

Consent

RESEARCH SUBJECT CONSENT FORM

Title: Concept Induction Using Large Language Models

Investigator: Pascal Hitzler

Daytime Phone Number: 785-532-6350

Purpose: You are invited to participate in a research study on assessing how well people can understand and use the explanations an Artificial Intelligence (AI) system provides for its reasoning process in an image categorization task. This study is funded by Hitzler Startup Kansas State University. You must be 18 years old or older and be an English speaker to participate in this research study.

Procedure: You will be shown images that belong to different categories, as well as explanations that were generated about why those images were placed into categories. You will then be asked to judge which images the categorization explanations best match. You will also be asked to provide additional ratings and feedback about the explanations that you see. Finally, we will ask you some general questions about your thoughts, feelings, and behaviors. These tasks are expected to take approximately 40 minutes to complete.

Voluntary Participation and Freedom to Withdraw: You understand that your participation is voluntary and, should you decide not to participate, there will be no penalty or loss of benefits to which you would otherwise be entitled. There is no alternative procedure for this study except to not participate. If you decide to withdraw there will be no penalty or loss of benefits to which you would otherwise be entitled.

Privacy and Confidentiality: You understand that your identity will remain undisclosed in any report of this research. Raw data will be available to members of the research team, who will treat it as confidential. In order to process payments, we will collect your MTurk ID. After payments are processed, we will remove this information from the data. This anonymous data will be made available via online repositories for other researchers to use.

Potential Benefits and Risks: There are no known risks associated with your participation in this study other than the risk of a breach in confidentiality and loss of anonymity. Successful completion of this study will potentially provide benefits to society and the scientific community. For example, a better understanding of how well people can understand the reasoning of AI systems may have important public policy implications, as well as provide insight into how AI reasoning can be made more understandable so that people can better rely on AI systems.

Costs and Remuneration: You will incur no costs as a result of participating in this study other than your personal time and internet access. You will receive compensation for participation in this study according to the rate specified on the Mechanical Turk HIT listing that advertised this research study. Compensation will be provided through Amazon Mechanical Turk at the rate specified in the listing (estimated at \$7.50/hour). You will be paid for a completed survey but not for an incomplete survey.

Whom to Contact: If you have questions or concerns related to your rights, the research procedures, or research purpose, concerns about the research, complaints about the research, or you think you have been hurt by the research, you can contact the Investigator, Dr. Pascal Hitzler. Contact information is provided below.

Dr. Pascal Hitzler, Principal Investigator, Kansas State University, 785-532-6350, hitzler@k-state.edu
If you have any questions, concerns or complaints about the study, questions about giving consent or your rights as a research participant in this research study, you can also call the Kansas State University Independent Review Board at 785-532-3224.

Agreement to Participate: This consent certifies your willingness to participate in this study. You understand that by clicking the "I agree" button at the end of this consent form, you give your consent to participate in this study.

I agree

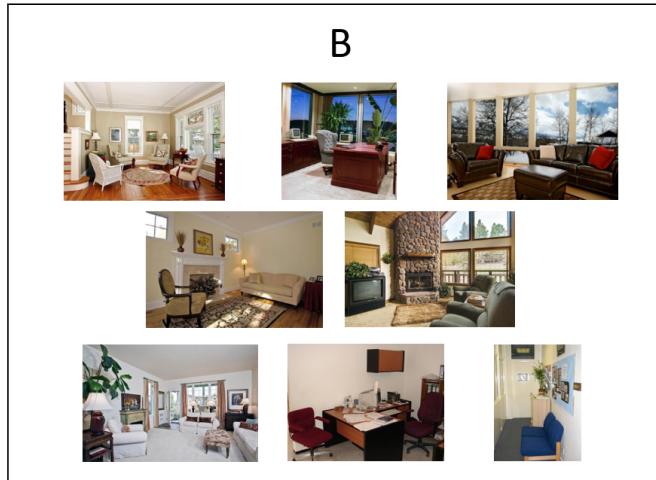
- I do not agree

Instructions

In this study you will be presented with groups of images that have been categorized by a computer system. The computer system has also provided explanations for what makes the groups of images different. Some of the explanations provided by the computer may be better than others. Your task is to choose which of two explanations better describes the difference between two groups of images.

Specifically, you will be asked to choose which of two options best describes what **IS** present in group A that **IS NOT** present in group B.

The explanations will be very short, simply a list of **concepts**. A **concept** can be a physical object present in the images, like a computer or a window, or it can be an abstract category or theme that fits the images, like science or entertainment.



Here is a simple example for practice. In this example there are two groups of eight images and explanations with only one concept.

Which of these better represents what the images in group A have that the images in group B do not?

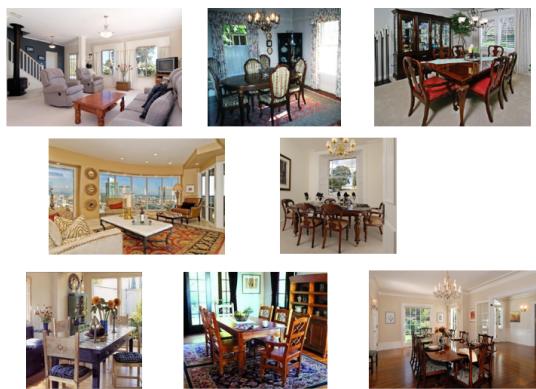
Chair

Table

In this example, **Table** is the better choice, because there is a table present in all images in group A, and there are no tables in any of the images in group B. While there are chairs in all of the images in group A, there are also chairs in the images in group B.

Here is another example using the same images, using abstract concepts this time.

A



B



Which of these better represents what the images in group A have that the images in group B do not?

Dining

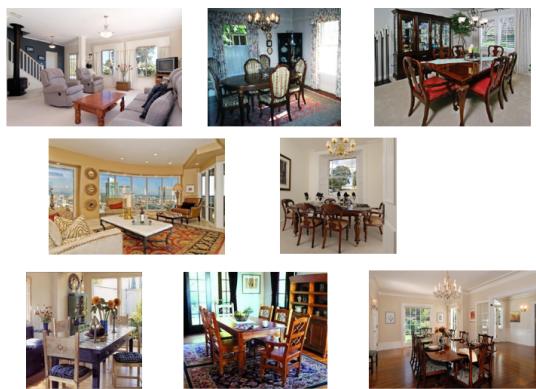


Residential



In this example, **Dining** is the better choice, because it describes the purpose of most of the images in group A, and none in group B. While residential describes the images in group A, it also describes most of the images in group B.

A



B

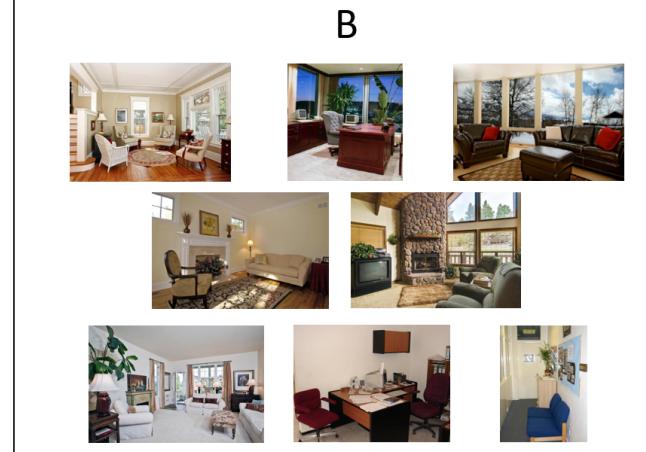


Here is another practice example using the same images from before.

A



B



Which of these better represents what the images in group A have that the images in group B do not?

Cabinet



Light fixture



In this case, both light fixtures and cabinets are present in some of the images in group A, and neither are present in any images in group B. However, not all of the images in group A have a light fixture, and not all have a cabinet. So neither is clearly the better option. So in cases like this you must use your best judgment to decide which you think is better!

Here is a final example. In this example your choices are between two lists of concepts (including some abstract concepts), rather than just single concepts. When deciding which is better, please consider the list of words as a whole, just as you consider the sets of images as a whole.



Which of these better represents what the images in group A have that the images in group B do not?

Carpet, Chair, Family, Fireplace, Residential,
Surface, Wall



Chair, Dining, Floor, Residential, Society,
Table, Window



When looking at lists of words like this, you may find that some words fit one

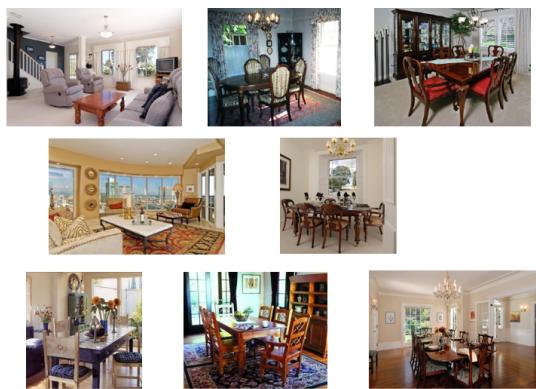
group better than the other, while some may fit both groups. Others may fit neither group. So deciding which list is better requires thought and judgment. In this case, the list "Chair, Dining, Floor, Residential, Society, Table, Window" may be a better list to describe what is in group A that is not in group B. This is because while some of the concepts fit both groups (e.g., Chair, Floor, Residential, Window), some of the words clearly better describe group A (Dining, Table).

The other list (Carpet, Chair, Family, Fireplace, Residential, Surface, Wall) has some concepts that fit group A best (e.g., Surface could describe the purpose of the tables), but also some concepts that better describe group B (e.g., Fireplace).

Your perception of the lists as a whole may be different, and that is okay! **Do note that sometimes there will be a very obviously correct answer, which may be used to verify whether you are paying enough attention to the task.** However, for the majority of trials it will be harder to tell which one is better, so always just use your best judgment on which seems more correct!

Note that concepts are always listed in alphabetical order, and sometimes the same concepts will appear in both lists. This is intentional. **Please read both lists in full to identify all unique words.**

A



B

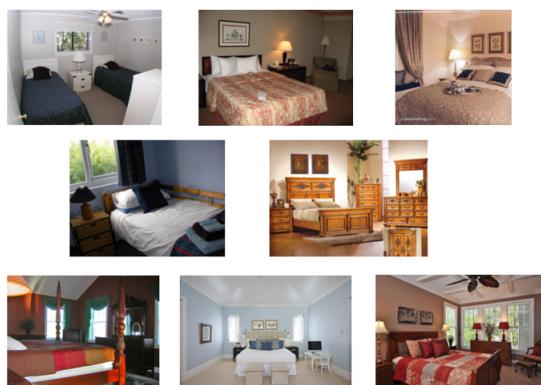


Now the study will begin. You will encounter several sets of images, and must make comparisons between explanations for each set of images. The explanations in the real trials will always consist of several words in a list, so **please consider the entire list of concepts** when deciding which group of concepts provides a better explanation, even if not every concept in the list is a perfect fit.

Please remember that you are looking for the explanation that describes concepts that **ARE PRESENT** in group A that **ARE NOT PRESENT** in group B.

Trials

A



B



Which of these better represents what the images in group A have that the images in group B do not?

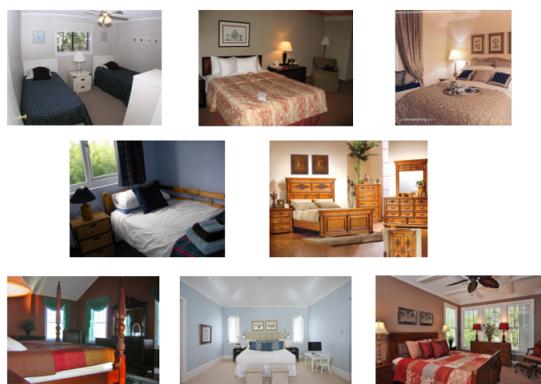
Bed, Bedroom, Blanket, Furniture, Indoor, Lamp, Pillow



Bed, Ceiling, Column, Floor, Pillow, Wall, Window



A



B

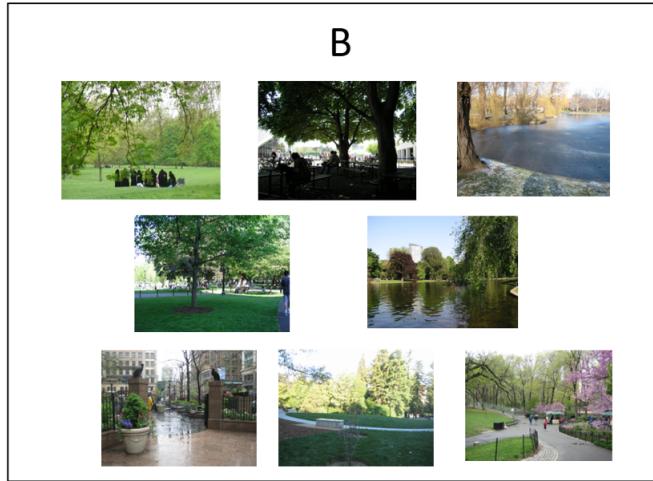
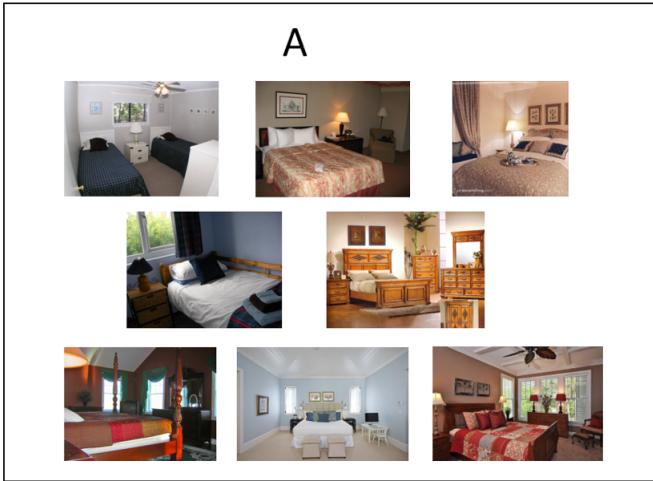


Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Lighting
Fixtures, Household Appliances, Bedroom
Items, Living Room Items, Kitchenware



Bed, Bedroom, Blanket, Furniture, Indoor,
Lamp, Pillow



Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Lighting
Fixtures, Household Appliances, Bedroom
Items, Living Room Items, Kitchenware



Bed, Ceiling, Column, Floor, Pillow, Wall,
Window



Which of these better represents what the images in group A have that the images in group B do not?

Arm, Ceiling, Column, Cushion, Floor, Leg, Chair, Furniture, Indoor, Room, Seat, Sofa,
Wall Table



Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Living Room, Chair, Furniture, Indoor, Room, Seat, Sofa,
Fireplace Setting, Home Interior, Lighting Table
Elements, Home Appliances



○

Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Living Room, Arm, Ceiling, Column, Cushion, Floor, Leg,
Fireplace Setting, Home Interior, Lighting Wall
Elements, Home Appliances



○

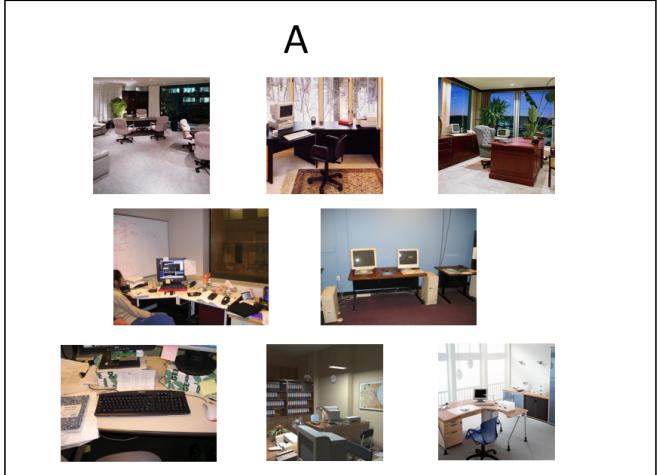


Which of these better represents what the images in group A have that the images in group B do not?

Chair, Computer, Computer case, Desk,
Floor, Wall, Window



Chair, Computer, Desk, Keyboard, Monitor,
Office, Work

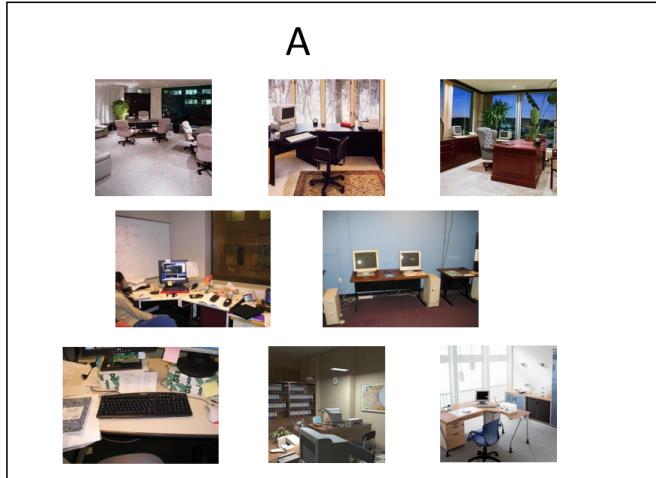


Which of these better represents what the images in group A have that the images in group B do not?

Chair, Computer, Desk, Keyboard, Monitor,
Office, Work



Computer, Desk, Keyboard, Monitor,
Telephone, Bookcase, Desk Lamp



Which of these better represents what the images in group A have that the images in group B do not?

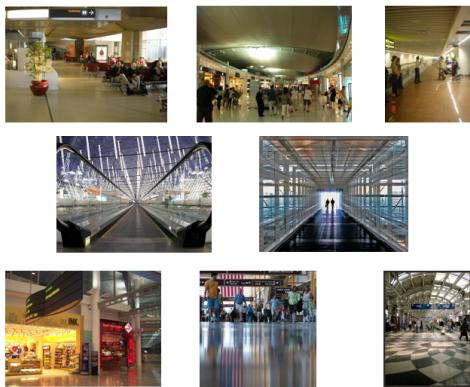
Computer, Desk, Keyboard, Monitor,
Telephone, Bookcase, Desk Lamp



Chair, Computer, Computer case, Desk,
Floor, Wall, Window



A



B

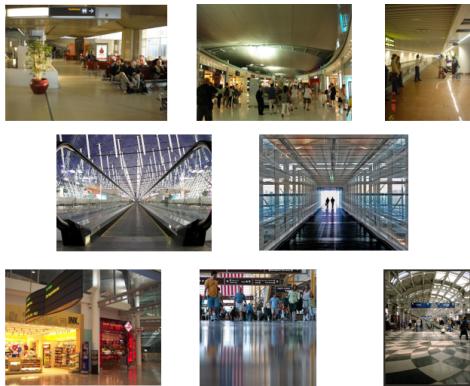


Which of these better represents what the images in group A have that the images in group B do not?

Airport, Corridor, Glass, Indoor, Sign, Travel, Ceiling, Floor, Head, Person, Sign, Suitcase, Window



A



B

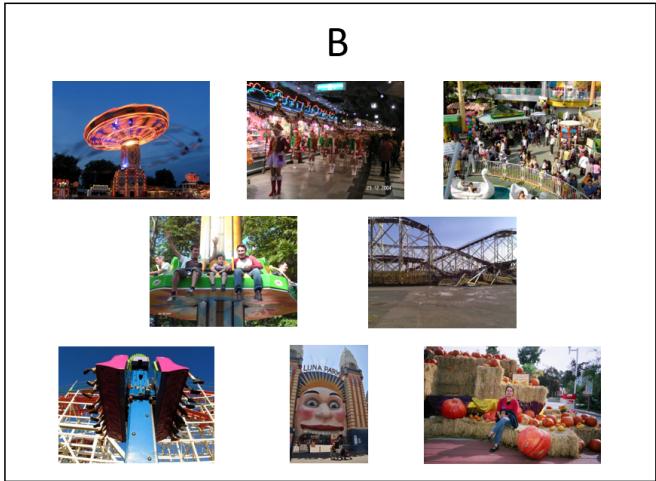
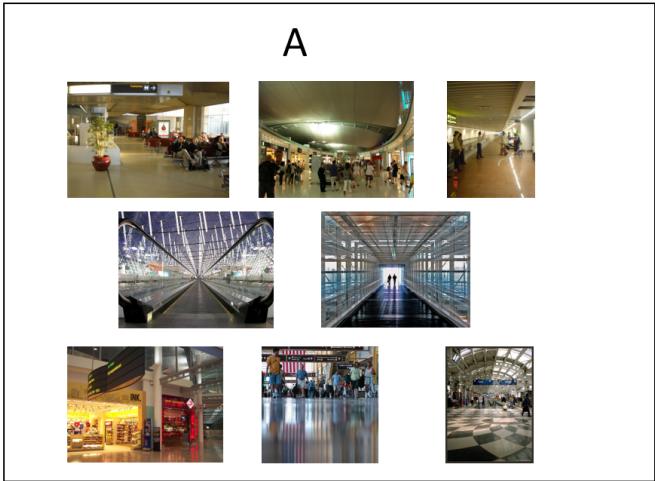


Which of these better represents what the images in group A have that the images in group B do not?

Airport, Corridor, Glass, Indoor, Sign, Travel, Window



Indoor setting, Retail store, Office environment, Public transportation, Airport, Advertisement or Branding, Home interior



Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Floor, Head, Person, Sign, Suitcase, Wall



Indoor setting, Retail store, Office environment, Public transportation, Airport, Advertisement or Branding, Home interior





Which of these better represents what the images in group A have that the images in group B do not?

Bathtub, Countertop, Floor, Mirror, Sink,
Towel, Wall



Bathroom, Bathtub, Mirror, Shower, Sink,
Toilet, Towel

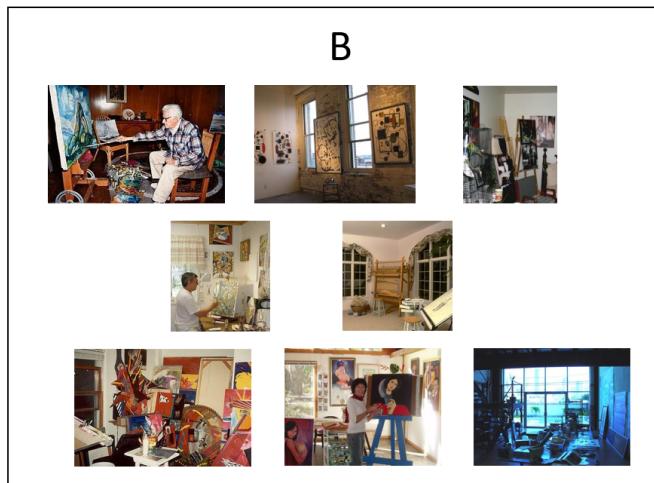


Which of these better represents what the images in group A have that the images in group B do not?

