

# Visualization Job Interview Questions And Answers



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## Visualization Interview Questions And Answers Guide.

### Question - 1:

What is Surface rendering in Visualization?

#### Ans:

- \* Lightening conditions in the screen
- \* Assigned characteristics
- \* Degree of transparency
- \* How rough or smooth the surfaces are to be
- \* Exploded and cutaway views
- \* Three dimensional and stereoscopic views

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### Question - 2:

Explain the steps involved in 3D transformation?

#### Ans:

- \* Modeling Transformation
- \* Viewing Transformation
- \* Projection Transformation
- \* Workstation Transformation

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### Question - 3:

What is Depth CUEING in Visualization?

#### Ans:

Basic problem for visualization techniques is called depth cueing.

Some 3D objects are without depth information visible line and surface identification To highlight the visible lines display visible lines as dashed lines removing the invisible lines.

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### Question - 4:

Explain informational visualization?

#### Ans:

Information visualization concentrates on the use of computer-supported tools to explore large amount of abstract data. The term "information visualization" was originally coined by the User Interface Research Group at Xerox PARC and included Dr. Jock Mackinlay. Practical application of information visualization in computer programs involves selecting, transforming and representing abstract data in a form that facilitates human interaction for exploration and understanding. Important aspects of information visualization are dynamics of visual representation and the interactivity. Strong techniques enable the user to modify the visualization in real-time, thus affording unparalleled perception of patterns and structural relations in the abstract data in question.

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### Question - 5:

Can you please explain the difference between general graphics system designed for a programmer and one designed for a specific application, such as architectural design?

#### Ans:

Basically, packages designed for graphics programming contain functions for setting primitives, attributes, and parameters for various graphics operations such as viewing and transformations. Packages designed for applications allow a user to create scenes in terms of the particular application, rather than in terms of graphics functions.

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### Question - 6:



Which major components (hardware and software) are needed for computer graphics?

**Ans:**

Besides the basic computer, some special devices and software may be required especially for computer graphics. For hardware, a special high-resolution, color monitor is often demanded and some input tools, e.g. mouse and joy-sticker, and hard-copy devices, e.g. high-resolution color printer, may be required. For software, some special purpose utilities (device-dependent and device-independent) are needed for handling processing in computer graphics.

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### Question - 7:

What is Ellipse generating Algorithm in Visualization?

**Ans:**

Algorithm

Step 1: Input radius  $r_x$ ,  $r_y$  and ellipse center  $(X_c, Y_c)$  and obtain the first point on the circumference of a circle centered on the origin as  $(X_0, Y_0) = (0, r_y)$

Step 2: Calculate the initial values of the decision parameter in region 1 as  $P_{10} = r_y$

$2 - r_x$

$2 r_y + 1/4 r_x$

2

Step 3: At each position starting at  $X_k$  position in region 1, starting at  $k = 0$ , perform the following test:

If  $P_k < 0$ , the next point to plot is  $(X_{k+1}, Y_k)$  and

$P_{1k+1} = P_{1k} + 2 r_y$

$2 X_{k+1} + r_y$

2

Otherwise the next point is  $(X_{k+1}, Y_{k-1})$  and

$P_{1k+1} = P_{1k} + 2 r_y$

$2 X_{k+1} - 2 r_y$

$2 Y_{k+1} + r_y$

2

Step 4: Calculate the initial values of the decision parameter in region 2 as

$P_{20} = r_y$

$2 (X_0 + 1/2) 2 + r_x$

$2 (Y_0 - 1) 2 - r_x$

$2 r_y$

2

Step 5: At each position starting at  $Y_k$  position in region 2, starting at  $k = 0$ , perform the following test:

If  $P_k > 0$ , the next point to plot is  $(X_k, Y_{k-1})$  and

$P_{2k+1} = P_{2k} - 2 r_y$

$2 Y_{k+1} + r_x$

2

Otherwise the next point is  $(X_{k+1}, Y_{k-1})$  and

$P_{2k+1} = P_{2k} - 2 r_y$

$2 Y_{k+1} - 2 r_x$

$2 Y_{k+1} + r_x$

2

Step 6: Determine symmetry points in the other three octants

Step 7: Move each pixel position  $(X, Y)$  onto the circular path centred on

$(X_c, Y_c)$  and plot the coordinate values as

$X = X + X_c$   $Y = Y + Y_c$

Step 8: Repeat steps for region 1 until  $2 r_y$

$2 X \geq 2 r_y$

$2 Y$

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### Question - 8:

What is Depth sorting method in Visualization?

