Animation

- Animation gives life to our imagination. Anything we imagine could be converted into animated artwork and presented. Animation has an important role in modern day education, entertainment, advertisement, scientific visualization, gaming, creative art etc.
- Animation helps teachers to teach and make students learn easily by using computer animated videos and displays of any topic they want.

Animation is used in training centres, schools and colleges.

- Then comes the entertainment industry, where animations play a vital role. Many motion pictures, music videos, television shows; especially children cartoon shows use animation methods.
- In advertisements too, animation is used. Suppose a new mobile phone is getting launched, so to show its functions, its usages, an animation video is often created to attract the customers.
- Scientists use animation videos to show how a particular scientific reaction occurs, for example, reactions of some atoms could be shown through an animated video for the visualization of students and learners.
- Animation also has a vast use in gaming. The characters in computer games and all the graphical events that happen in a computer game are the result of animation. Graphic designers use animation to create their art forms.
- Describing any kind of financial, statistical, mathematical, scientific and economic data is made easy and presentable by animated presentations.

## 15.6 Future of Animation

The following points can be considered as the future of the animation.

- The animation world is a fast growing field of computer graphics. It is a valuable and easy tool for storytelling and artwork. Animation has the prospect of telling stories in a realistic way.
- Animation, both as an industry and art form is in great demand nowadays. Animated motion pictures capture the attention of audiences.
- Animation helps in communicating information effectively and quickly.
- The animation industry has a bright future since it has been growing day by day with improvement in quality.
- People around the world accept it both as an art form and also as an industry by paying more attention to the animation movies and computer games.

- Animation is getting interesting, popular and widespread even during and after the pandemic.



**CHECK YOUR PROGRESS**

**Q 1:** Define two application of animation

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**Q 2:** What is AR?

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**Q 3:** What is VR?

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## 15.7 LET US SUM UP

- Animation is a method where images are manipulated to appear as moving object. Traditionally, animation are drawn or painted by hand on transparent celluloid sheets.
- The examples of animation are presented below.
  - Motion graphics.
  - Sprite animations.
  - CSS animations.
  - JavaScript animations.
  - SVG animations.
  - WebGL animations.
  - UI animations.
  - Web-based game animations.
  - A cartoon is an example of animated film.
- There are four steps for designing an animation
  - Layout of Storyboard :
  - Definitions of Object
  - Specifications of Key-frame

- In-between frames Generation

- Morphing is the technique used to transform one image to another. Morphing is basically a geometric interpolation technique used in motion sequences for the transformation of object shapes smoothly and continuously with no apparent gaps or spaces in-between frames.



## 15.8 FURTHER READING

1) Computer Animation: Algorithms and Techniques by Book by Rick Parent.



## 15.9 ANSWER TO CHECK YOUR PROGRESS

**Ans to Q No 1:** I) True ii) True iii) True

**Ans to Q No 2:** The different objects which will be used in the action should be defined with reference to basic shapes, such as rectangle, circle, spline, etc. The designated shape of an object is corresponding to the movement of each object.

**Ans to Q No 3:** Animation is a method where images are manipulated to appear as moving object.

**Ans to Q No 4:**

- Animation gives life to our imagination. Anything we imagine could be converted into animated artwork and presented. Animation has an important role in modern day education, entertainment, advertisement, scientific visualization, gaming, creative art etc.
- Animation helps teachers to teach and make students learn easily by using computer animated videos and displays of any topic they want. Animation is used in training centres, schools and colleges.

**Ans to Q No 5:** Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somato sensory and olfactory.

**Ans to Q No 6:** Virtual reality is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment, education and business.



## 15.10 MODEL QUESTIONS

**Q 1:** What do you mean by animation?

**Q 2:** What is the difference computer animation and animation>

**Q 3:** What are the design techniques of animation?

**Q 4:** What is morphing?

**Q 5:** Explain the computer application of animation.

**Q 6:** Give some example of computer animation.

**Q 7:** Explain the AR and VR.

**Q 8:** Explain the application of AR VR in animation.

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