Bathroom, Bathtub, Mirror, Shower, Sink, Toilet, Towel



Bathroom, Bathtub/Shower Area, Toilet Area, Sink/Vanity Area, Bathroom Lighting, Bathroom Accessories, Bathroom Decorations



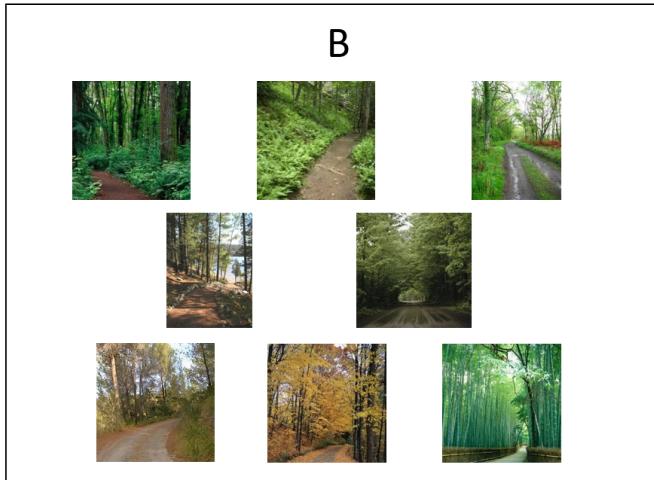
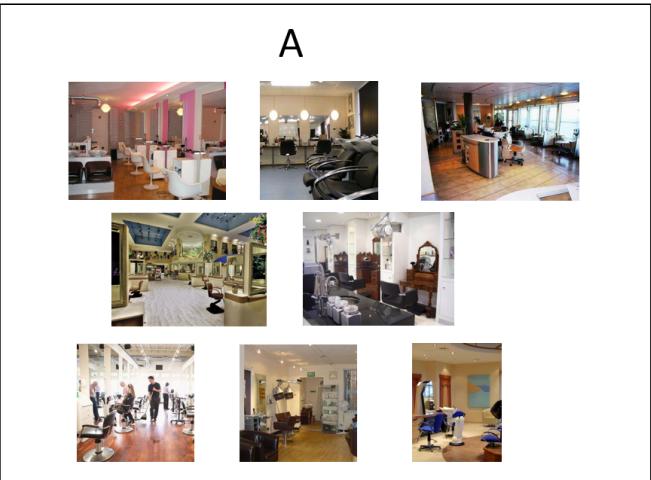
Which of these better represents what the images in group A have that the images in group B do not?

Bathroom, Bathtub/Shower Area, Toilet Area, Sink/Vanity Area, Bathroom Lighting, Bathroom Accessories, Bathroom Decorations



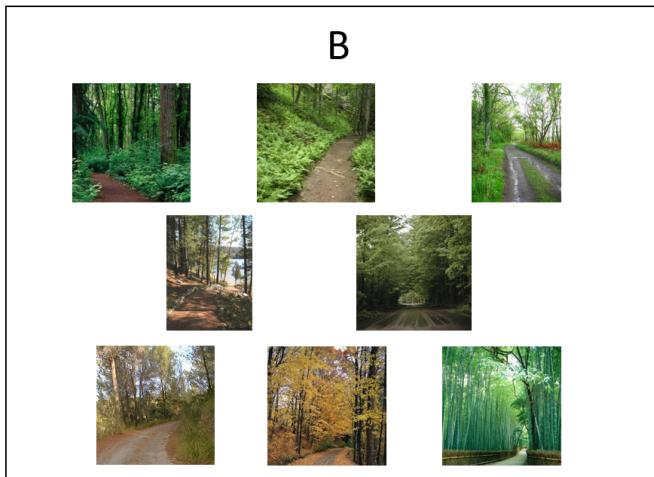
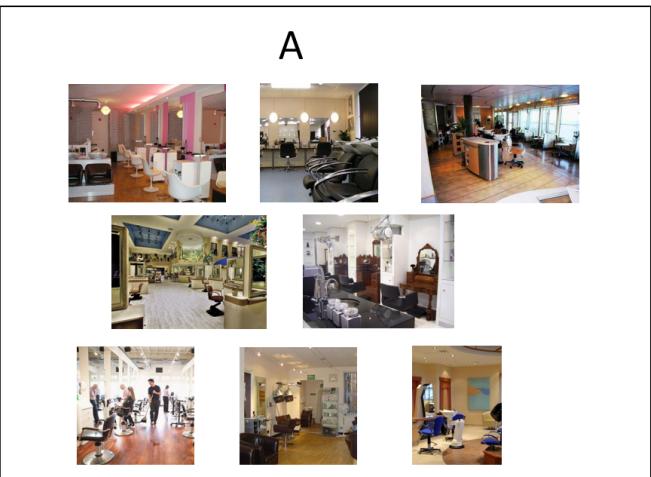
Bathtub, Countertop, Floor, Mirror, Sink, Towel, Wall





Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Floor, Hair dryer, Mirror, Sink, Swivel chair, Indoor, Light fixture, Wall
Business, Chair, Indoor, Light fixture, Mirror, Salon, Sink

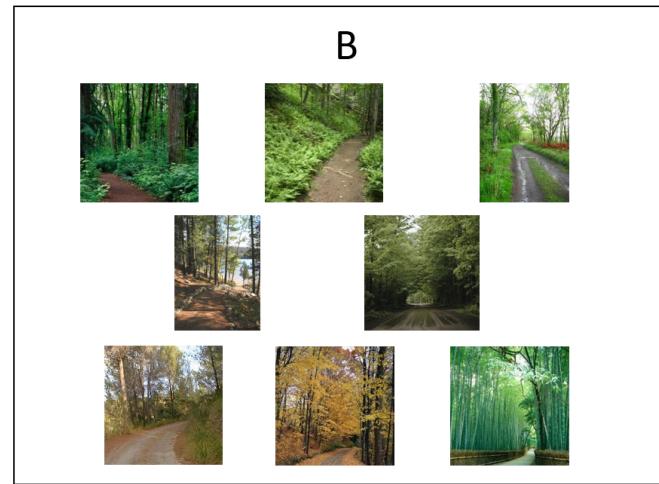


Which of these better represents what the images in group A have that the images in group B do not?

Interior Decor, Furniture, Lighting Fixtures,
Home Appliances, Building Structures,
Personal Care Items, Public Transport



Business, Chair, Indoor, Light fixture, Mirror,
Salon, Sink



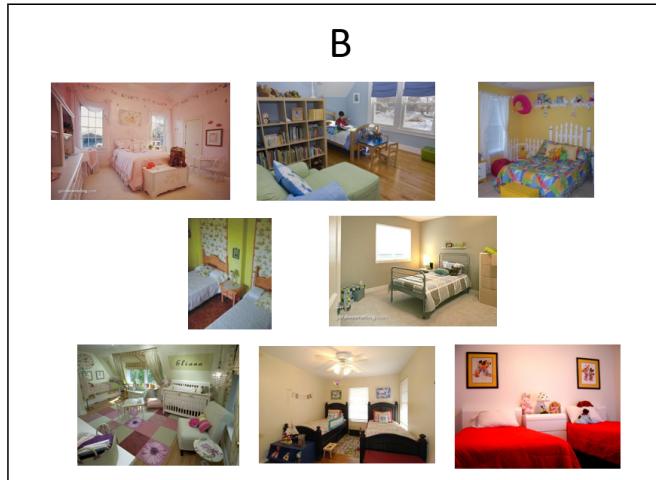
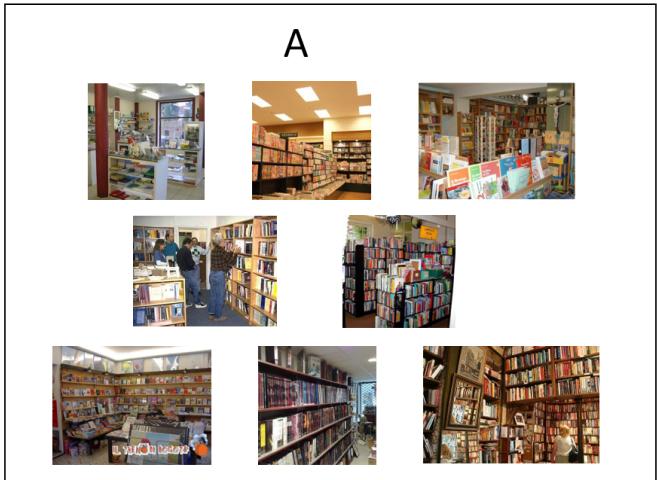
Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Floor, Hair dryer, Mirror, Sink, Swivel
chair, Wall



Interior Decor, Furniture, Lighting Fixtures,
Home Appliances, Building Structures,
Personal Care Items, Public Transport





Which of these better represents what the images in group A have that the images in group B do not?

Book, Bookcase, Ceiling, Floor, Mirror,
Stand, Wall



Bookstore, Browse, Counter, Library, Read,
Shop, Sign



Which of these better represents what the images in group A have that the images in group B do not?

Library, Bookstore, Study Room, Office,
Classroom, Reading Room, Book Exhibition

Bookstore, Browse, Counter, Library, Read,
Shop, Sign

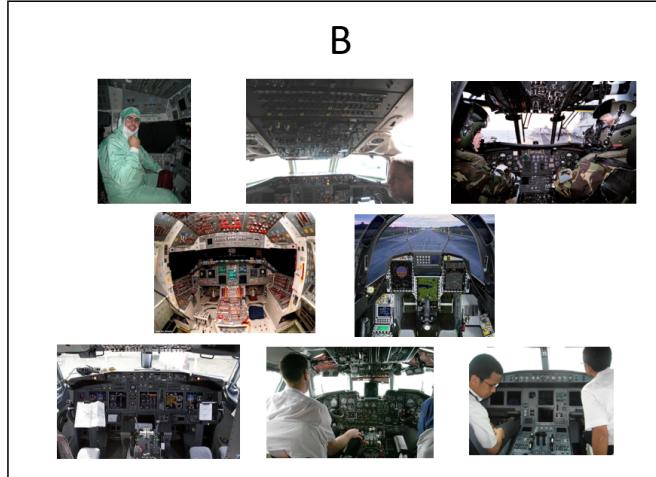
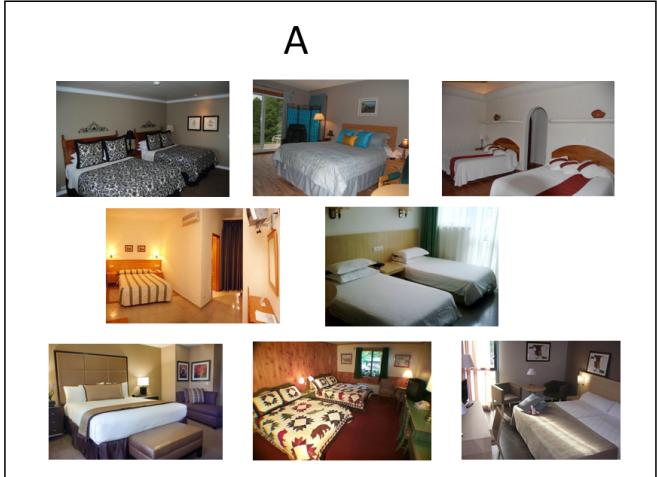


Which of these better represents what the images in group A have that the images in group B do not?

Library, Bookstore, Study Room, Office,
Classroom, Reading Room, Book Exhibition

Book, Bookcase, Ceiling, Floor, Mirror,
Stand, Wall



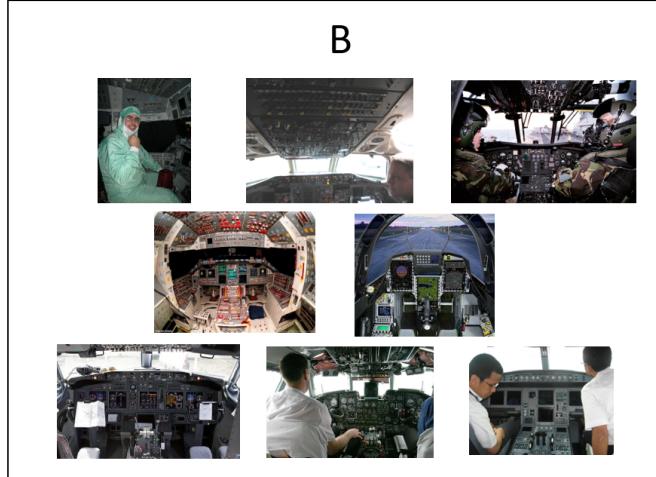
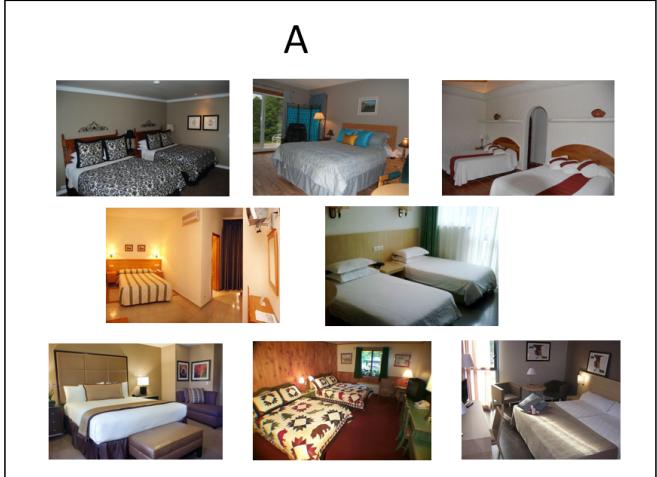


Which of these better represents what the images in group A have that the images in group B do not?

Art, Bed, Bedroom, Hotel, Lamp, Pillow,
Sleep



Bed, Culture, Curtain, Cushion, Floor, Pillow,
Wall

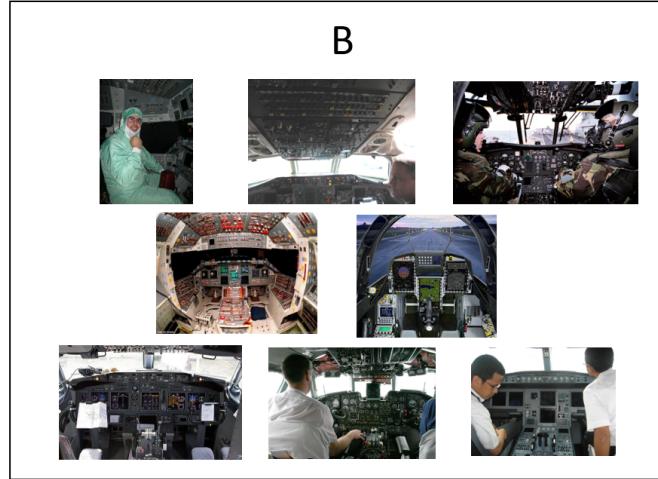
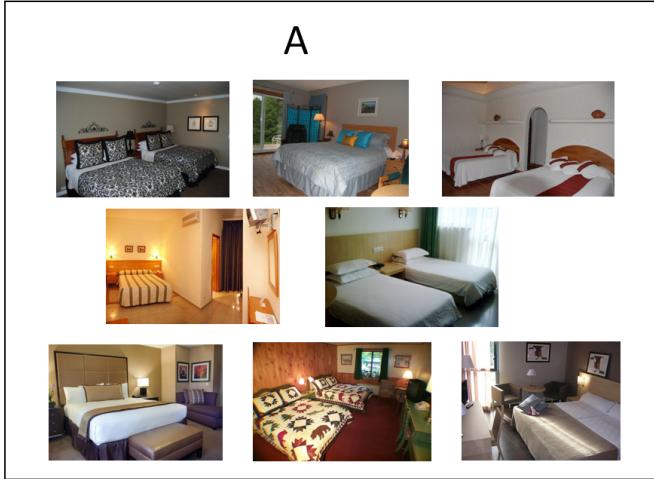


Which of these better represents what the images in group A have that the images in group B do not?

Art, Bed, Bedroom, Hotel, Lamp, Pillow,
Sleep



Living Room, Bedroom, Home Office,
Television Room, Dining Room, Home
Interior, Furniture Display



Which of these better represents what the images in group A have that the images in group B do not?

Living Room, Bedroom, Home Office,
Television Room, Dining Room, Home
Interior, Furniture Display



Bed, Culture, Curtain, Cushion, Floor, Pillow,
Wall



A



B



Which of these better represents what the images in group A have that the images in group B do not?

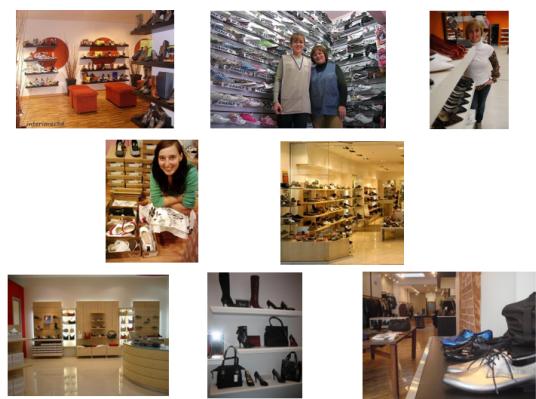
Boot, Ceiling, Floor, Person, Purse, Shoe,
Wall



Business, Display, Heel, Purse, Shelf, Shoe,
Shop



A



B

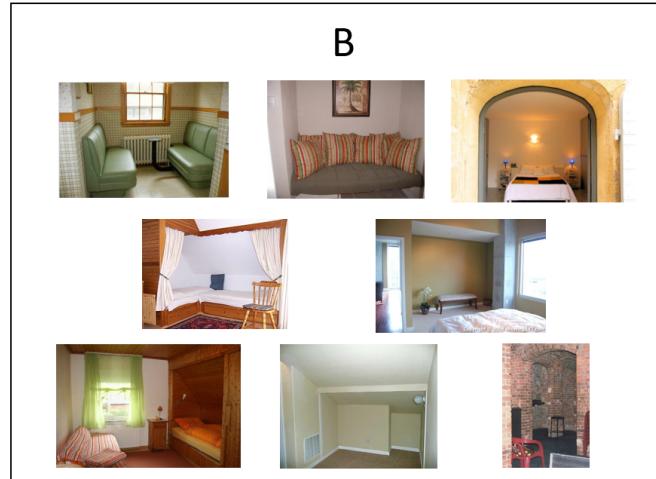


Which of these better represents what the images in group A have that the images in group B do not?

Business, Display, Heel, Purse, Shelf, Shoe, Shop



Retail Store, Clothing Store, Shoe Store, Handbag Store, Apparel Store, Footwear Store, Fashion Store



Which of these better represents what the images in group A have that the images in group B do not?

Boot, Ceiling, Floor, Person, Purse, Shoe, Wall



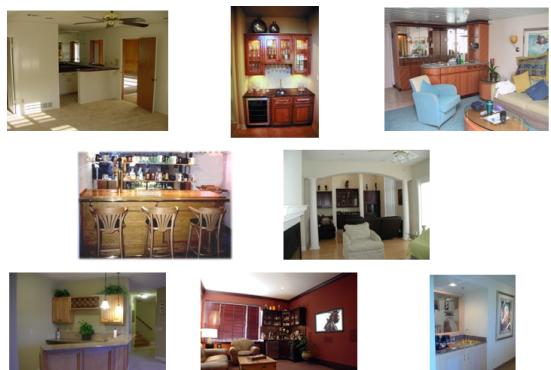
Retail Store, Clothing Store, Shoe Store, Handbag Store, Apparel Store, Footwear Store, Fashion Store



A



B



Which of these better represents what the images in group A have that the images in group B do not?

Construction, Culture, Economic sectors,
Economy, Nature, Sky, Universe



Alley, Architecture, Brick, Outdoor, Shutter,
Street, Tree

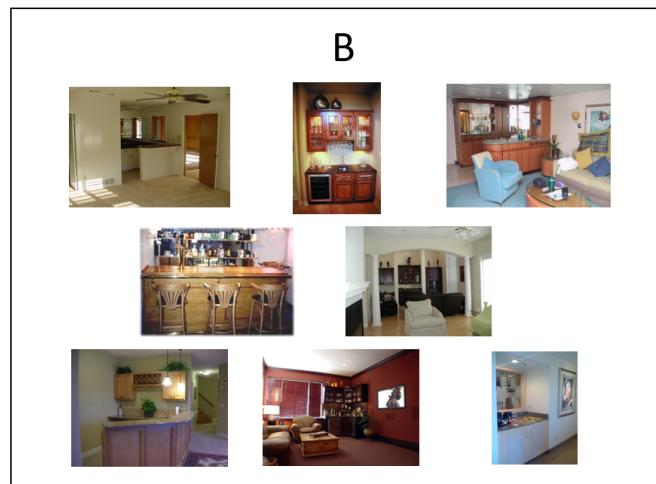
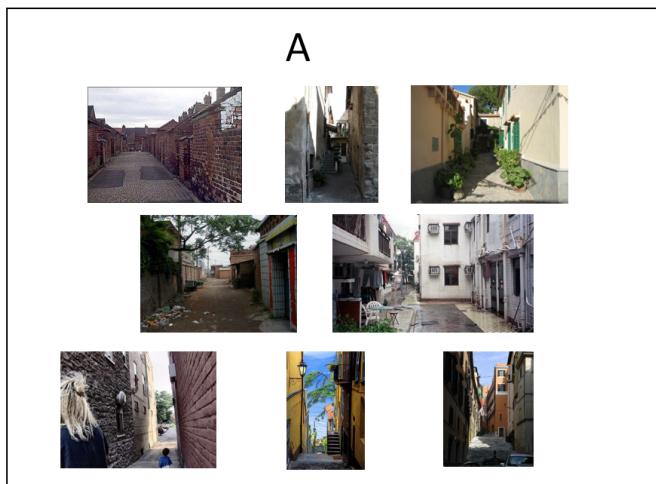


Which of these better represents what the images in group A have that the images in group B do not?

Alley, Architecture, Brick, Outdoor, Shutter,
Street, Tree



Outdoor scenery, Street view, Building
exterior, Roadside objects, Natural elements,
Vehicle presence, Sky view



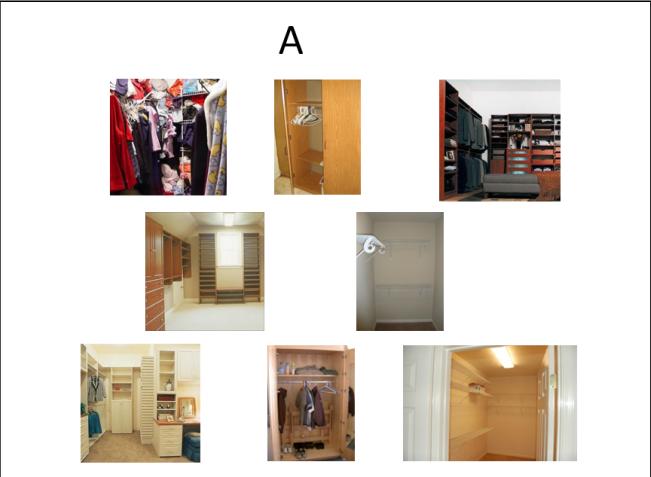
Which of these better represents what the images in group A have that the images in group B do not?