**Ans:**

Both image and object space operations

Perform the basic function

Surface are sorted in order of decreasing depth

Surface are scan converted in order, starting with the surface of greatest depth

Often referred as painters algorithm

Test listed in the order of increasing difficulty

Surface do not overlap

Projections of the two surfaces on to the view plane do not overlap

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### Question - 9:

Explain the advantages of electrostatic plotters?

**Ans:**

\* They are faster than pen plotters and very high quality printers.

\* Recent electrostatic plotters include a scan-conversion capability.



\* Color electrostatic plotters are available. They make multiple passes over the paper to plot color pictures.

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### Question - 10:

What is pixel phasing in Visualization?

#### Ans:

Pixel phasing is an antialiasing technique, stair steps are smoothed out by moving the electron beam to more nearly approximate positions specified by the object geometry.

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### Question - 11:

Explain winding number in Visualization?

#### Ans:

Winding number method is used to check whether a given point is inside or out side the polygon. In this method give a direction number to all the edges which cross the scan line. If the edge starts below the line and ends above scan line give direction as -1. otherwise 1. For polygons or two dimensional objects, the point is said to be inside when the value of winding number is nonzero.

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### Question - 12:

What is Perspective projection?

#### Ans:

Done by the projecting points to the display plane along the converging points Causes the objects farther from the viewing point should be smaller of the same sized object present here.

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### Question - 13:

What is Parallel projection?

#### Ans:

The production of the 2D display of the 3D scene is called projection. Project points on the object surface along the parallel lines on to the display plane. Different 2D views of objects can be produced by projecting the visible points.

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### Question - 14:

Explain Blobby object?

#### Ans:

Some objects do not maintain a fixed shape, but change their surface characteristics in certain motions or when in proximity to other objects. That is known as blobby objects. Example - molecular structures, water droplets.

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### Question - 15:

Can you please explain the difference between bitmap and pixmap?

#### Ans:

The frame buffer used in the black and white system is known as bitmap which take one bit per pixel. For systems with multiple bits per pixel, the frame buffer is often referred to as a pixmap.

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### Question - 16:

What are the merits and demerits of Penetration techniques in Visualization?

#### Ans:

- \* It is an inexpensive technique.
- \* It has only four colors.
- \* The quality of the picture is not good when it is compared to other techniques.
- \* It can display color scans in monitors.

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### Question - 17:

What is Bresenham's line drawing algorithm in Visualization?

#### Ans:

In Bresenham's approach the pixel position along a line path are determined by sampling unit X intervals. Starting from the left end point( $X_0, Y_0$ ) of a given line we step to each successive columns and plot the pixel whose scan line Y-value is closest to the line path. Assuming the Kth step in process, determined that the pixel at ( $X_k, Y_k$ ) decide which pixel to plot in column  $X_{k+1}$ . The choices are ( $X_{k+1}, Y_k$ ) and ( $X_{k+1}, Y_{k+1}$ )



### Algorithm

Step 1: Input the line endpoints and store the left endpoint in (X0, Y0)

Step 2: Load (X0, Y0) in to the frame buffer

Step 3: Calculate constants  $x, y, 2y, -2x$ , and obtain the decision parameters as

$P_0 = 2y - x$

Step 4 : At each  $X_k$  along the line, starting at  $k = 0$ , perform the following test

If  $P_k < 0$ , the next point to plot is  $(X_{k+1}, Y_k)$  and

$P_{k+1} = P_k + 2y$

Otherwise, the next point to plot is  $(X_{k+1}, Y_{k+1})$  and

$P_{k+1} = P_k + 2y - 2x$

Step 5: Repeat step 4  $x$  times

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### Question - 18:

What is Non-emissive in Visualization?

#### Ans:

They are optical effects to convert the sunlight or light from any other source to graphic form. Liquid crystal display is an example.

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### Question - 19:

What is emissive in visualization?

#### Ans:

The emissive display converts electrical energy into light energy. The plasma panels, thin film electro-luminescent displays are the examples.

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### Question - 20:

What is scan code in Visualization?

#### Ans:

When a key is pressed on the keyboard, the keyboard controller places a code carry to the key pressed into a part of the memory called as the keyboard buffer. This code is called as the scan code.

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### Question - 21:

Explain some basic features of computer graphics?

#### Ans:

The salient feature of computer graphics is the creation and manipulation of graphics (artificial images) by computer.

Computer graphics provides a tool called as motion dynamics which allows user to move object.

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### Question - 22:

What is resource Manager in flex actionscript?