Outdoor scenery, Street view, Building
exterior, Roadside objects, Natural elements,
Vehicle presence, Sky view



Construction, Culture, Economic sectors,
Economy, Nature, Sky, Universe

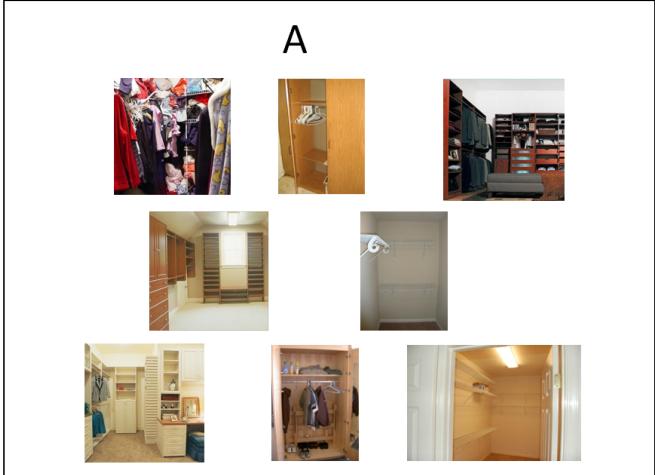




Which of these better represents what the images in group A have that the images in group B do not?

Circle Closet, Clothing, Drawer, Dress, Hanger,
Indoor, Shelf

Circle Bottle, Ceiling, Door, Floor, Jacket, Wall,
Wardrobe

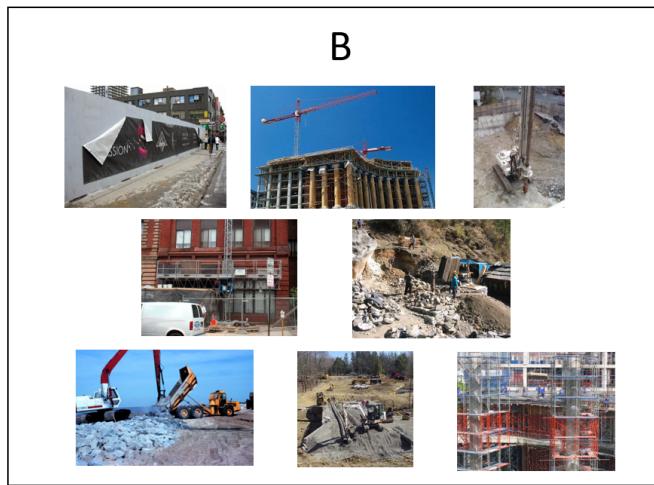
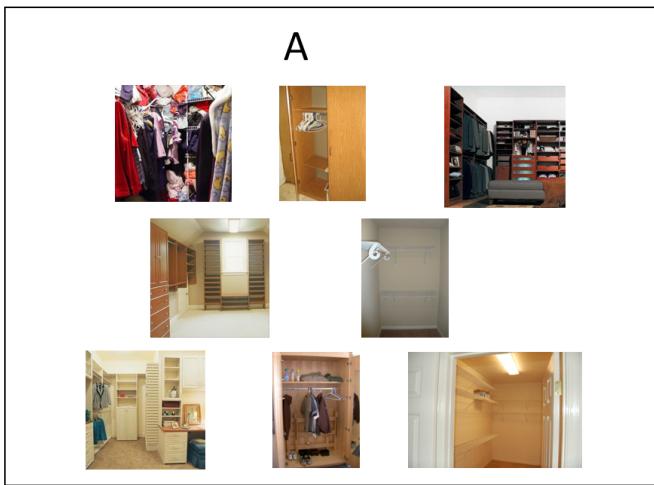


Which of these better represents what the images in group A have that the images in group B do not?

Indoor Scene, Clothing and Apparel, Home Furniture, Storage and Organization, Lighting, Flooring and Walls, Household Items



Indoor Scene, Clothing and Apparel, Home Furniture, Storage and Organization, Lighting, Flooring and Walls, Household Items



Which of these better represents what the images in group A have that the images in group B do not?

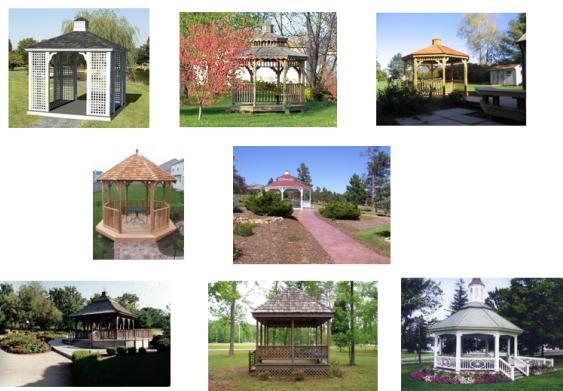
Bottle, Ceiling, Door, Floor, Jacket, Wall, Wardrobe



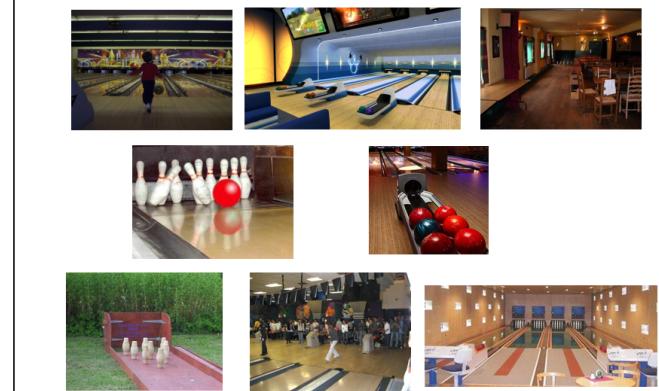
Indoor Scene, Clothing and Apparel, Home Furniture, Storage and Organization, Lighting, Flooring and Walls, Household Items



A



B



Which of these better represents what the images in group A have that the images in group B do not?

Gazebo, Grass, Greenery, Nature, Outdoor, Sky, Tree



Culture, Grass, Nature, Roof, Sky, Tree, Universe



A



B

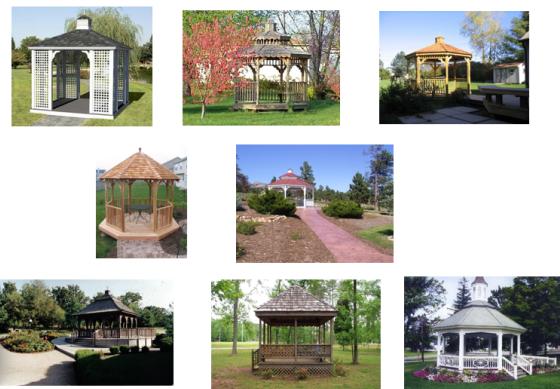


Which of these better represents what the images in group A have that the images in group B do not?

Street Light, Mountain, Fire Hydrant,
Bandstand, Roof, Fence, Water



Gazebo, Grass, Greenery, Nature, Outdoor,
Sky, Tree



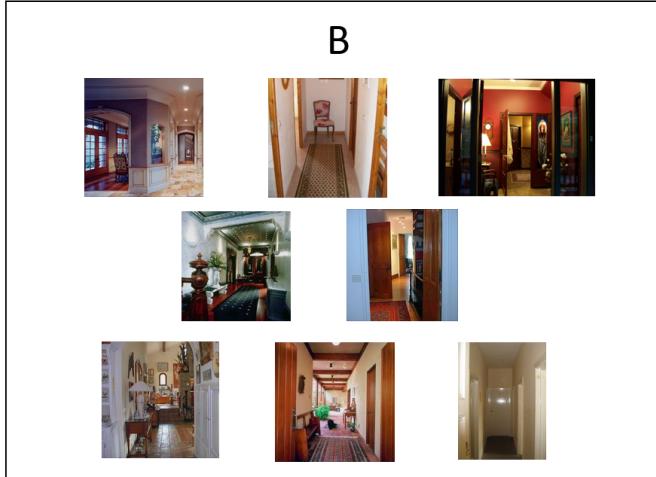
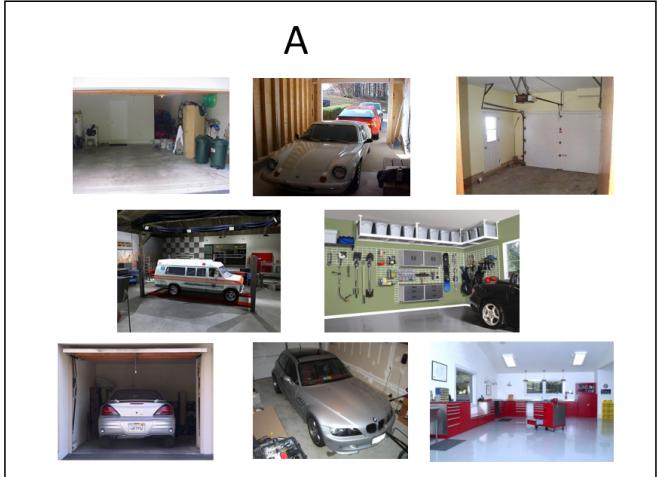
Which of these better represents what the images in group A have that the images in group B do not?

Street Light, Mountain, Fire Hydrant,
Bandstand, Roof, Fence, Water



Culture, Grass, Nature, Roof, Sky, Tree,
Universe





Which of these better represents what the images in group A have that the images in group B do not?

Car, Ceiling, Floor, Garage door, Wall, Wheel, Car, Driving, Garage, Mechanic, Park, Repair, Window



Which of these better represents what the images in group A have that the images in group B do not?

Garage, Car/Automobile, Bicycle,
Outdoor/Backyard, Storage/Toolbox,
Household Utilities, Sports Equipment



Car, Driving, Garage, Mechanic, Park, Repair,
Tool



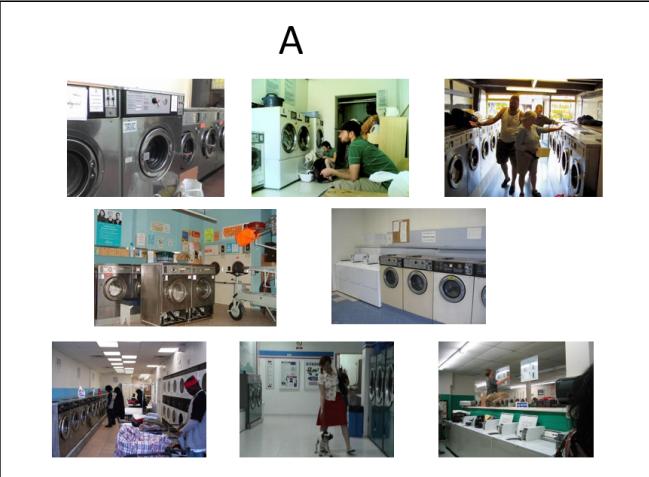
Which of these better represents what the images in group A have that the images in group B do not?

Garage, Car/Automobile, Bicycle,
Outdoor/Backyard, Storage/Toolbox,
Household Utilities, Sports Equipment



Car, Ceiling, Floor, Garage door, Wall, Wheel,
Window



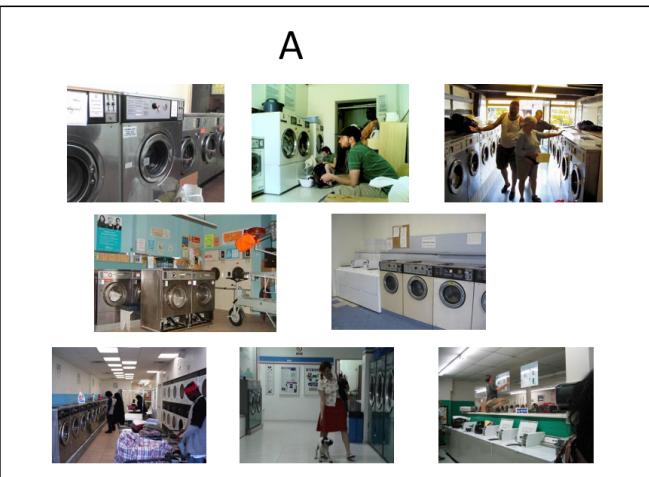


Which of these better represents what the images in group A have that the images in group B do not?

Business, Clothing, Dryer, Human, Laundromat, Laundry, Washing machine



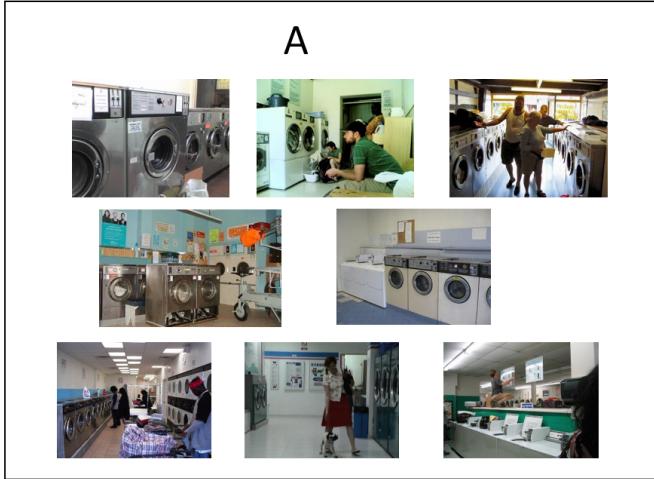
Bulletin board, Door, Floor, Person, Wall, Washing machine, Window



Which of these better represents what the images in group A have that the images in group B do not?

Washing Machine, Tumble Dryer, Fluorescent Tube, Bulletin Board, Soap Bottle, Button Panel, Strip Light

Business, Clothing, Dryer, Human, Laundromat, Laundry, Washing machine

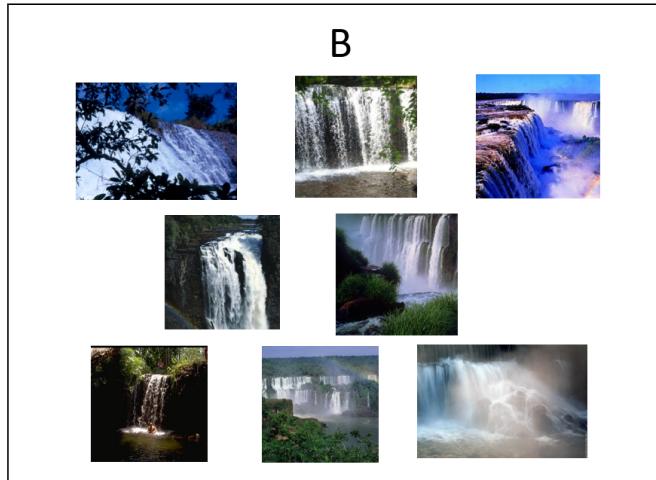
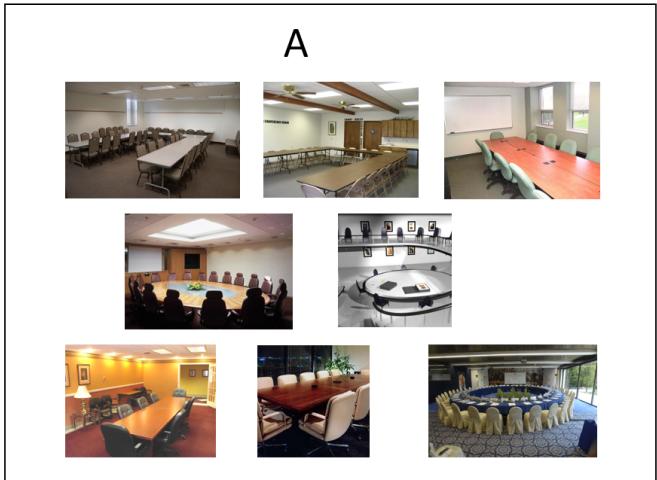


Which of these better represents what the images in group A have that the images in group B do not?

Washing Machine, Tumble Dryer, Fluorescent Tube, Bulletin Board, Soap Bottle, Button Panel, Strip Light

Bulletin board, Door, Floor, Person, Wall, Washing machine, Window



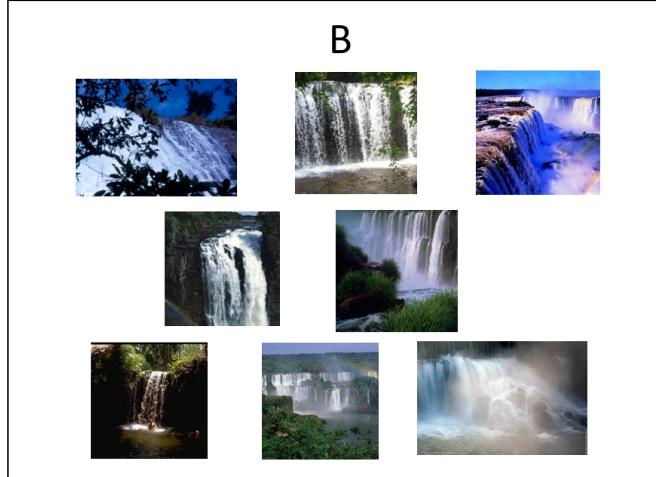
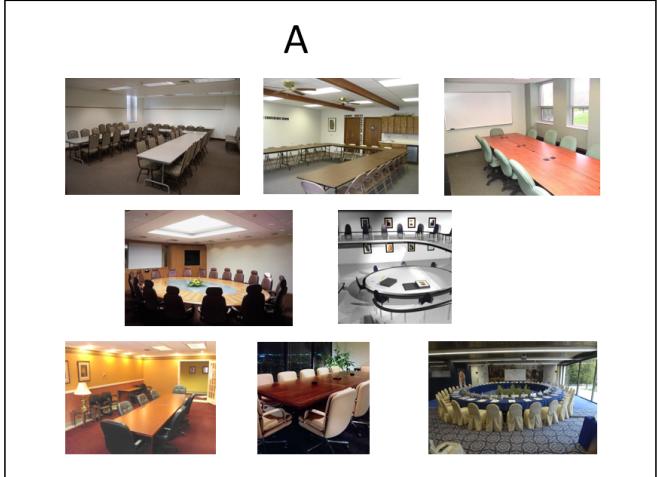


Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Chair, Floor, Scientific problems,
Swivel chair, Wall, Window



Boardroom, Chair, Conference room, Indoor,
Room, Table, Work

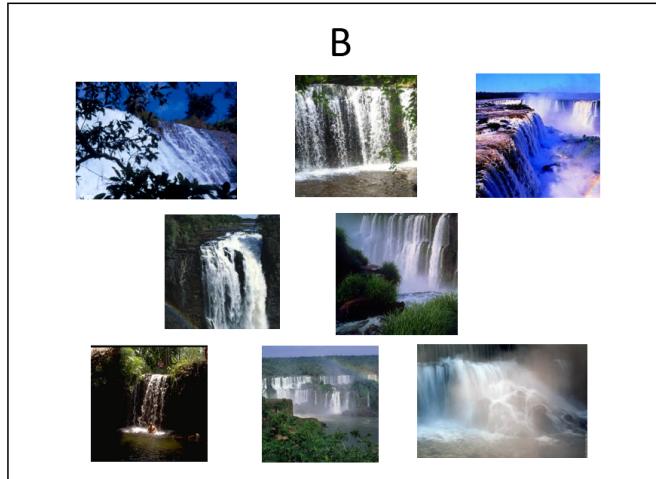
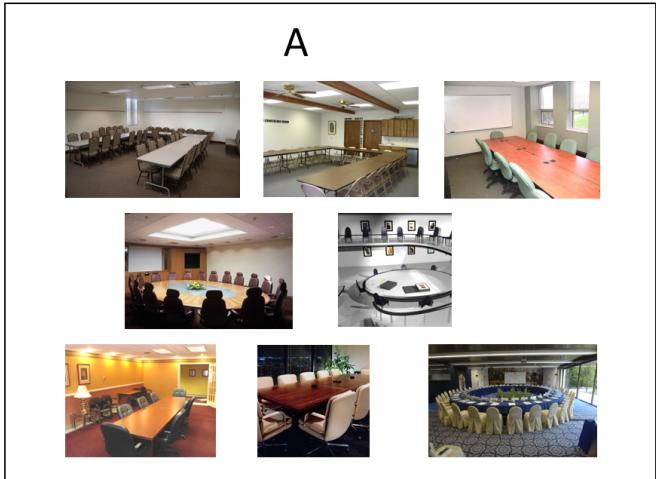


Which of these better represents what the images in group A have that the images in group B do not?

Interior Decor, Furniture, Electronics,
Lighting, Household Items, Office Supplies,
Art and Decorations



Boardroom, Chair, Conference room, Indoor,
Room, Table, Work



Which of these better represents what the images in group A have that the images in group B do not?

Interior Decor, Furniture, Electronics,
Lighting, Household Items, Office Supplies,
Art and Decorations



Ceiling, Chair, Floor, Scientific problems,
Swivel chair, Wall, Window



A



B



Which of these better represents what the images in group A have that the images in group B do not?

Computer, Desk, Keyboard, Monitor, Office, Printer, Work



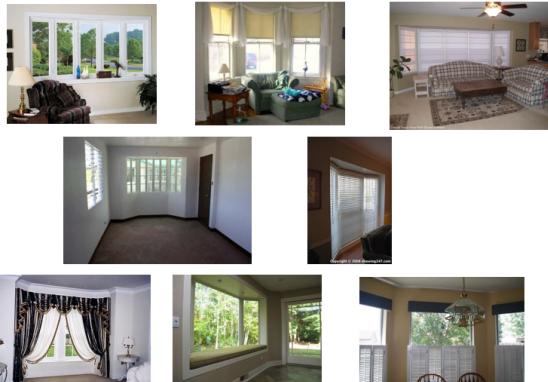
Chair, Computer, Desk, Floor, Humanities, Mouse, Wall



A

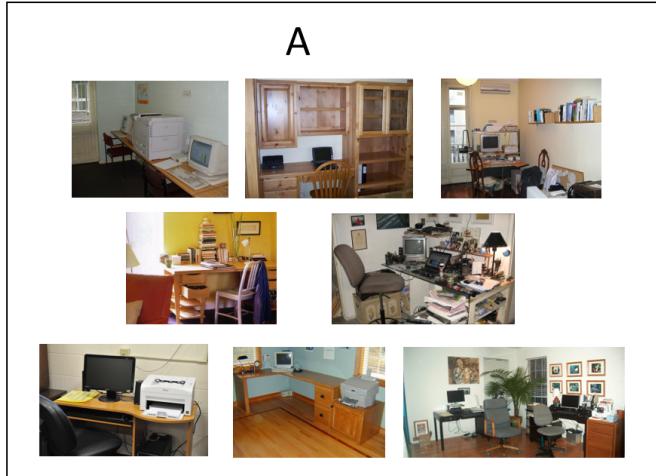


B



Which of these better represents what the images in group A have that the images in group B do not?

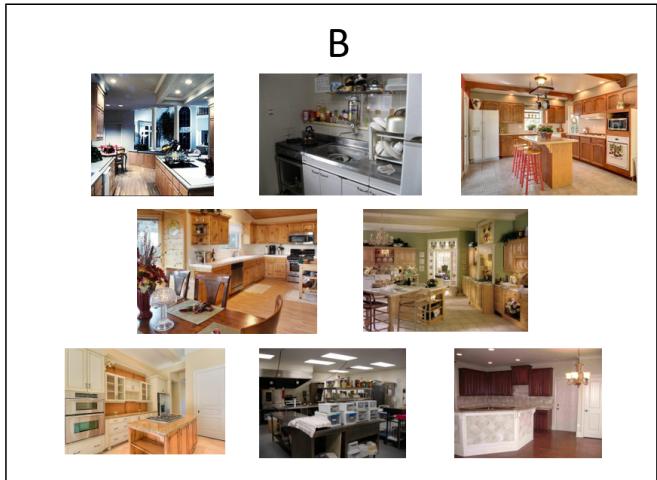
Computer, Desk, Keyboard, Monitor, Office, Computer, Desk, Printer, Keyboard, Monitor,
Printer, Work Telephone, Mouse



Which of these better represents what the images in group A have that the images in group B do not?

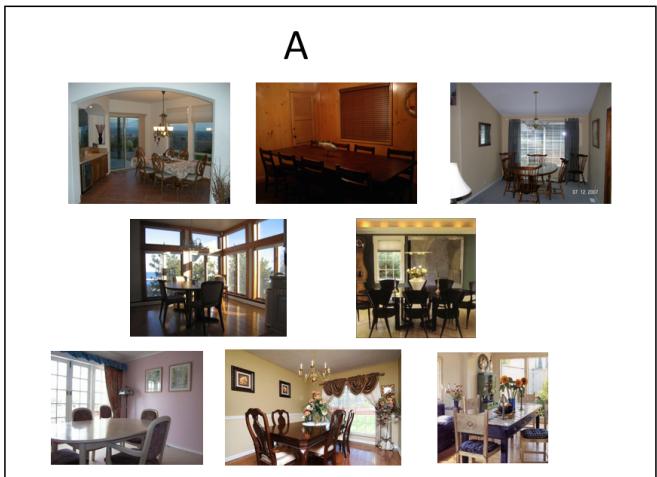
Computer, Desk, Printer, Keyboard, Monitor, Chair, Computer, Desk, Floor, Humanities,
Telephone, Mouse Mouse, Wall





Which of these better represents what the images in group A have that the images in group B do not?

Art, Dining room, Eat, Family, Lamp, Painting, Chair, Chandelier, Curtain, Floor, Mirror, Wall, Relax



Which of these better represents what the images in group A have that the images in group B do not?

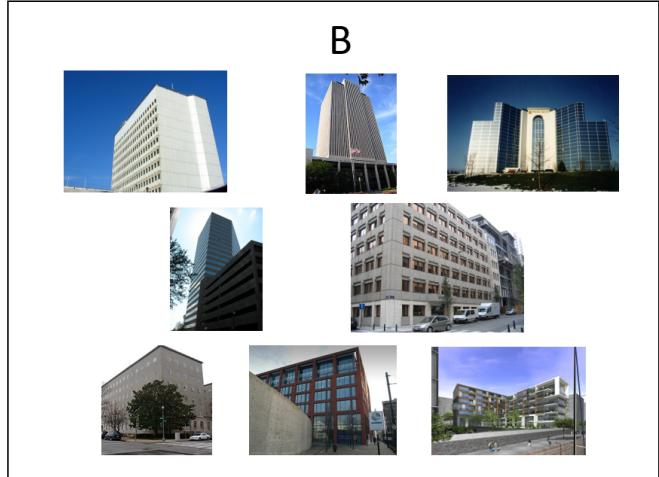
Art, Dining room, Eat, Family, Lamp, Painting, Chandelier, Curtain, Wall Socket, Painting, Relax Picture, Windowpane, Door Frame



Which of these better represents what the images in group A have that the images in group B do not?

Chair, Chandelier, Curtain, Floor, Mirror, Wall, Chandelier, Curtain, Wall Socket, Painting, Window Picture, Windowpane, Door Frame



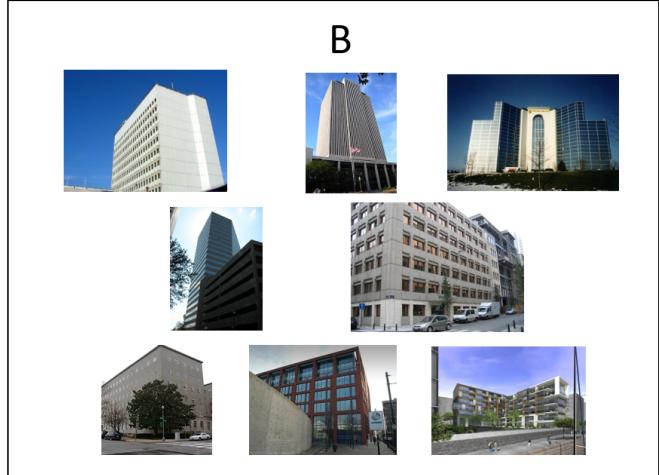


Which of these better represents what the images in group A have that the images in group B do not?

Dining, Eat, Food, Indoor, Menu, Restaurant, Table
Bulletin board, Ceiling, Floor, Person, Sign, Vending machine, Wall



Wall

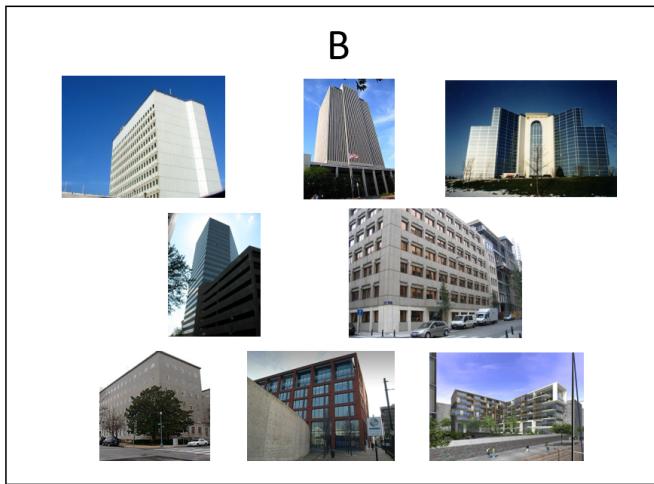
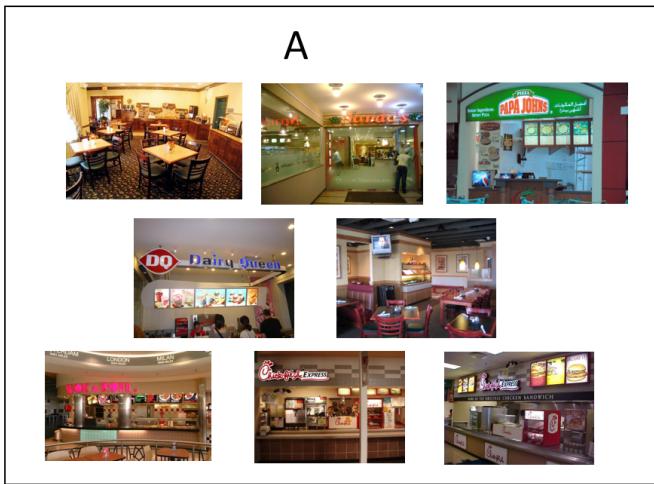


Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Lighting
Fixtures, Electronic Appliances, Display
Cases, Flooring, Wall Decorations



Dining, Eat, Food, Indoor, Menu, Restaurant,
Table



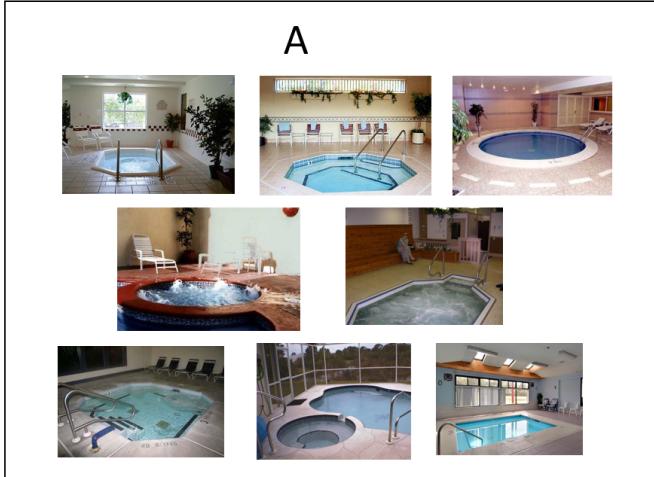
Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Home Decor, Lighting
Fixtures, Electronic Appliances, Display
Cases, Flooring, Wall Decorations



Bulletin board, Ceiling, Floor, Person, Sign,
Vending machine, Wall



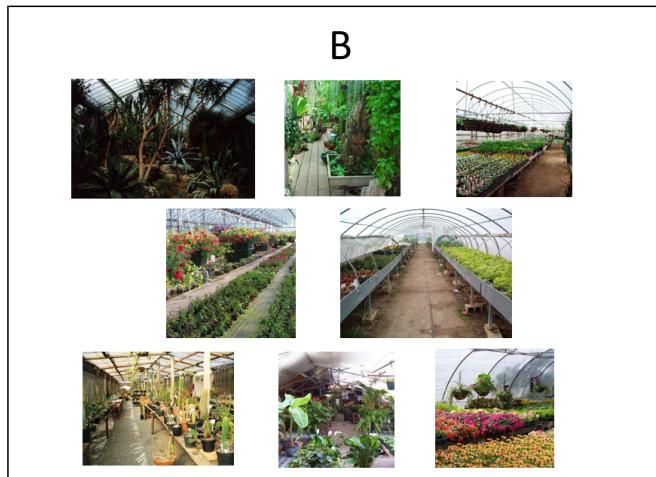
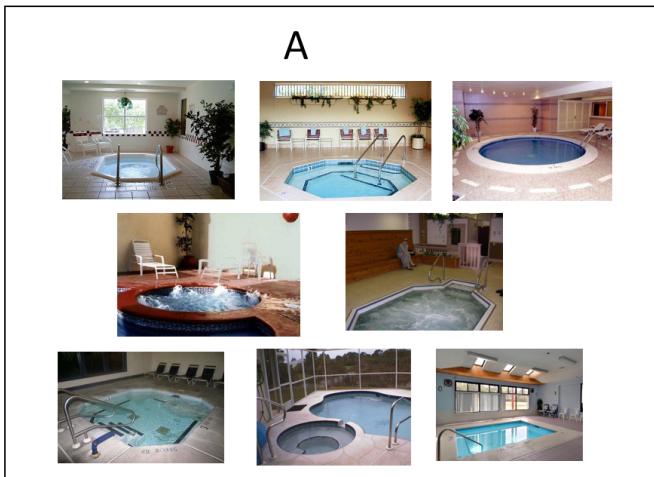


Which of these better represents what the images in group A have that the images in group B do not?

Artificial objects, Condensed matter physics,
Hot tub, Hydroxides, Lubrication, Materials,
Technology



Chair, Handrail, Hot tub, Pool, Swim, Tile,
Water

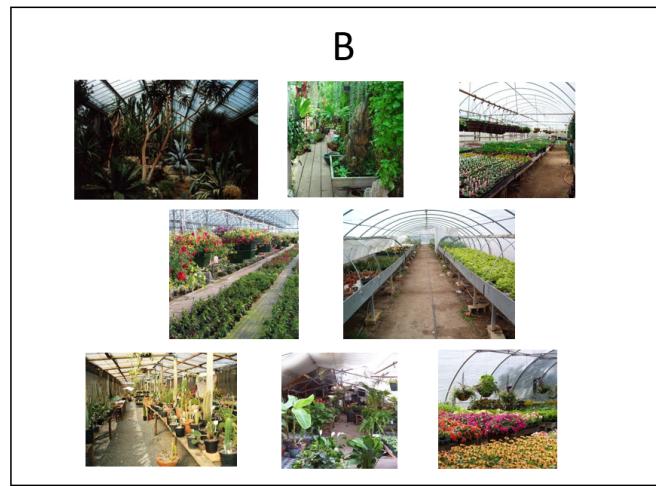
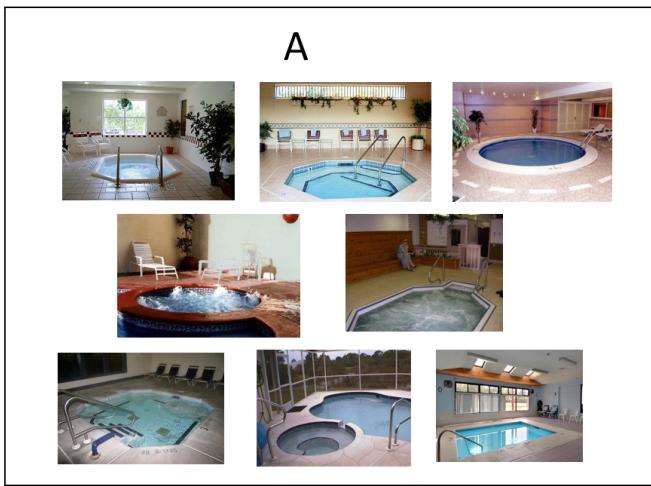


Which of these better represents what the images in group A have that the images in group B do not?

Hot Tub, Shower, Deck Chair, Beach Chair,
Double Door, Ceiling Spotlight, Bulletin
Board



Chair, Handrail, Hot tub, Pool, Swim, Tile,
Water



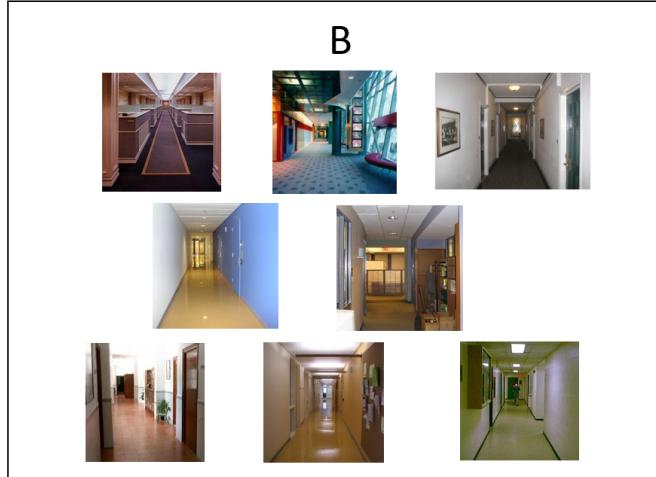
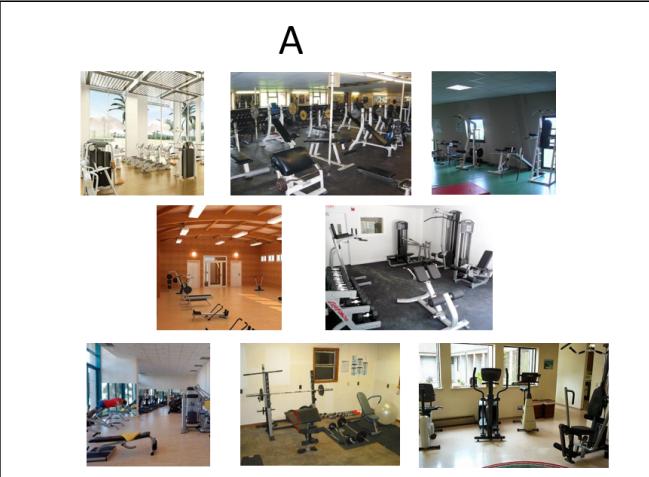
Which of these better represents what the images in group A have that the images in group B do not?

Artificial objects, Condensed matter physics,
Hot tub, Hydroxides, Lubrication, Materials,
Technology



Hot Tub, Shower, Deck Chair, Beach Chair,
Double Door, Ceiling Spotlight, Bulletin
Board



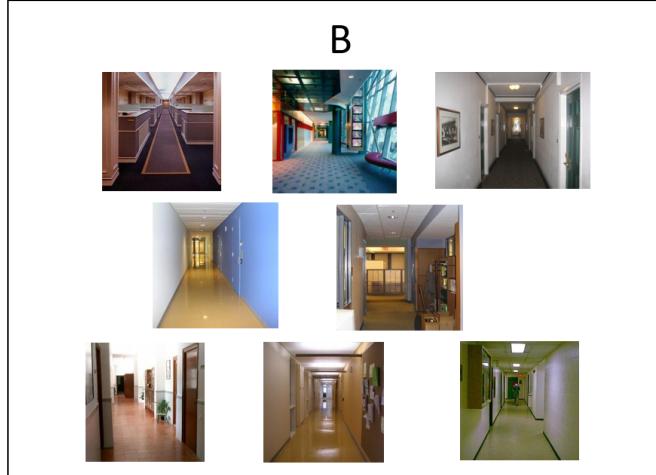


Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Door, Exercise machine, Floor,
Humanities, Wall, Window



Equipment, Exercise, Fitness, Gym, Lift,
Machine, Weights

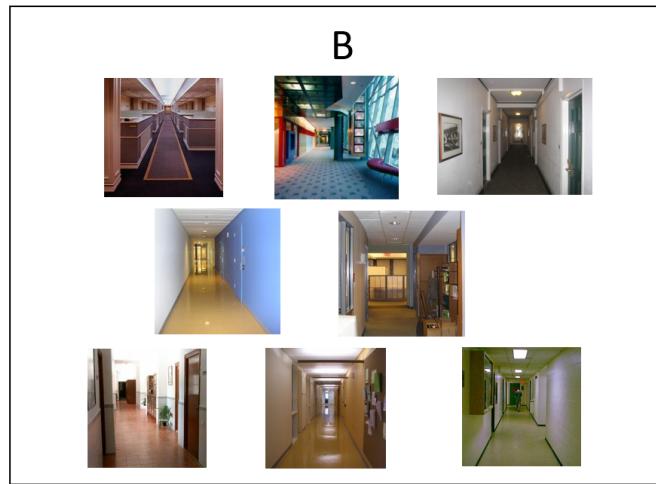


Which of these better represents what the images in group A have that the images in group B do not?

Equipment, Exercise, Fitness, Gym, Lift,
Machine, Weights



Exercise Machine, Dumbbell, Barbell,
Exercise Bike, Treadmills, Television Set,
Fluorescent Fixture



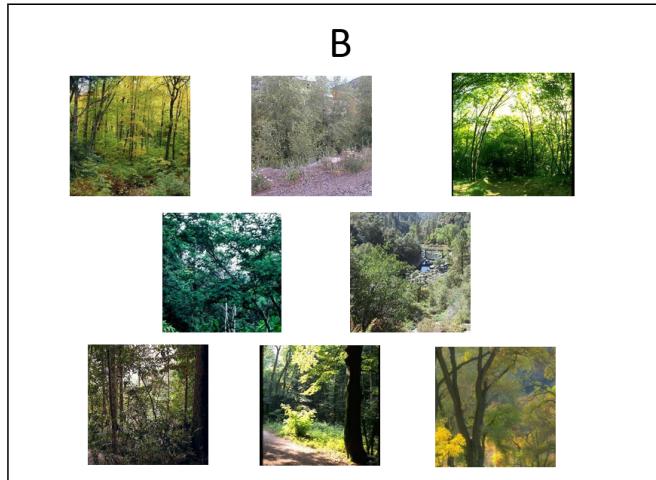
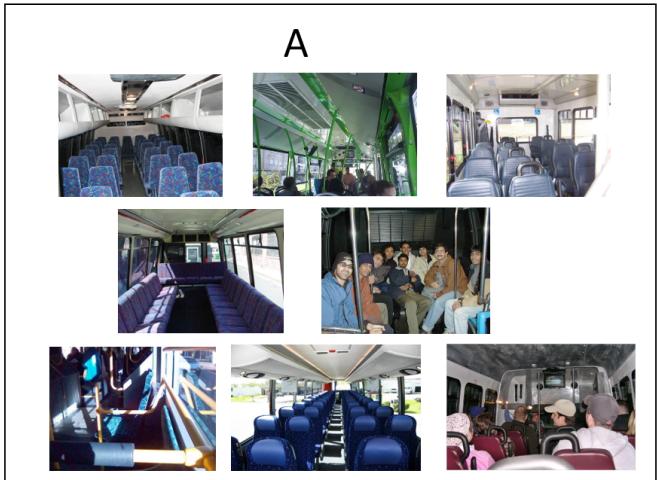
Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Door, Exercise machine, Floor,
Humanities, Wall, Window



Exercise Machine, Dumbbell, Barbell,
Exercise Bike, Treadmills, Television Set,
Fluorescent Fixture



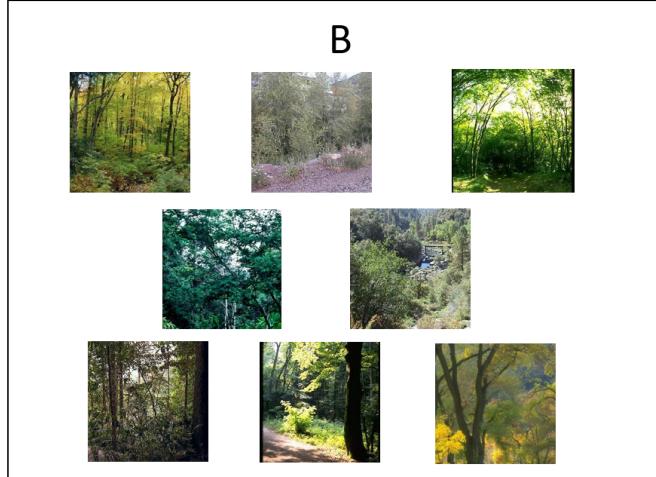
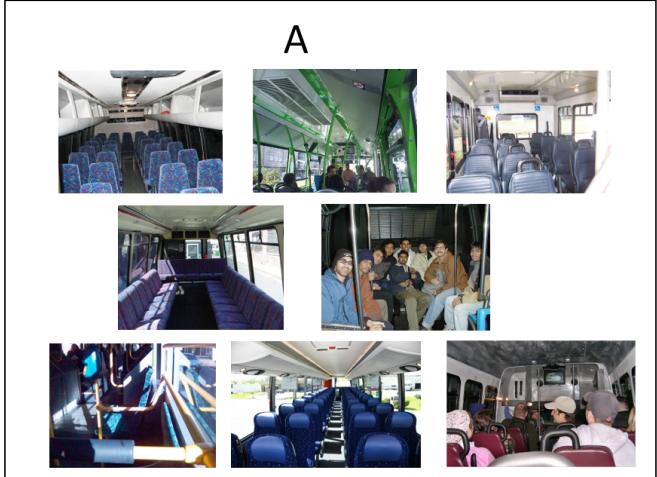


Which of these better represents what the images in group A have that the images in group B do not?

Bus, Drive, Human, Seat, Transport, Vehicle, Window



Ceiling, Floor, Person, Sign, Seat, Wall, Window

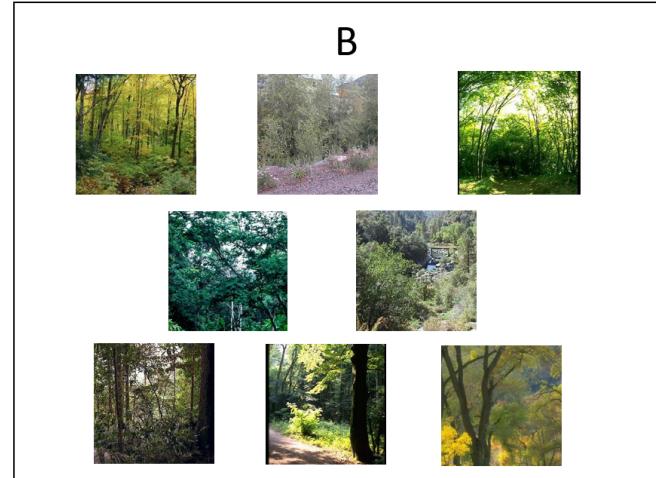
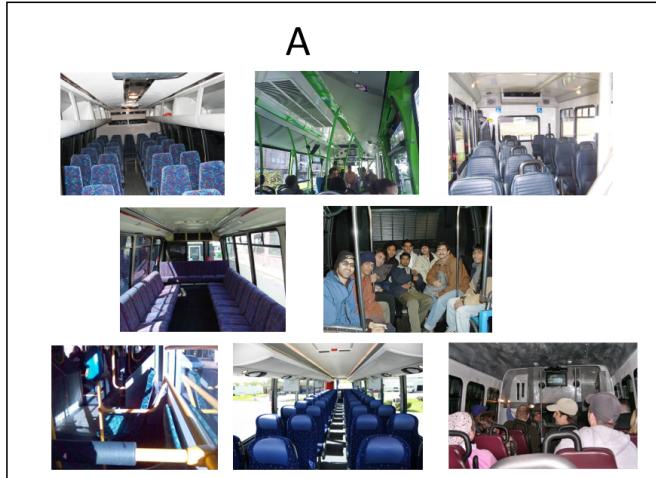


Which of these better represents what the images in group A have that the images in group B do not?