#### Ans:

Resource Manager now handles access to all localized resources in an application. Any components that extend UIComponent, Formatter, or Validator now have a new resourceManager property, which lets you easily access the singleton instance of this manager. If you're writing some other kind of class that needs to use the Resource Manager, you can call Resource Manager. getInstance() to get a reference to it.

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### Question - 23:

What is Raster scan systems?

#### Ans:

Several processing units:

\* Contains a special purpose processor, called video controller or display controller

\* Video controller: A fixed area of the system memory is reserved for the frame buffer, and the video controller is given access to the framebuffer memory.

Two registers are used to store the coordinates of the screen pixels.

The value is stored in the frame buffer for this pixel position is then retrieved and used to set the intensity of the CRT beam Initially the x register is set to 0 and the y register is set to ymax.

Then the x register is incremented by 1, and the process repeated for the next pixel on the top scan line.

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### Question - 24:

Can you please explain the difference between window port & view port?

#### Ans:

A portion of a picture that is to be displayed by a window is known as window port. The display area of the part selected or the form in which the selected part is viewed is known as view port.

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### Question - 25:

Visualization interview questions part 7:

#### Ans:

- \* There are three types of variable we use in information visualization. What are they? Explain them.
- \* Scatter-plot matrices are widely used in field of information visualization. What kind of data do it represent?
- \* What does a cyclic means in context of visualization?
- \* What is difference between rollover & brushing?
- \* What is sunburst model? How information can be represented in it?
- \* What are the major problems in 3D visualizations? How can they be solved?
- \* Describe several information visualizations that you believe will be possible and useful with the widespread adoption of virtual reality systems?
- \* Name & describe few techniques that are suitable for representing huge amount of data. What are their relative merits?
- \* Explain what Tufte meant by 'Data-Ink Maximization'?

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### Question - 26:

Visualization interview questions part 6:

#### Ans:

- \* What are the capabilities of adobe's Flex Framework? How can we use it for creating rich visualizations?
- \* What are hyperbolic tree views? How they are used in visual representation of data?
- \* Mention few advantages & disadvantages of tree-maps method of visualization?
- \* What do you understand by magic lens technique? How it is used for information visualization?
- \* What is document visualization? What are common issues in it?
- \* List few methods to solve problem of data overflow from the screen?
- \* What are chernoff faces & how they are useful in information visualization?

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### Question - 27:

Visualization interview questions part 5:

#### Ans:

- \* What is data mining? How it is different from information visualization?
- \* What do you understand by mind-maps?
- \* What is scientific visualization? How it is different from other visualization techniques?
- \* What is flow visualization? How it is different from volume visualization?
- \* Semiotics of graphics plays important role in visualization. How?
- \* Can you pour some light over Gibson's Affordance theory?
- \* What is the concept of data suppression?

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### Question - 28:

Visualization interview questions part 4:

#### Ans:

- \* List and give examples of the Wehrend & Lewis eleven basic actions in visualization environments?
- \* Can give few examples of applications which allow zooming while maintaining context?
- \* What are the fundamental problems faced by the applications providing zooming capabilities?
- \* Pour some light over pre-attentive processing?
- \* What are the ways for solving problem of occlusion while drawing edges of a map or a graph?
- \* What is the main yet to be solved problem that always haunt people in the field of information visualization?
- \* What are the trends expected in the field of information visualization in near future?

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### Question - 29:

Visualization interview questions part 3:

#### Ans:

- \* Is it possible to have Dynamic Visualizations? If yes, then frame a scenario in which dynamic visualization would be a better option than other counterpart?
- \* How visualization can be a boon in education sector?
- \* Give two ways Information visualization improves cognition?
- \* What kind of rich compelling visualizations would be suitable for representing trends of a country's population?
- \* Is it possible that visualization might have user interactions as well in it? In which scenarios we can employ user interactions in addition to visual representation of data?
- \* What is common way of visually representing multivariate data-sets?
- \* Explain briefly basic elements of a graph. How can it be visualized?

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### Question - 30:

Visualization interview questions part 2:

#### Ans:

- \* Differentiate Data Visualization with Statistical Graphics?
- \* What are various types of information visualization techniques?
- \* Draw the flowchart of visualization stages?
- \* Name few of the sub-fields of Visualization?



- \* How would you differentiate visualization with a data-based infographics?
- \* Name few of the primitive form graphical data representation?
- \* What is a tag cloud? How do bloggers use them to present their information?