Bus, Drive, Human, Seat, Transport, Vehicle, Window



Handrail, Windowpane, Balustrade, Seats, Divider, Ceiling Recessed Light, Television



Which of these better represents what the images in group A have that the images in group B do not?

Handrail, Windowpane, Balustrade, Seats, Divider, Ceiling Recessed Light, Television



Ceiling, Floor, Person, Sign, Seat, Wall, Window



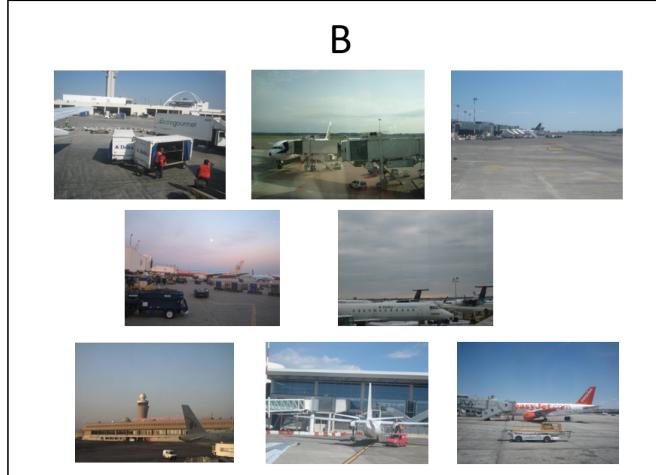


Which of these better represents what the images in group A have that the images in group B do not?

Carpet, Casino, Gambling, Game, Indoor, Money, Slot machine



Ceiling, Chair, Floor, Person, Science, Slot machine, Wall



Which of these better represents what the images in group A have that the images in group B do not?

Arcade Machine, Slot Machine, Table Game,
Drinking Glass, Monitor, Ceiling Recessed
Light, Pendant Lamp

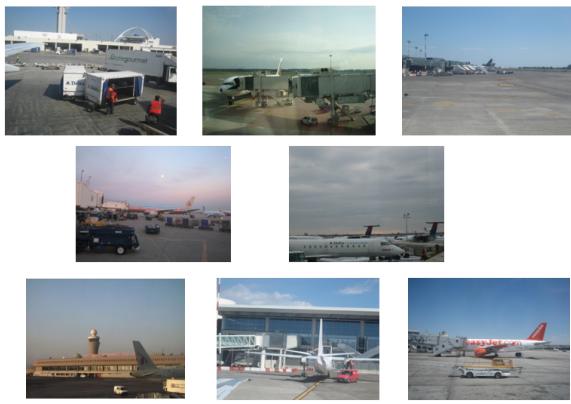
Carpet, Casino, Gambling, Game, Indoor,
Money, Slot machine



A



B

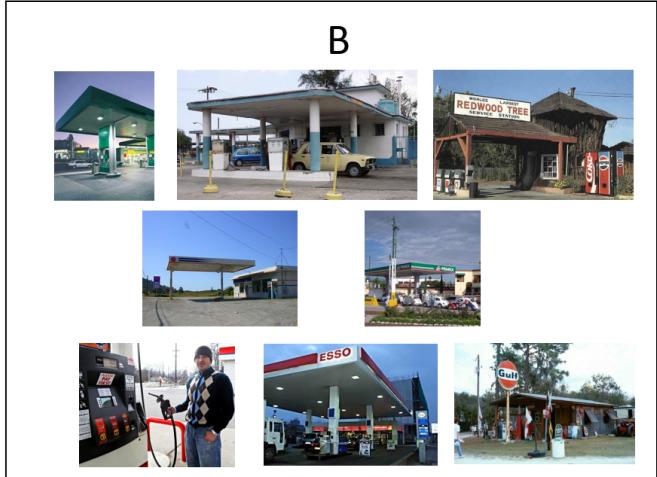


Which of these better represents what the images in group A have that the images in group B do not?

Arcade Machine, Slot Machine, Table Game,
Drinking Glass, Monitor, Ceiling Recessed
Light, Pendant Lamp

Ceiling, Chair, Floor, Person, Science, Slot
machine, Wall



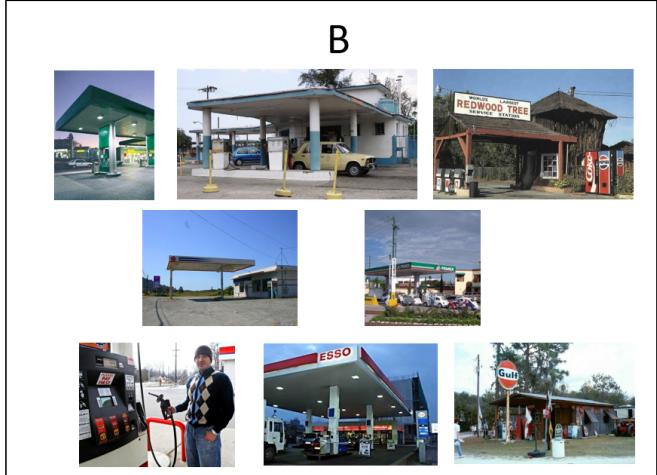


Which of these better represents what the images in group A have that the images in group B do not?

Bookcase, Ceiling, Chair, Desk, Floor, Wall, Window



Book, Chair, Indoor, Library, Read, Study, Table

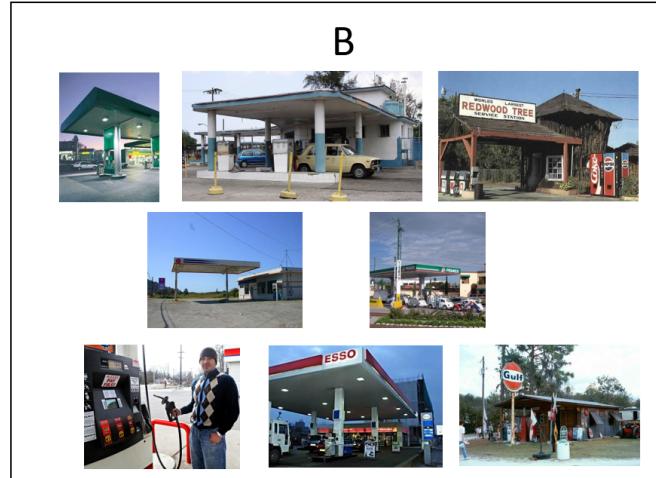


Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Office Environment,
Bookcase, Desk, Armchair, Sofa, Staircase



Book, Chair, Indoor, Library, Read, Study,
Table



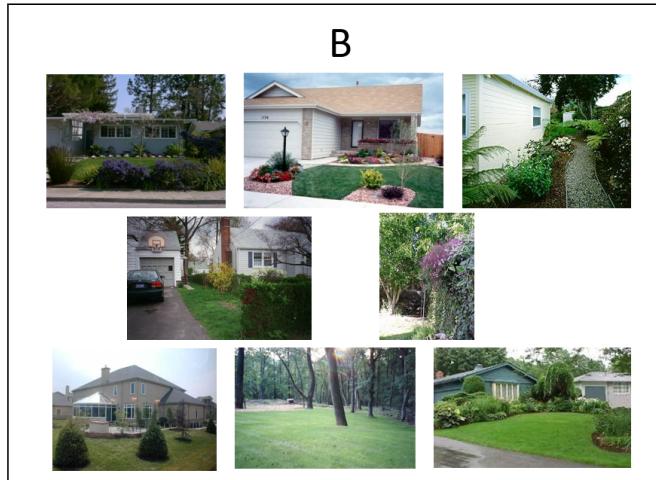
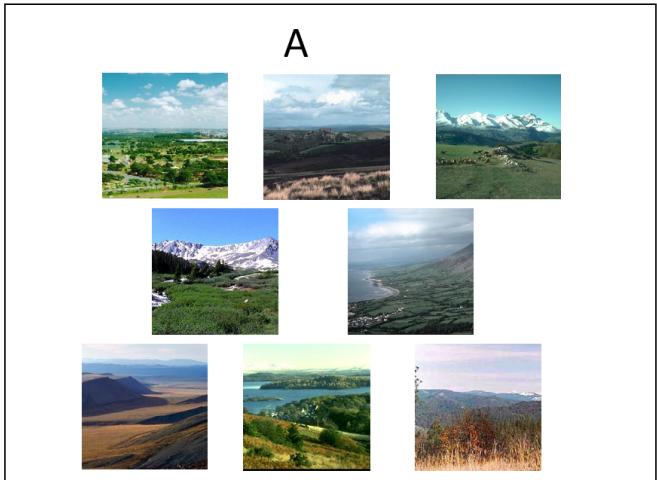
Which of these better represents what the images in group A have that the images in group B do not?

Indoor Furniture, Office Environment,
Bookcase, Desk, Armchair, Sofa, Staircase



Bookcase, Ceiling, Chair, Desk, Floor, Wall,
Window



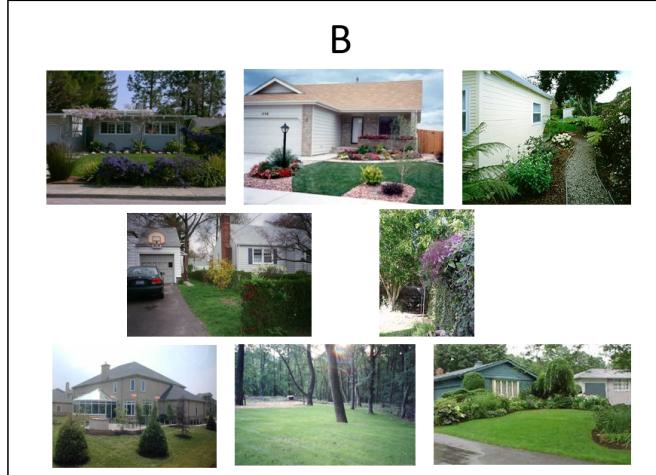
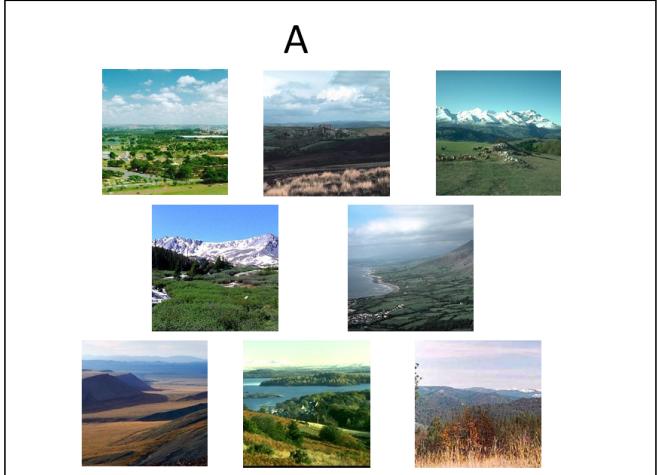


Which of these better represents what the images in group A have that the images in group B do not?

Building, Culture, Economy, Mountain,
Nature, Sky, Universe



Desert, Hill, Mountain, Scenic, Snow,
Uninhabited, Water



Which of these better represents what the images in group A have that the images in group B do not?

Desert, Hill, Mountain, Scenic, Snow,
Uninhabited, Water



Sea water, Sea, Mountain, Rocks, Stone,
Castle, Sheep



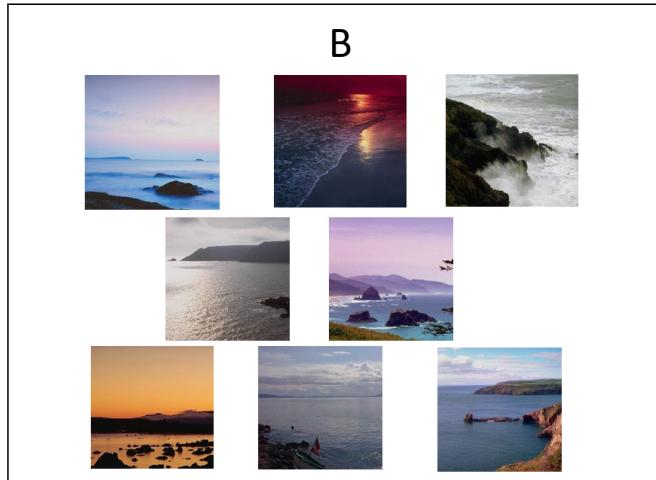
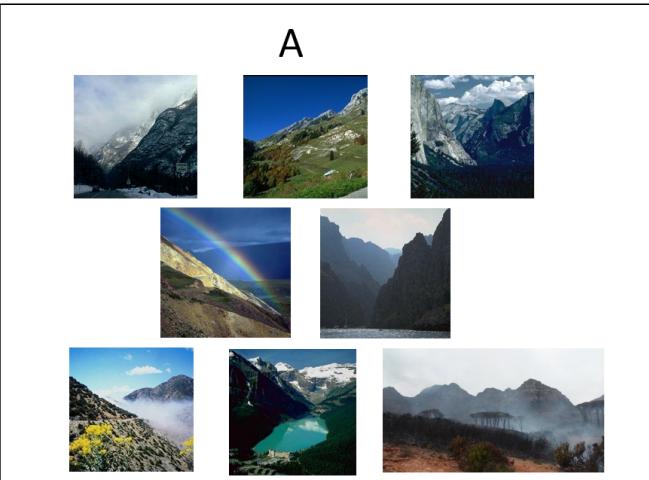
Which of these better represents what the images in group A have that the images in group B do not?

Building, Culture, Economy, Mountain,
Nature, Sky, Universe



Sea water, Sea, Mountain, Rocks, Stone,
Castle, Sheep



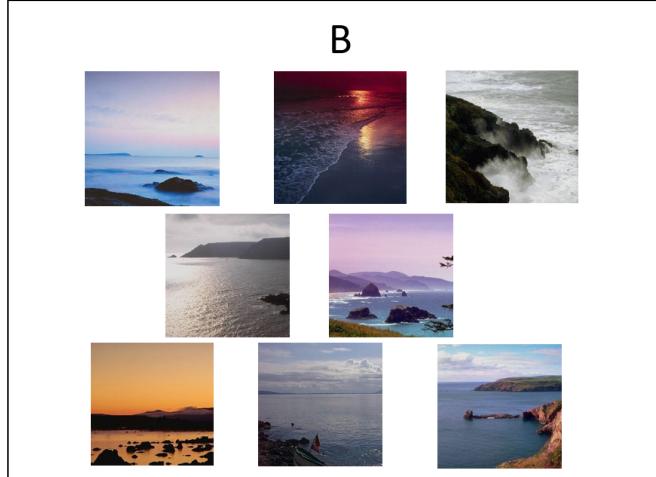
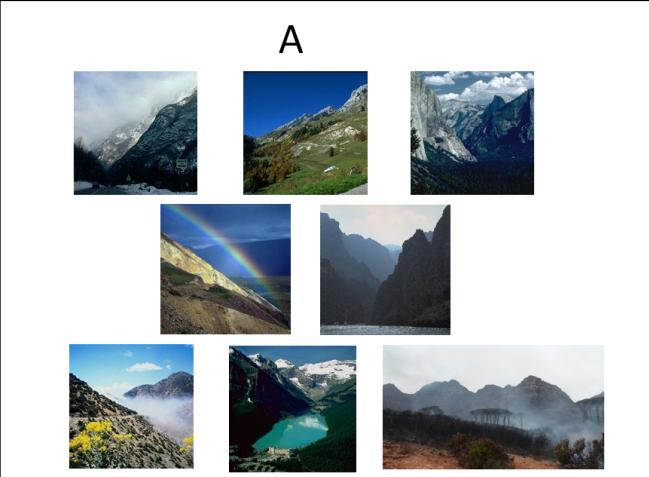


Which of these better represents what the images in group A have that the images in group B do not?

Automobile, Inland, Lake, Mountain,
Rainbow, Snow, Valley



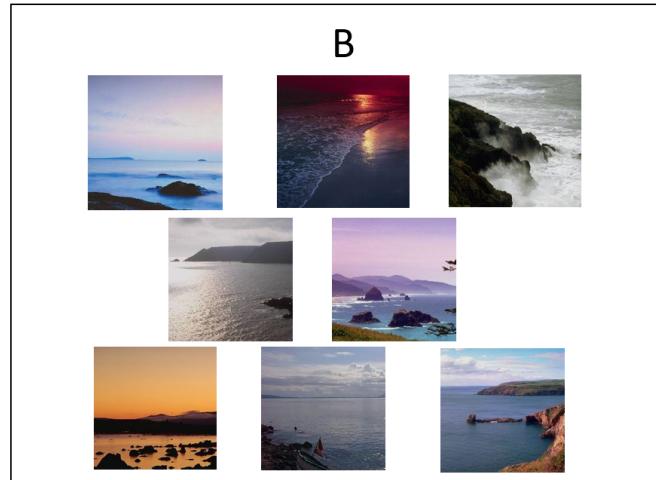
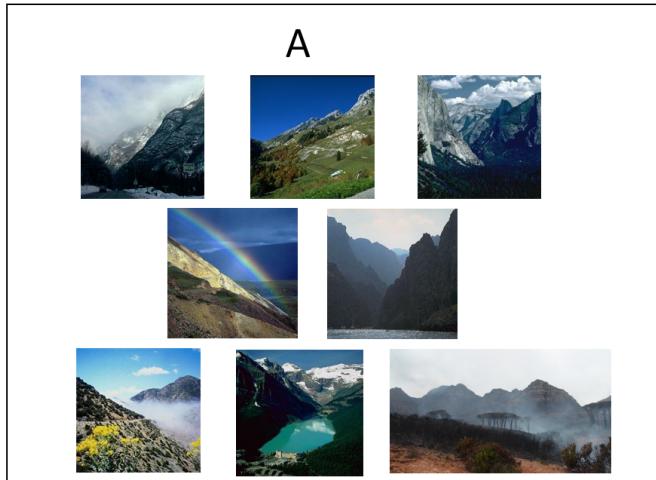
Concepts, Mountain, Nature, Road, Sky,
Society, Universe



Which of these better represents what the images in group A have that the images in group B do not?

Rainbow, Vale, Valley, Fog bank, Automobile,
Street light, Signboard

Automobile, Inland, Lake, Mountain,
Rainbow, Snow, Valley



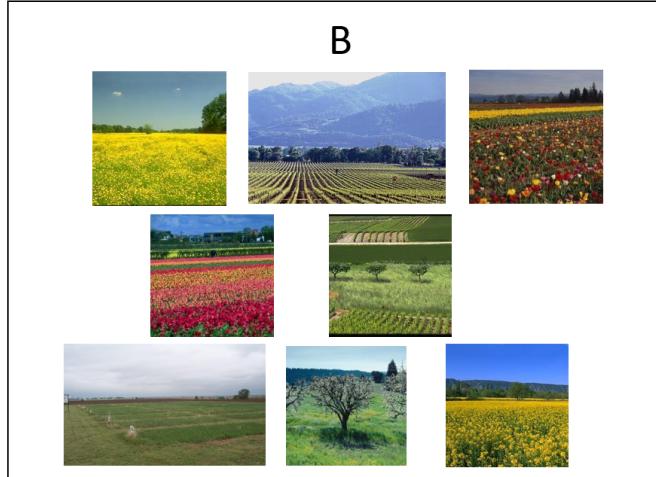
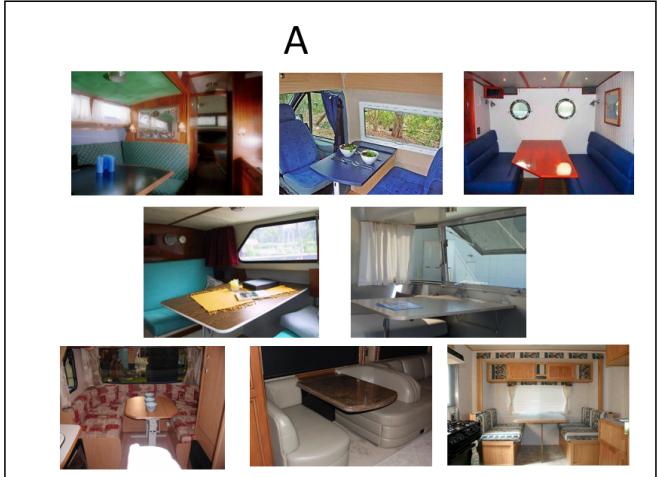
Which of these better represents what the images in group A have that the images in group B do not?

Concepts, Mountain, Nature, Road, Sky,
Society, Universe



Rainbow, Vale, Valley, Fog bank, Automobile,
Street light, Signboard





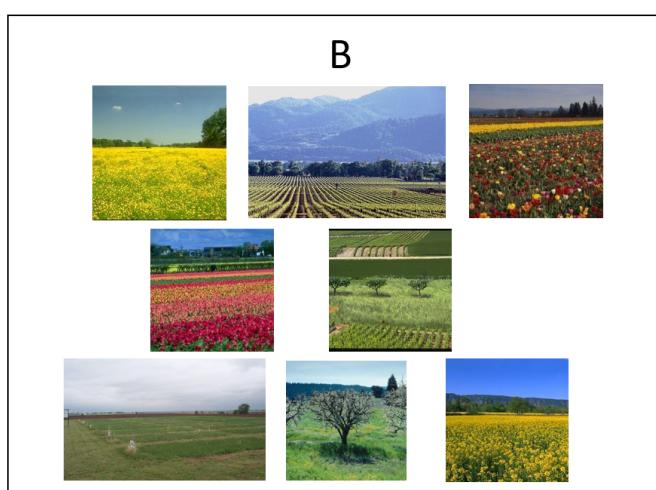
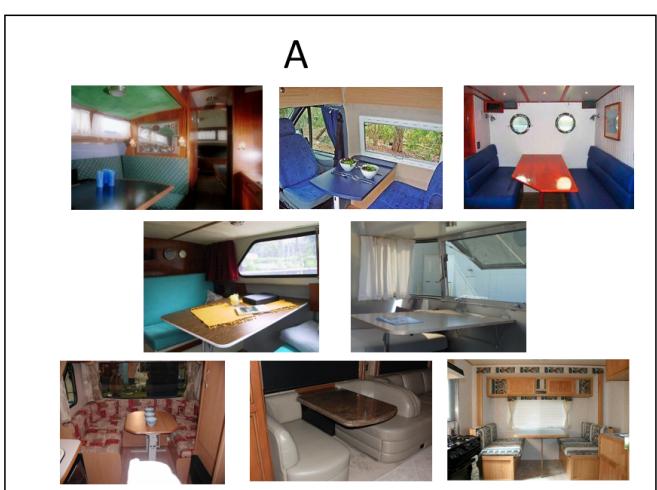
Which of these better represents what the images in group A have that the images in group B do not?

Booth, Camp, Dining, Indoor, Seat, Table, Window



Ceiling, Curtain, Door, Floor, Seat, Wall,

Window

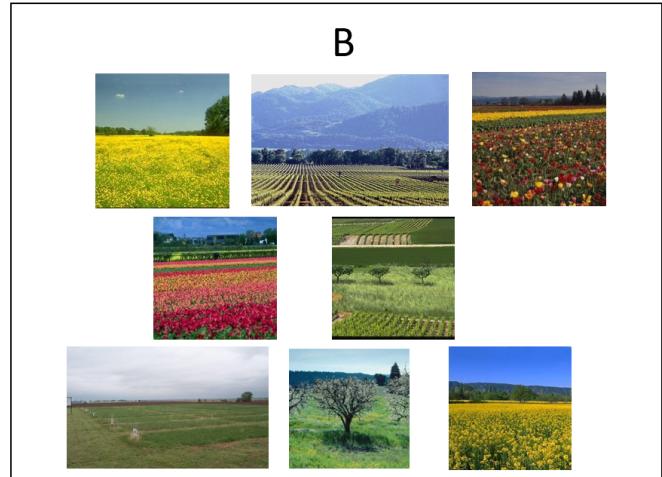
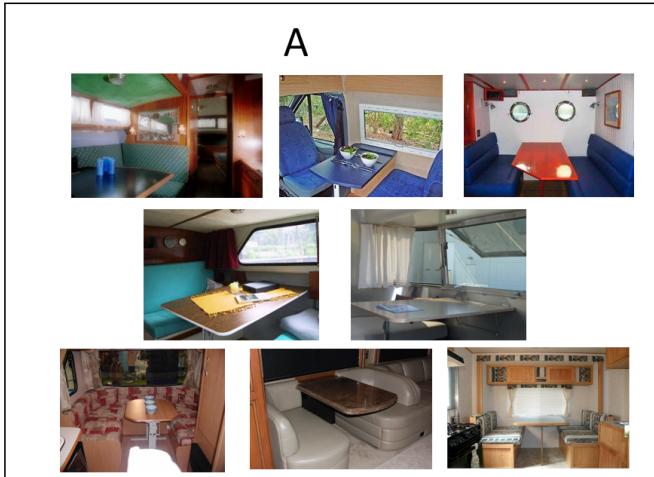


Which of these better represents what the images in group A have that the images in group B do not?

Ceiling Recessed Light, Loudspeaker System, Seat Cushion, Windowpane, Semi flush Mount Light, Kitchen Stove, Wardrobe



Booth, Camp, Dining, Indoor, Seat, Table, Window



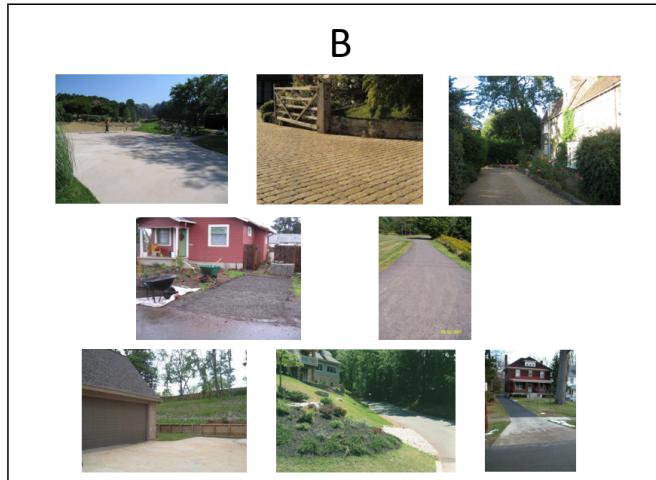
Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Curtain, Door, Floor, Seat, Wall, Window



Ceiling Recessed Light, Loudspeaker System, Seat Cushion, Windowpane, Semi flush Mount Light, Kitchen Stove, Wardrobe



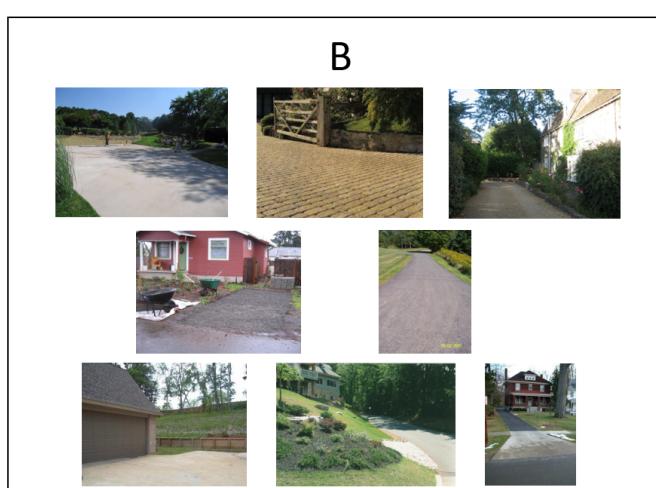


Which of these better represents what the images in group A have that the images in group B do not?

Chair, Floor, Game, Indoor, Light fixture,
Recreation, Table



Billiard table, Ceiling, Chair, Floor, Person,
Wall, Window



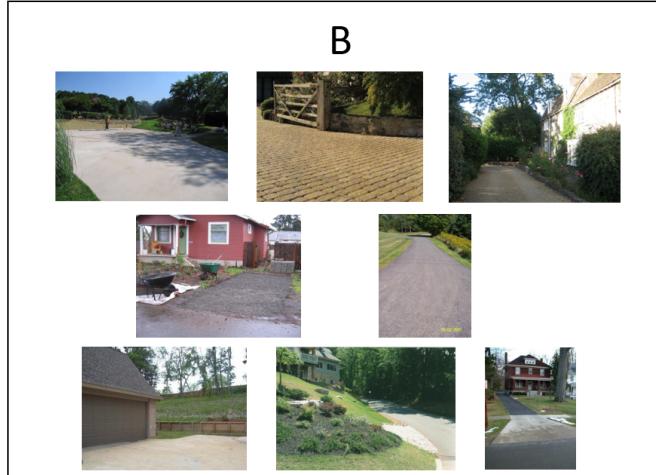
Which of these better represents what the images in group A have that the images in group B do not?

Billiard Table, Television, Pool Table, Cue Stick, Slot Machine, Ceiling Fan, Fluorescent Fixture

Fixture



Chair, Floor, Game, Indoor, Light fixture, Recreation, Table



Which of these better represents what the images in group A have that the images in group B do not?

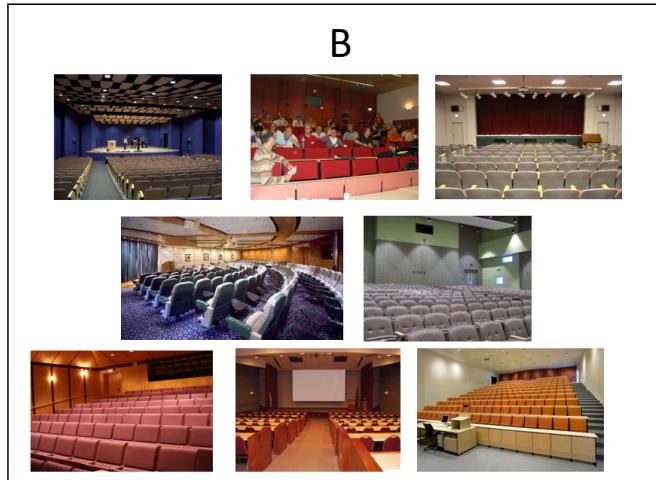
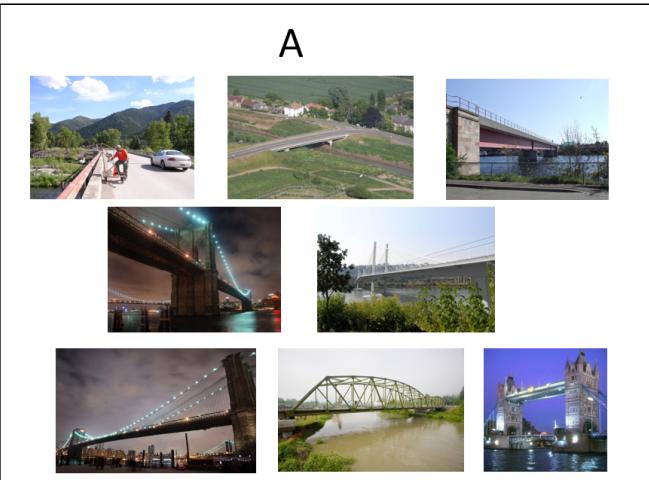
Billiard Table, Television, Pool Table, Cue Stick, Slot Machine, Ceiling Fan, Fluorescent Fixture

Fixture



Billiard table, Ceiling, Chair, Floor, Person, Wall, Window



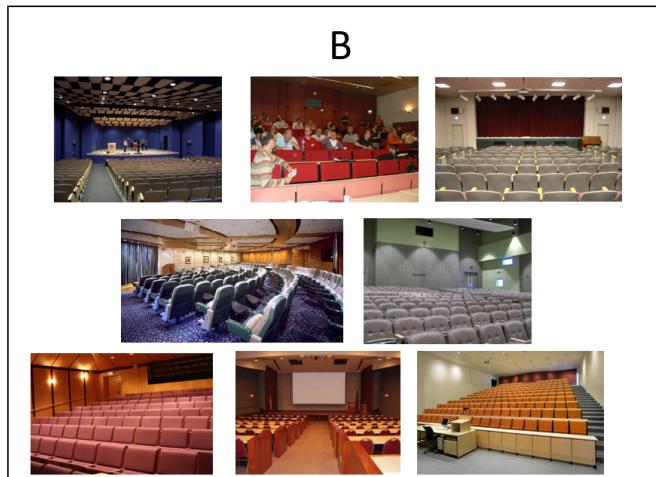
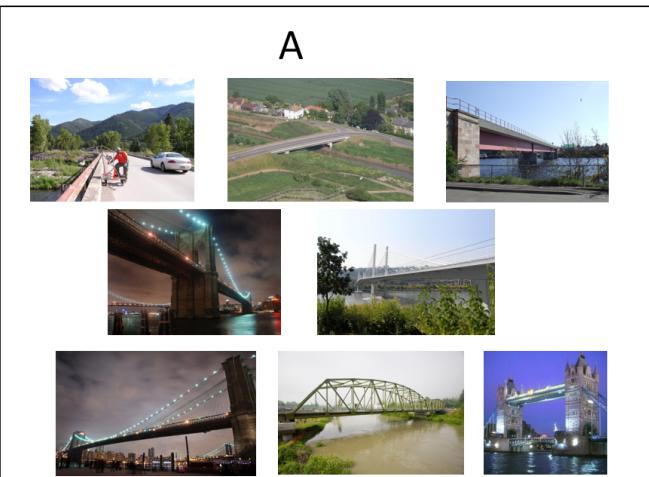


Which of these better represents what the images in group A have that the images in group B do not?

Automobile, Bridge, Drive, Outdoor, River, Road, Water



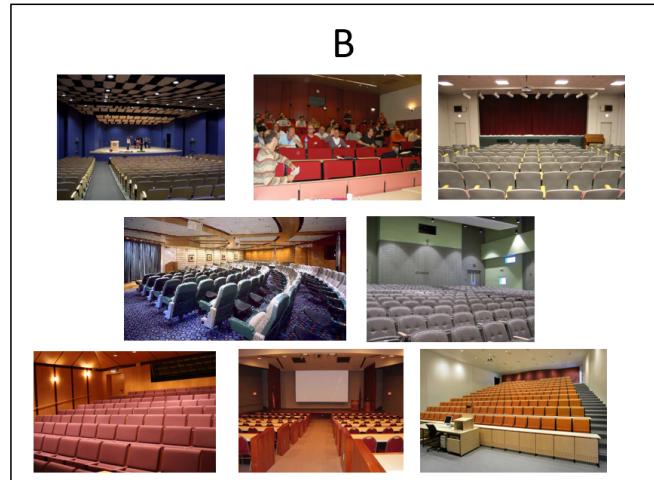
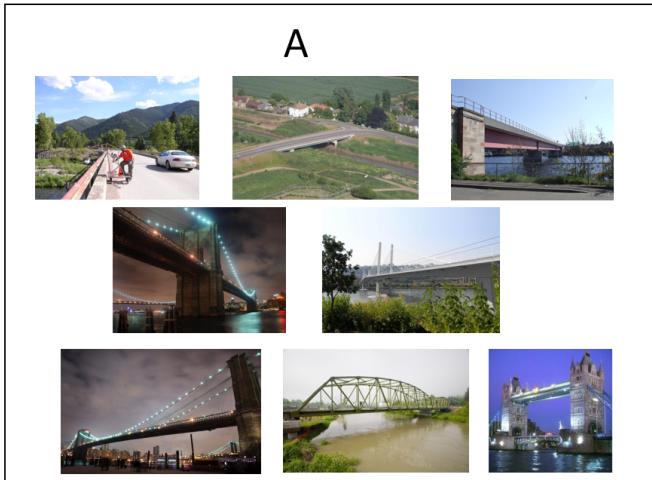
Bridge, Culture, Foods, Lubrication, Nature, Sky, Universe



Which of these better represents what the images in group A have that the images in group B do not?

Outdoor Scenery, Bridges, Mountains, Water bodies, Vehicles, Street Elements, Flora

Automobile, Bridge, Drive, Outdoor, River, Road, Water

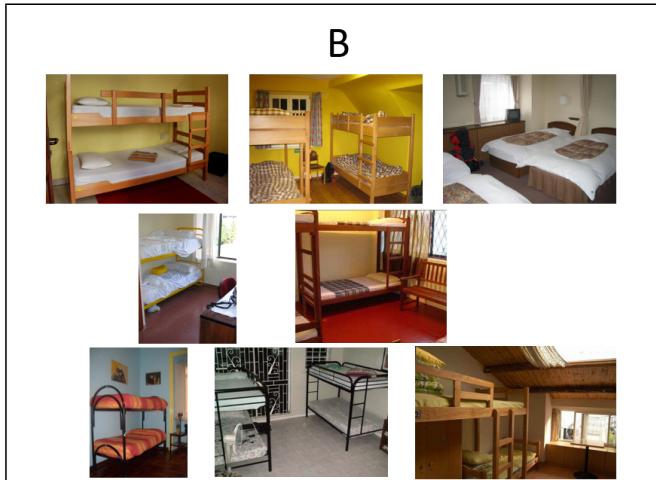
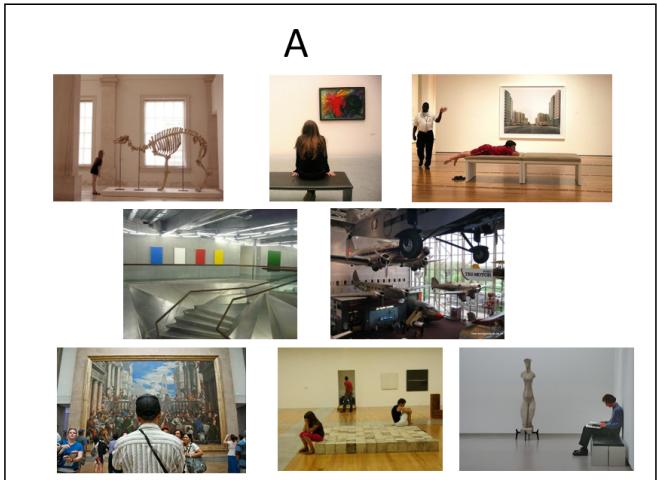


Which of these better represents what the images in group A have that the images in group B do not?

Outdoor Scenery, Bridges, Mountains, Water bodies, Vehicles, Street Elements, Flora

Bridge, Culture, Foods, Lubrication, Nature, Sky, Universe



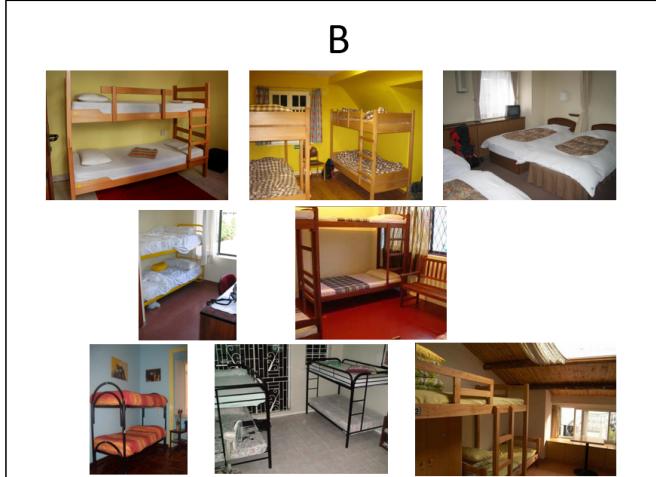


Which of these better represents what the images in group A have that the images in group B do not?

Arts, Ceiling, Culture, Floor, Humanities,
Person, Wall



Art, Business, Exhibit, Human, Museum,
Observe, Skeleton

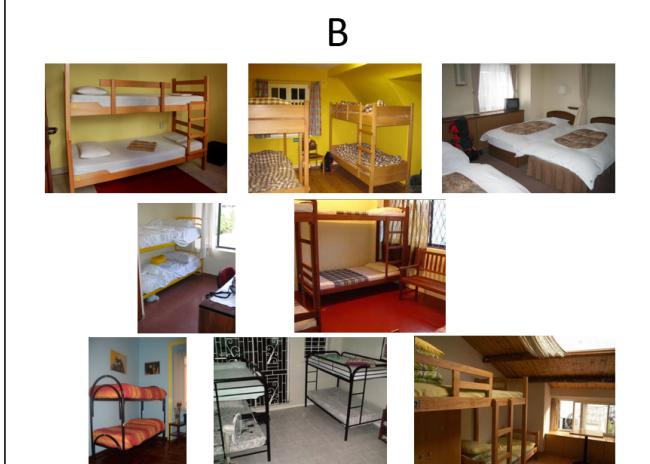


Which of these better represents what the images in group A have that the images in group B do not?

Airplane, Monitors, Tower, Sculpture,
Signboard, Fluorescent tube, Skeleton



Art, Business, Exhibit, Human, Museum,
Observe, Skeleton



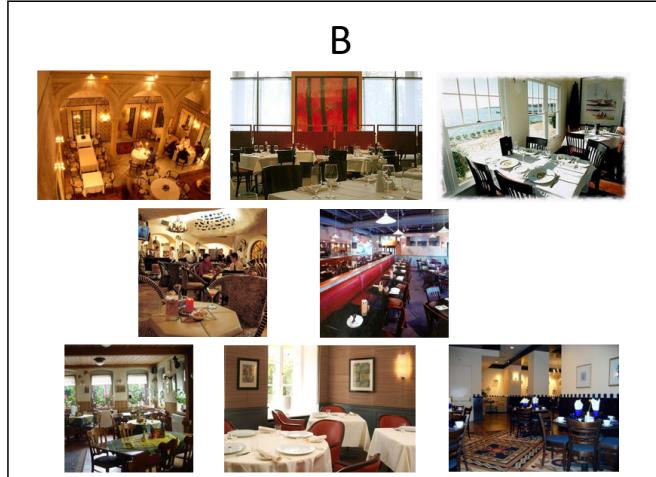
Which of these better represents what the images in group A have that the images in group B do not?

Airplane, Monitors, Tower, Sculpture,
Signboard, Fluorescent tube, Skeleton



Arts, Ceiling, Culture, Floor, Humanities,
Person, Wall



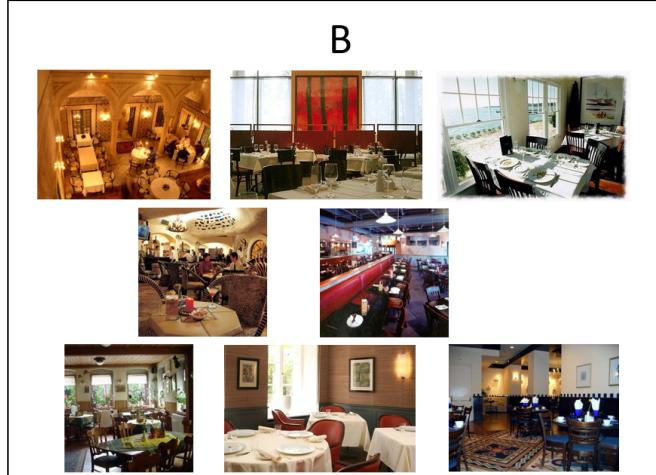


Which of these better represents what the images in group A have that the images in group B do not?

Aisle, Grocery, Market, Produce, Shop, Store, Shelf



Bag, Ceiling, Floor, Person, Shopping cart, Sign, Stand

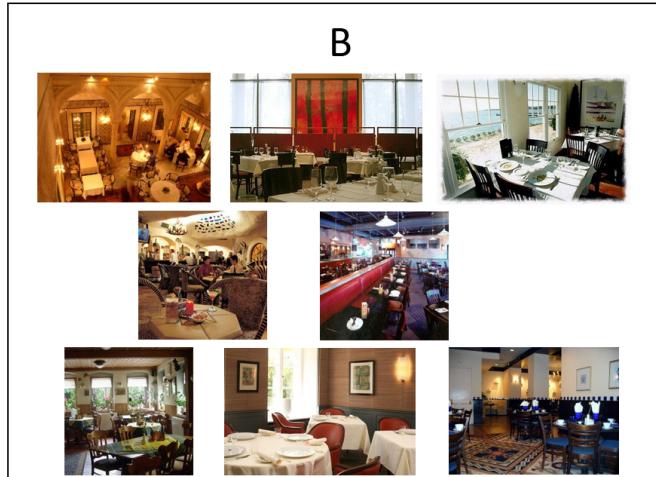


Which of these better represents what the images in group A have that the images in group B do not?

Aisle, Grocery, Market, Produce, Shop, Store, Shelf



Supermarket, Grocery Store, Shopping Centre, Retail Store, Cash Register, Shopping Cart, Produce Section



Which of these better represents what the images in group A have that the images in group B do not?

Supermarket, Grocery Store, Shopping Centre, Retail Store, Cash Register, Shopping Cart, Produce Section



Bag, Ceiling, Floor, Person, Shopping cart, Sign, Stand





Which of these better represents what the images in group A have that the images in group B do not?

Chair, Classroom, Desk, Learn, Lecture,
Table, Teach



Ceiling, Chair, Desk, Floor, Poster, Wall,
Window



Which of these better represents what the images in group A have that the images in group B do not?