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### Question - 31:

Visualization interview questions part 1:

#### Ans:

- \* What do you mean by the term visualization?
- \* How does computer graphics helps in visualization?
- \* Name few of the fields that are heavily dependent on visualization?
- \* Data visualizations have been there for decades, but in near past IT industries have had a great impact on them, how?
- \* What is the significance of IT industries over visualization?
- \* Can you name some of the downsides of Visualization?
- \* Give few examples of Visualization tools that are available in the market?
- \* Give the references of few real life scenarios in which visualization play important role?
- \* How does visualization amplifies cognition?

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### Question - 32:

Does visualization really work?

#### Ans:

Visualization is one of the most powerful ways available to improve your brainstorming, ideation, organizaing, planning, communication, and measurement. But don't take our word for it! There has been a lot of scientific research on the topics.

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### Question - 33:

Computer Visualization Job Interview Questions Part 10:

#### Ans:

- What is difference between rollover & brushing?
- What is sunburst model? How information can be represented in it?
- What are the major problems in 3D visualizations? How can they be solved?
- Describe several information visualizations that you believe will be possible and useful with the widespread adoption of virtual reality systems.
- Name & describe few techniques that are suitable for representing huge amount of data. What are their relative merits?
- Explain what Tufte meant by 'Data-Ink Maximization'.

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### Question - 34:

Computer Visualization Job Interview Questions Part 9:

#### Ans:

- List few methods to solve problem of data overflow from the screen.
- What are chernoff faces & how they are useful in information visualization?
- There are three types of variable we use in information visualization. What are they? Explain them.
- Scatterplot matrices are widely used in field of information visualization. What kind of data do it represent?
- What does acyclic means in context of visualization?

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### Question - 35:

Computer Visualization Job Interview Questions Part 8:

#### Ans:

- What are the capabilities of adobe's Flex Framework? How can we use it for creating rich visualizations?
- What are hyperbolic tree views? How they are used in visual representation of data?
- Mention few advantages & disadvantages of treemaps method of visualization.
- What do you understand by magic lens technique? How it is used for information visualization?
- What is document visualization? What are common issues in it?

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### Question - 36:

Computer Visualization Job Interview Questions Part 7:

#### Ans:

- What is scientific visualization? How it is different from other visualization techniques?
- What is flow visualization? How it is different from volume visualization?
- Semiotics of graphics plays important role in visualization. How?
- Can you pour some light over Gibson's Affordance theory?
- What is the concept of data suppression?

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### Question - 37:





Computer Visualization Job Interview Questions Part 6:

**Ans:**

What are the ways for solving problem of occlusion while drawing edges of a map or a graph?  
What is the main yet to be solved problem that always haunt people in the field of information visualization?  
What are the trends expected in the field of information visualization in near future?  
What is data mining? How it is different from information visualization?  
What do you understand by mindmaps?

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**Question - 38:**

Computer Visualization Job Interview Questions Part 5:

**Ans:**

Explain briefly basic elements of a graph. How can it be visualized?  
List and give examples of the Wehrend & Lewis eleven basic actions in visualization environments.  
Can give few examples of applications which allow zooming while maintaining context.  
What are the fundamental problems faced by the applications providing zooming capabilities?  
Pour some light over pre-attentive processing.

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**Question - 39:**

Computer Visualization Job Interview Questions Part 4:

**Ans:**

How visualization can be a boon in education sector?  
Give two ways Information visualization improves cognition.  
What kind of rich compelling visualizations would be suitable for representing trends of a country's population?  
Is it possible that visualization might have user interactions as well in it? In which scenarios we can employ user interactions in addition to visual representation of data.  
What is common way of visually representing multivariate datasets?

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**Question - 40:**

Computer Visualization Job Interview Questions Part 3:

**Ans:**

Name few of the subfields of Visualization.  
How would you differentiate visualization with a data-based infographics?  
Name few of the primitive form graphical data representation.  
What is a tag cloud? How do bloggers use them to present their information?  
Is it possible to have Dynamic Visualizations? If yes, then frame a scenario in which dynamic visualization would be a better option than other counterpart.

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**Question - 41:**

Computer Visualization Job Interview Questions Part 2:

**Ans:**

Give the references of few real life scenarios in which visualization play important role.  
How does visualization amplifies cognition?  
Differentiate Data Visualization with Statistical Graphics.  
What are various types of information visualization techniques?  
Draw the flowchart of visualization stages.

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**Question - 42:**

Computer Visualization Job Interview Questions Part 1:

**Ans:**

What do you mean by the term visualization? How does computer graphics helps in visualization?  
Name few of the fields that are heavily dependent on visualization.  
Data visualizations have been there for decades, but in near past IT industries have had a great impact on them, how? What is the significance of IT industries over visualization?  
Can you name some of the downsides of Visualization?  
Give few examples of Visualization tools that are available in the market.

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