Classroom, Office, Computer Lab, Living Room, Kitchen, Bedroom, Conference Room



Chair, Classroom, Desk, Learn, Lecture, Table, Teach



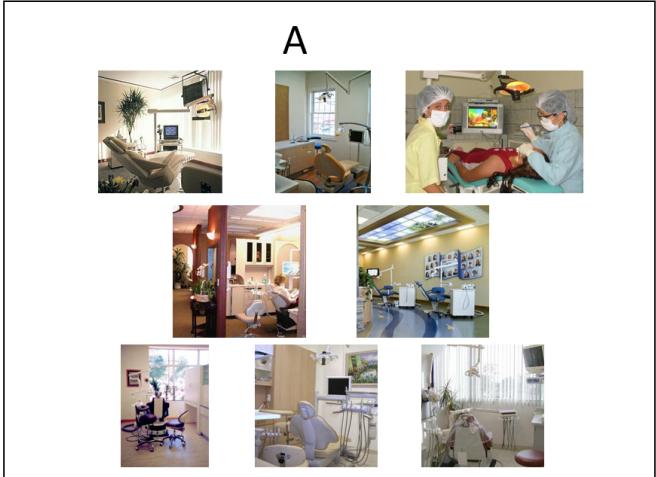
Which of these better represents what the images in group A have that the images in group B do not?

Classroom, Office, Computer Lab, Living Room, Kitchen, Bedroom, Conference Room



Ceiling, Chair, Desk, Floor, Poster, Wall, Window



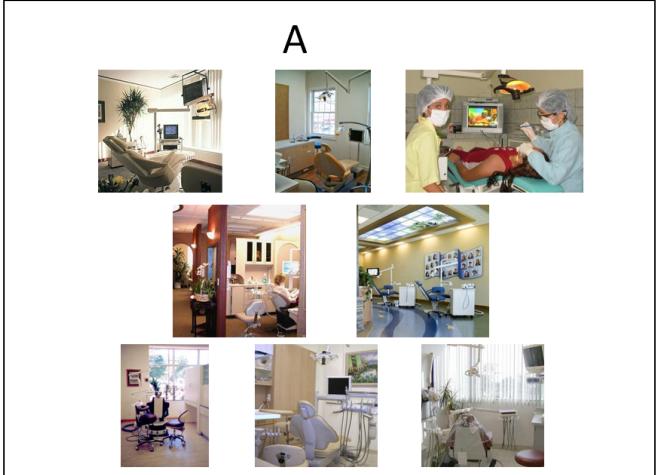


Which of these better represents what the images in group A have that the images in group B do not?

Computer, Dental chair, Dentist, Medicine, Monitor, Office, Television



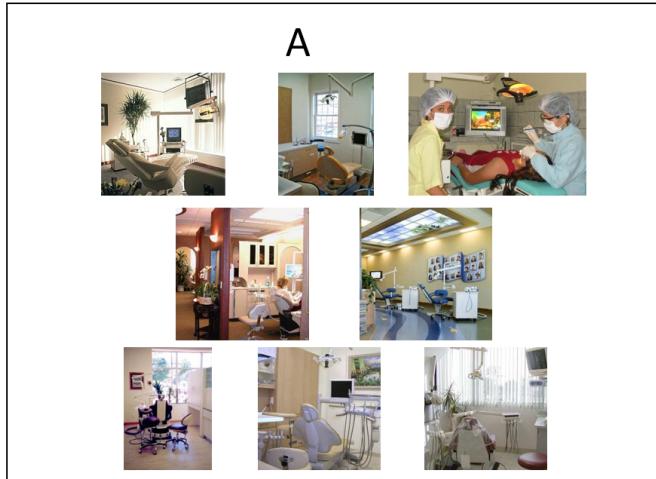
Ceiling, Chair, Floor, Humanities, Plant, Wall, Window



Which of these better represents what the images in group A have that the images in group B do not?

Television, CD Player, Dental Chair, Set of Instruments, Articulated Lamp, Faucet, Outlet

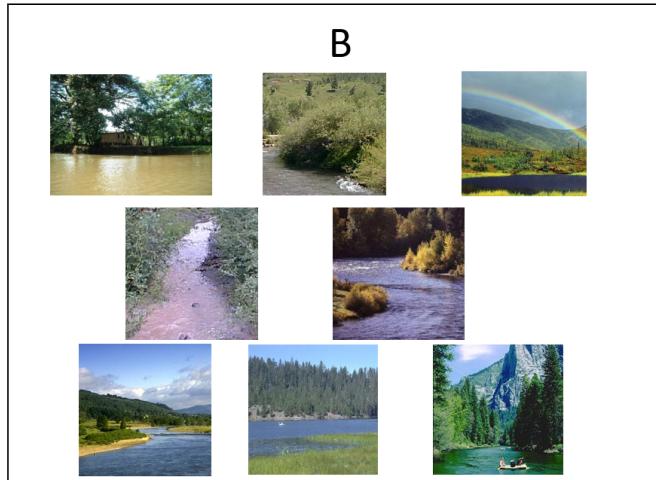
Computer, Dental chair, Dentist, Medicine, Monitor, Office, Television



Which of these better represents what the images in group A have that the images in group B do not?

Ceiling, Chair, Floor, Humanities, Plant, Wall, Window

Television, CD Player, Dental Chair, Set of Instruments, Articulated Lamp, Faucet, Outlet

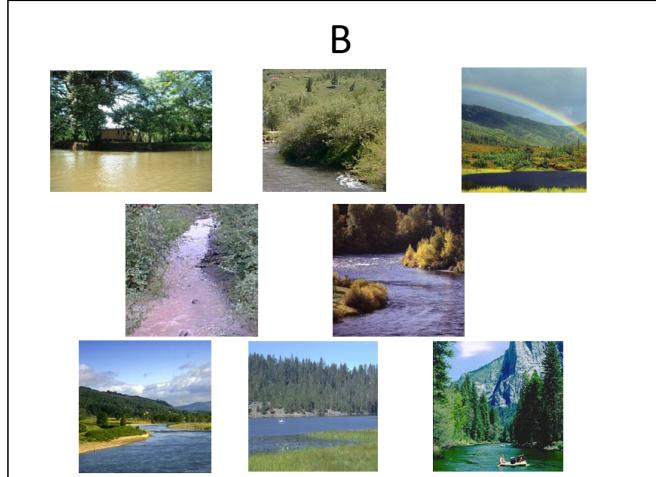


Which of these better represents what the images in group A have that the images in group B do not?

Lighthouse, Navigation, Ocean, Ship, Sky,
Stripe, Tower



Culture, Lighthouse, Materials, Matter,
Objects, Physical objects, Science

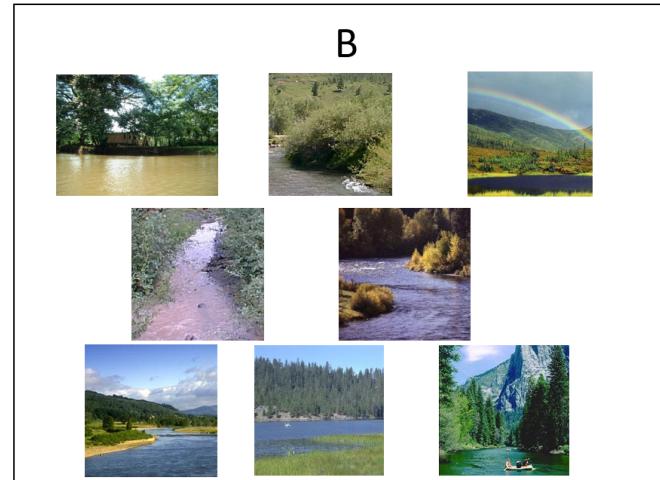


Which of these better represents what the images in group A have that the images in group B do not?

Lighthouse, Beacon, Pharos, Beacon Light,
Wharf, Pier, Dock



Lighthouse, Navigation, Ocean, Ship, Sky,
Stripe, Tower



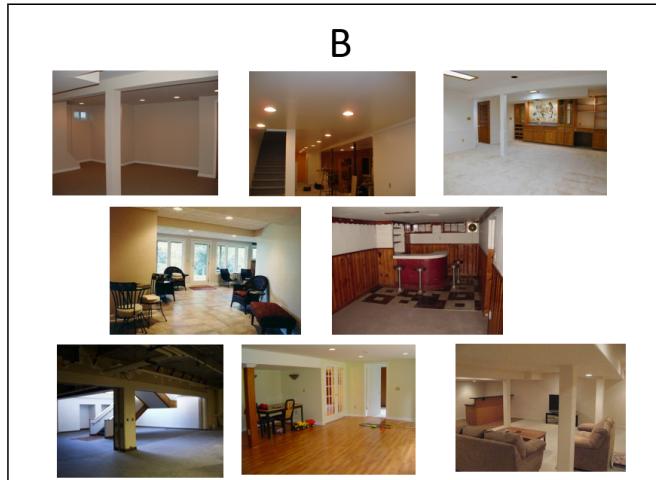
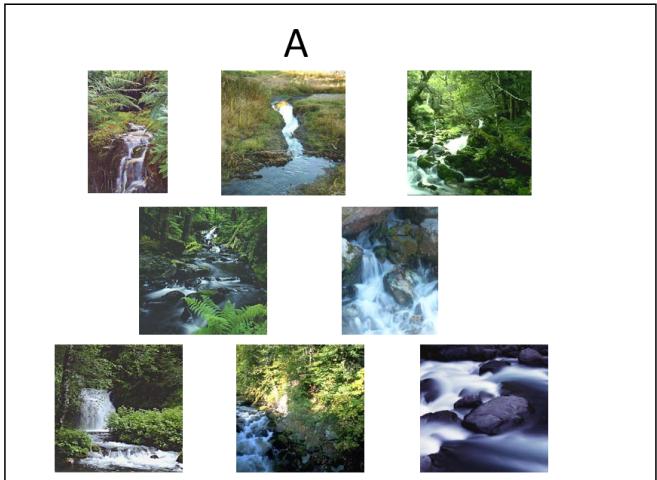
Which of these better represents what the images in group A have that the images in group B do not?

Lighthouse, Beacon, Pharos, Beacon Light,
Wharf, Pier, Dock



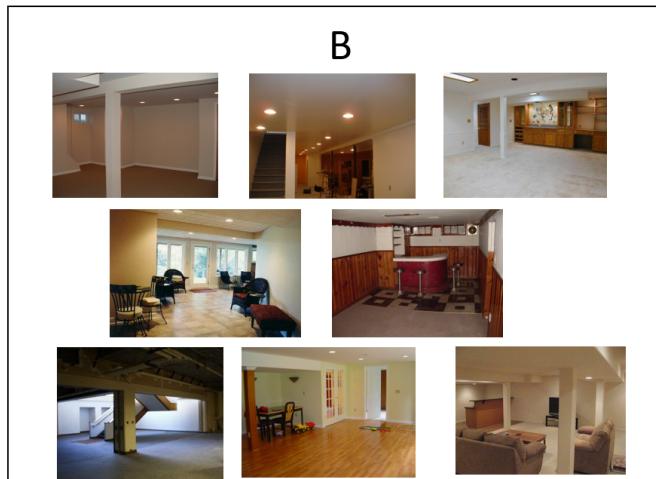
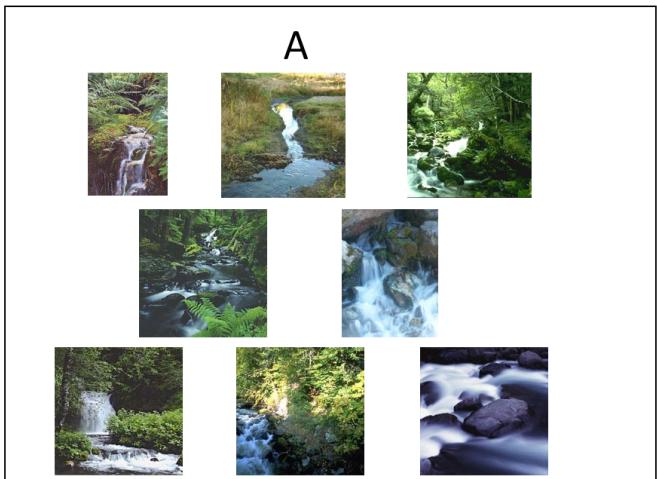
Culture, Lighthouse, Materials, Matter,
Objects, Physical objects, Science





Which of these better represents what the images in group A have that the images in group B do not?

Nature, Outdoor, River, Rock, Stream, Water, Waterfall Matter, Natural materials, Nature, Objects, Science, Stone, Universe



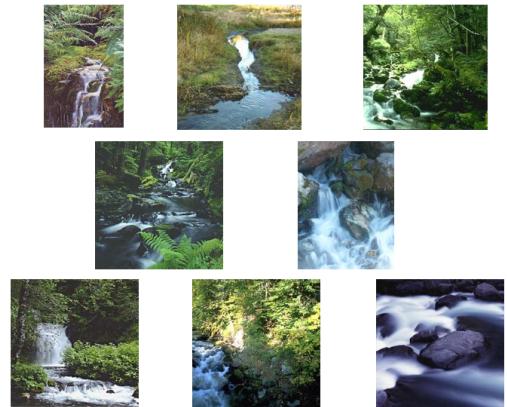
Which of these better represents what the images in group A have that the images in group B do not?

Nature, Outdoors, Landscapes, Wilderness, Nature, Outdoor, River, Rock, Stream, Water, Water bodies, Flora, Geology

Waterfall



A



B

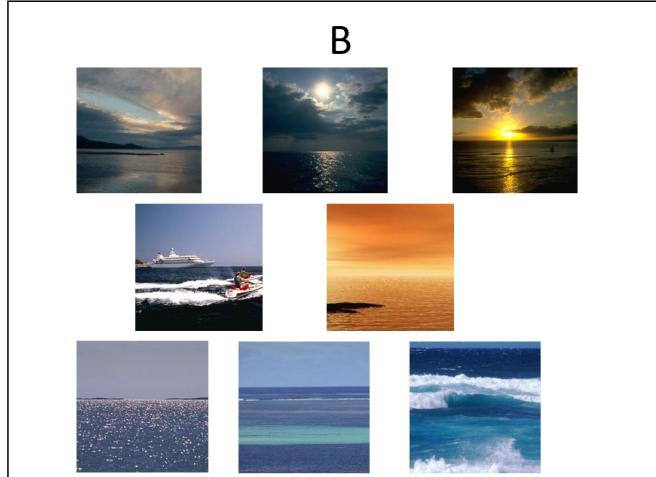
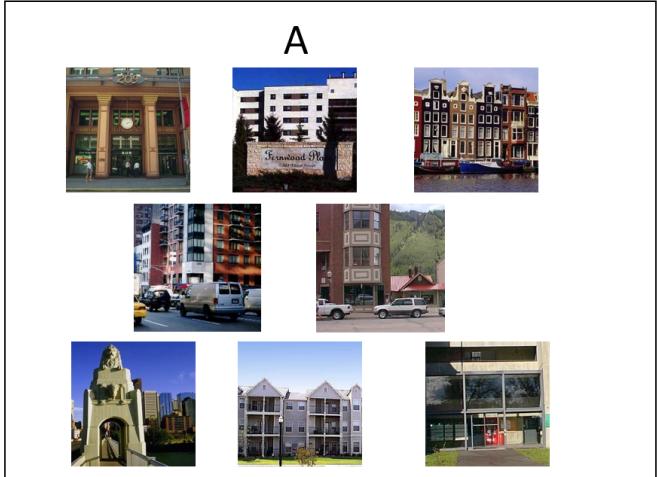


Which of these better represents what the images in group A have that the images in group B do not?

Nature, Outdoors, Landscapes, Wilderness, Water bodies, Flora, Geology

Matter, Natural materials, Nature, Objects, Science, Stone, Universe



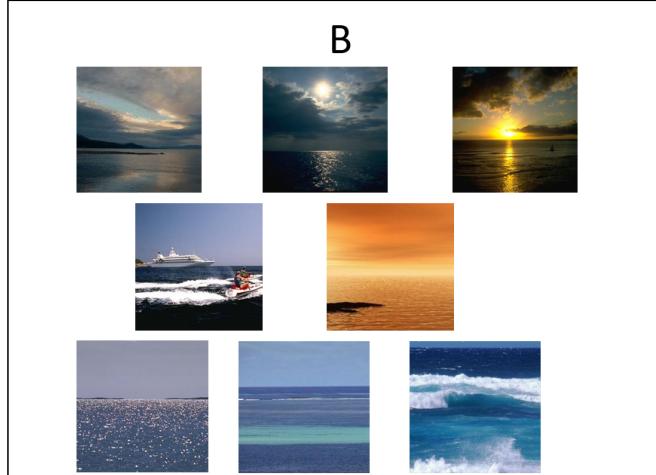
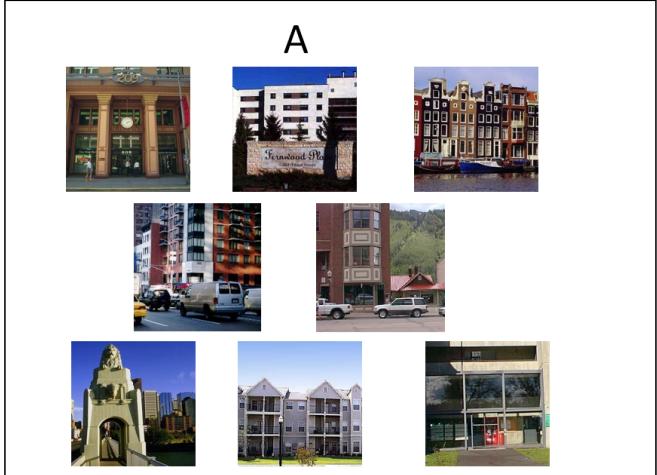


Which of these better represents what the images in group A have that the images in group B do not?

Apartment, Automobile, Building, City,
Doorway, Street, Window



Building, Construction, Culture, Economic
sectors, Economy, Society, Universe

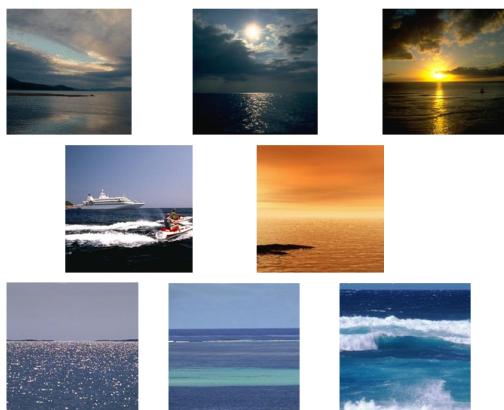


Which of these better represents what the images in group A have that the images in group B do not?

Apartment, Automobile, Building, City,
Doorway, Street, Window



Buildings, Cars/Automobiles, Traffic lights,
Sidewalks/Pavements, Street lights,
Signboards, Trash cans/Waste bins



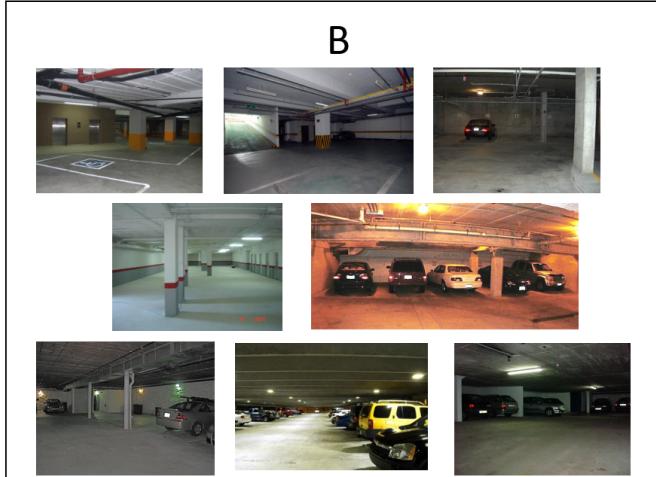
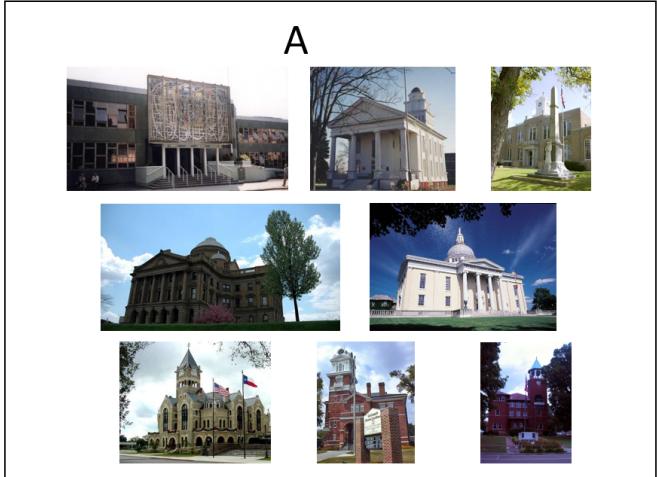
Which of these better represents what the images in group A have that the images in group B do not?

Buildings, Cars/Automobiles, Traffic lights,
Sidewalks/Pavements, Street lights,
Signboards, Trash cans/Waste bins



Building, Construction, Culture, Economic
sectors, Economy, Society, Universe



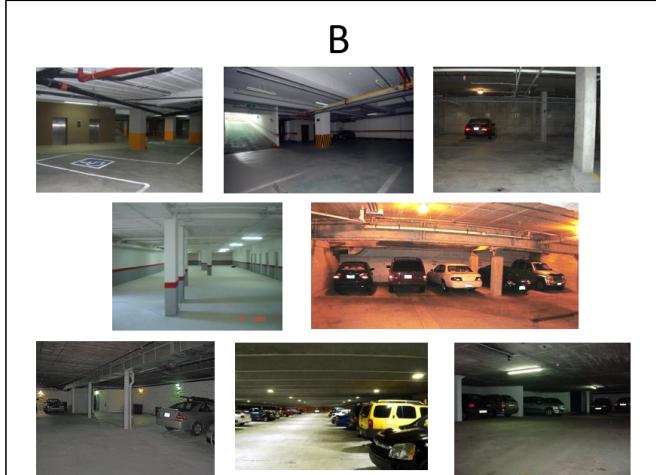
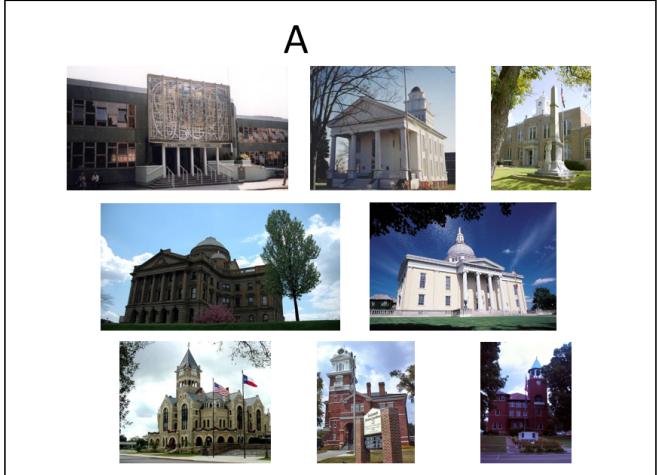


Which of these better represents what the images in group A have that the images in group B do not?

Courthouse, Flag, Flagpole, Outdoor, Tower, Tree, Window

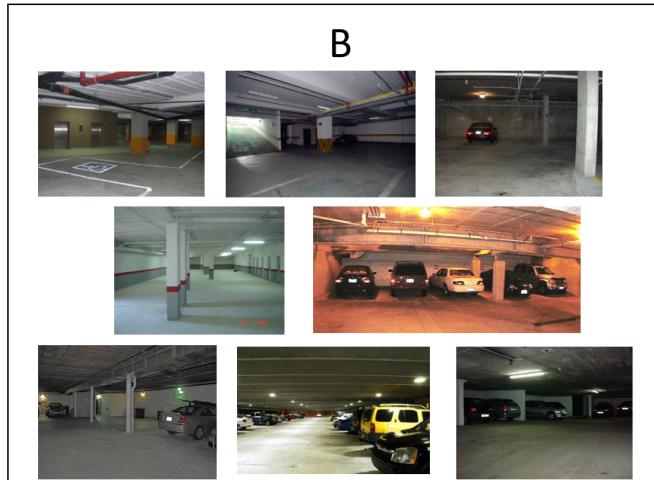
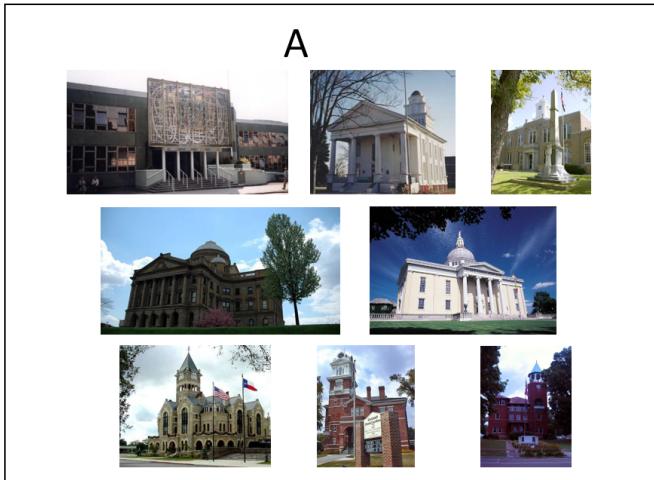


Construction, Culture, Economic sectors, Economy, Nature, Universe, Window



Which of these better represents what the images in group A have that the images in group B do not?

Courthouse, Flag, Flagpole, Outdoor, Tower, Park, Cityscape, Architecture, Urban Scene, Tree, Window Streetscape, Outdoor, Landscaping



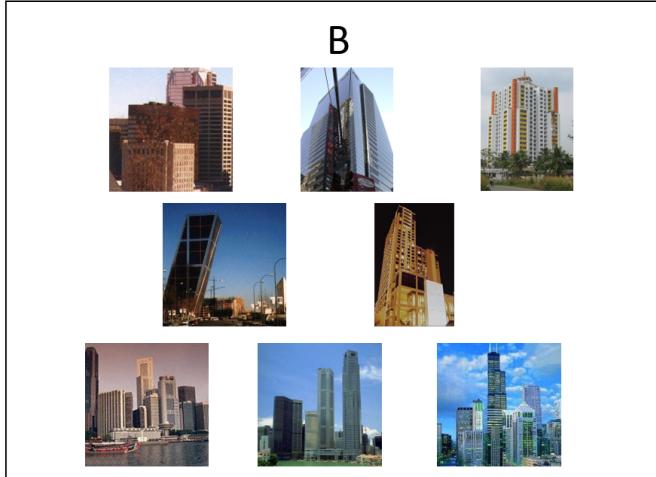
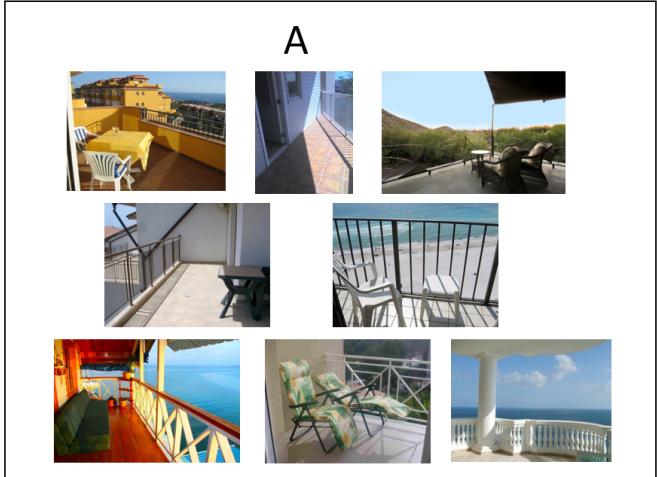
Which of these better represents what the images in group A have that the images in group B do not?

Park, Cityscape, Architecture, Urban Scene, Streetscape, Outdoor, Landscaping



Construction, Culture, Economic sectors, Economy, Nature, Universe, Window



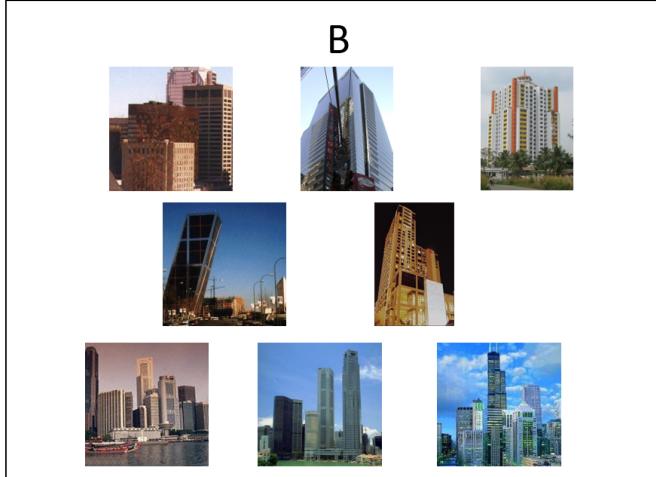
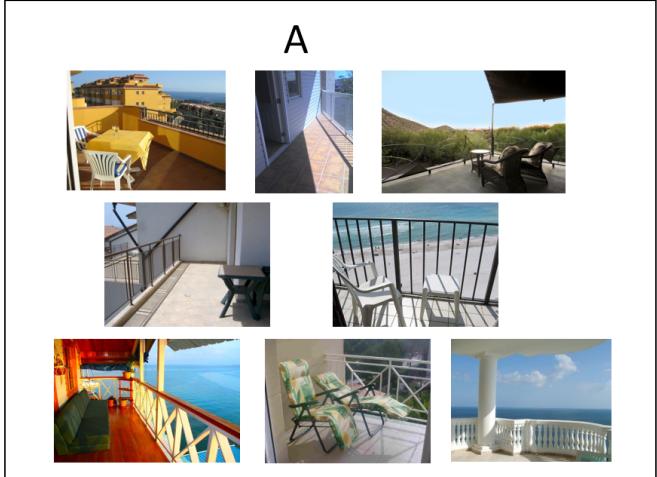


Which of these better represents what the images in group A have that the images in group B do not?

Balcony, Beach, Chair, Deck, Guardrail,
Private, Table



Chair, Door, Floor, Nature, Sky, Universe, Wall

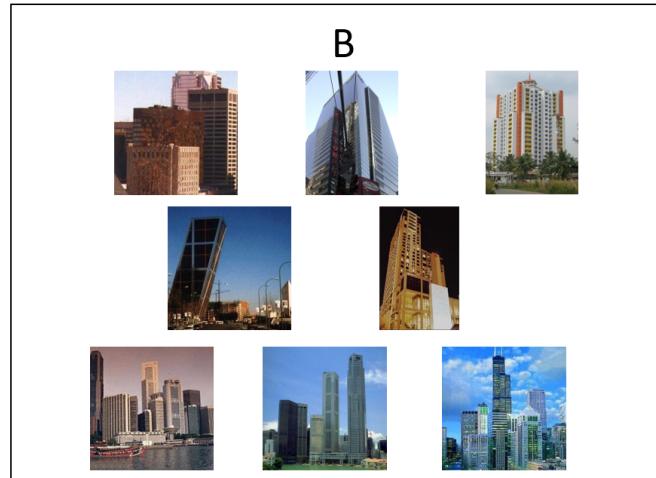
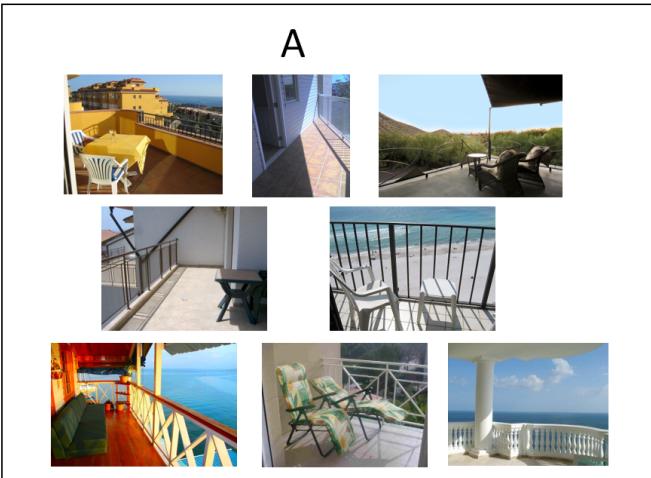


Which of these better represents what the images in group A have that the images in group B do not?

Sofa, Shelf, Pot, Flowerpot, Sea Water,
Railing, Coffee Table



Balcony, Beach, Chair, Deck, Guardrail,
Private, Table



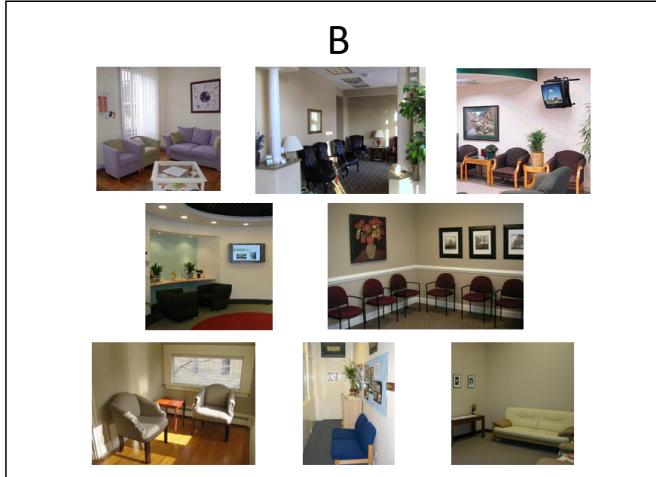
Which of these better represents what the images in group A have that the images in group B do not?

Sofa, Shelf, Pot, Flowerpot, Sea Water,
Railing, Coffee Table



Chair, Door, Floor, Nature, Sky, Universe, Wall



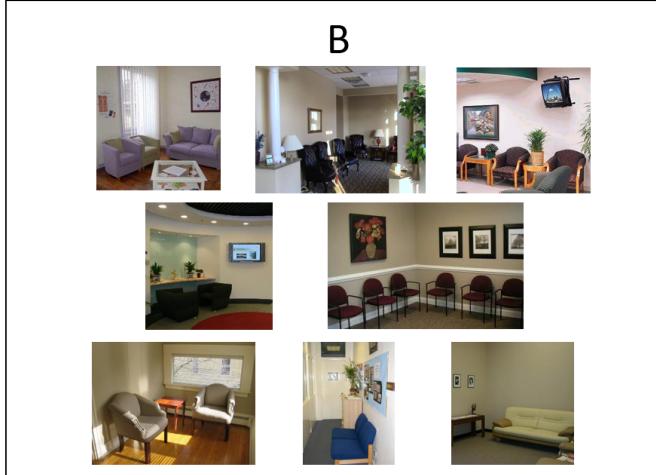


Which of these better represents what the images in group A have that the images in group B do not?

Activity, Game, House, Human, Pool table,
Recreation, Table tennis



Ball games, Billiard table, Ceiling, Floor,
Indoor sports, Sports by type, Wall

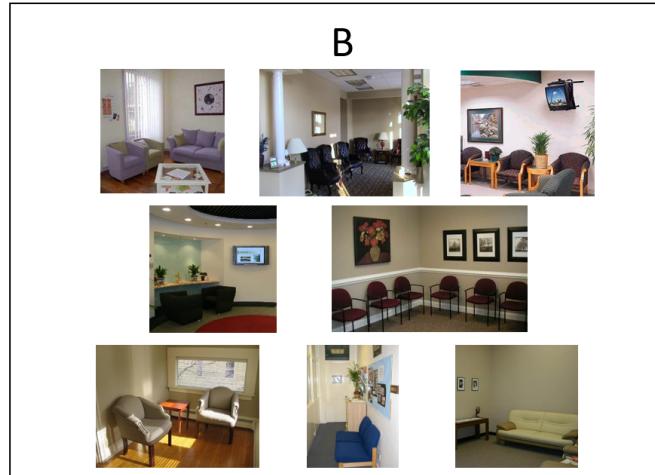


Which of these better represents what the images in group A have that the images in group B do not?

Activity, Game, House, Human, Pool table, Recreation, Table tennis



Billiard Table, Table Football, Arcade Machine, Kitchen Stove, Extractor Hood, Pendant Lamp, Staircase



Which of these better represents what the images in group A have that the images in group B do not?

Billiard Table, Table Football, Arcade Machine, Kitchen Stove, Extractor Hood, Pendant Lamp, Staircase



Ball games, Billiard table, Ceiling, Floor, Indoor sports, Sports by type, Wall





Which of these better represents what the images in group A have that the images in group B do not?

Aircraft carrier, Airplane, Anchor, Nature,
Person, Sky, Universe



Aircraft carrier, Airplane, Boat, Jet, Military,
Ocean, Ship



Which of these better represents what the images in group A have that the images in group B do not?

Aircraft Carrier, Airplane/Aeroplane, Sea Water, Sky, Bags, Standing Person, Runway



Aircraft carrier, Airplane, Boat, Jet, Military, Ocean, Ship



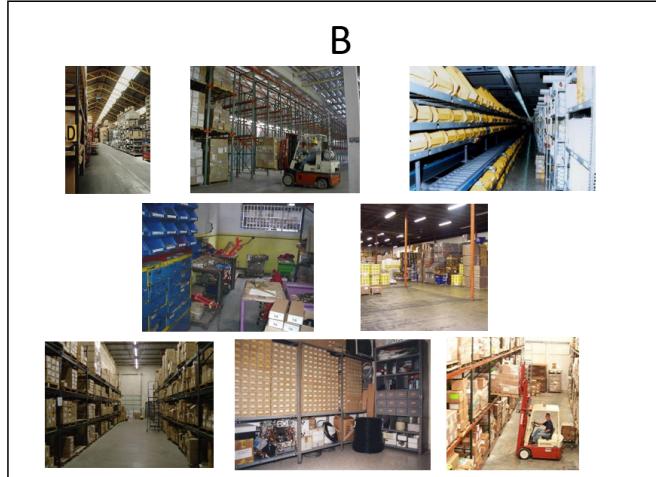
Which of these better represents what the images in group A have that the images in group B do not?

Aircraft carrier, Airplane, Anchor, Nature, Person, Sky, Universe



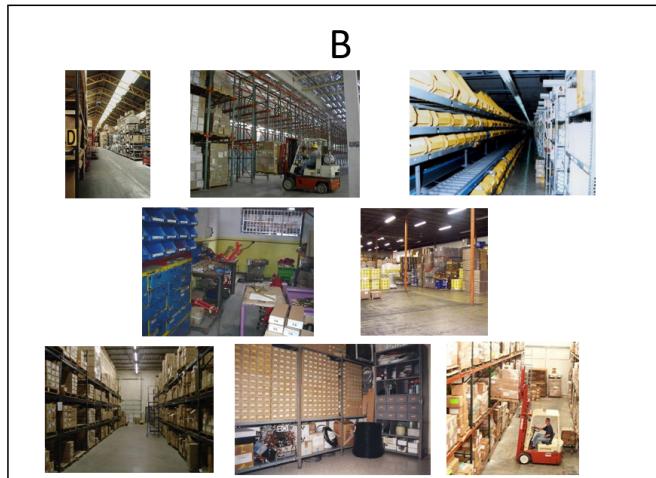
Aircraft Carrier, Airplane/Aeroplane, Sea Water, Sky, Bags, Standing Person, Runway





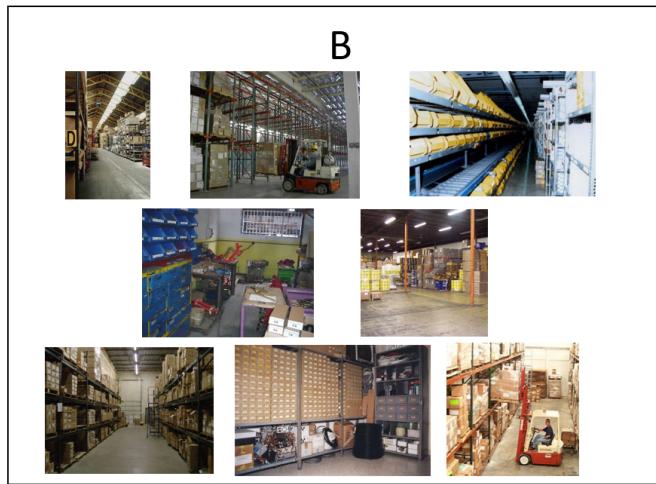
Which of these better represents what the images in group A have that the images in group B do not?

Alcohol, Bar, Chair, Dining, Drink, Pub, Stool Bar, Bottle, Ceiling, Chair, Door, Person, Wall



Which of these better represents what the images in group A have that the images in group B do not?

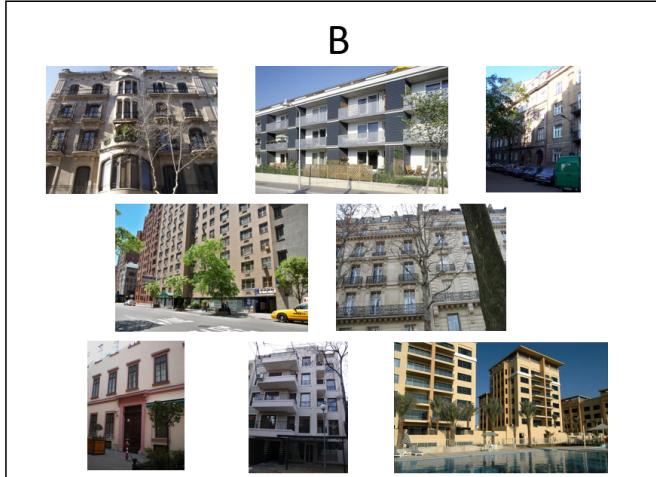
Alcohol, Bar, Chair, Dining, Drink, Pub, Stool Bar, Beer Machine, Billiard Table, Chandelier,
Fire Extinguisher, Pendant Lamp,
Refrigerator



Which of these better represents what the images in group A have that the images in group B do not?

Bar, Beer Machine, Billiard Table, Chandelier, Bar, Bottle, Ceiling, Chair, Door, Person, Wall
Fire Extinguisher, Pendant Lamp,
Refrigerator





Which of these better represents what the images in group A have that the images in group B do not?

Bake, Bakery, Bread, Indoor, Product, Store, Basket, Bread, Cake, Ceiling, Floor, Person, Woman



Which of these better represents what the images in group A have that the images in group B do not?

Bakery Shop, Pastry Display, Bread Shelf, Indoor Scene, Cake Counter, Bread Basket, Food Showcase



Bake, Bakery, Bread, Indoor, Product, Store, Woman



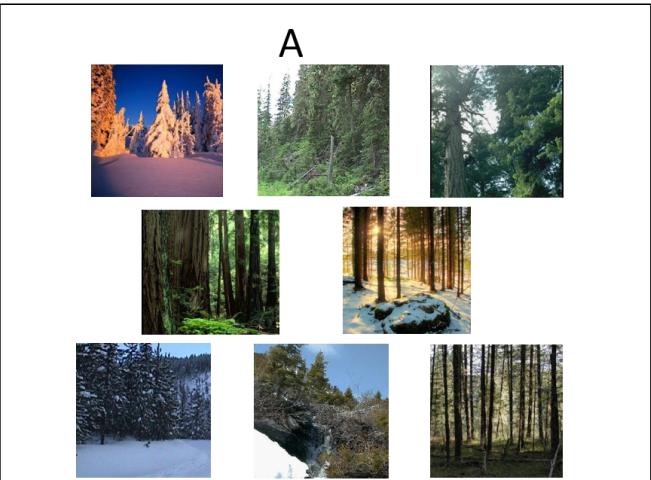
Which of these better represents what the images in group A have that the images in group B do not?

Bakery Shop, Pastry Display, Bread Shelf, Indoor Scene, Cake Counter, Bread Basket, Food Showcase



Basket, Bread, Cake, Ceiling, Floor, Person, Wall



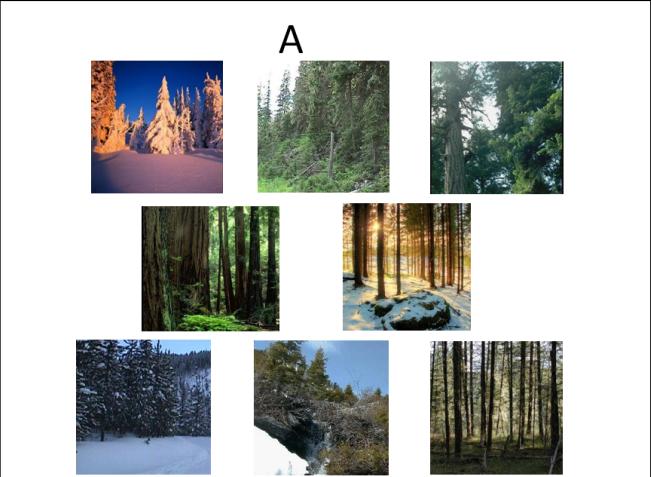


Which of these better represents what the images in group A have that the images in group B do not?

Branch, Forest, Nature, Outdoor, Sky, Snow, Tree



Forms of water, Nature, Phases of matter, Sky, Tree, Universe, Winter phenomena

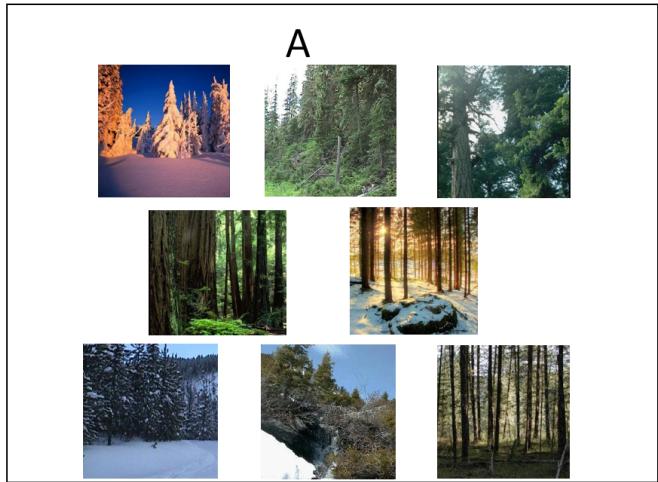


Which of these better represents what the images in group A have that the images in group B do not?

Flora, Trunk, Shrub, Bush, Rock, Earth, Snow Branch, Forest, Nature, Outdoor, Sky, Snow, Tree



Tree



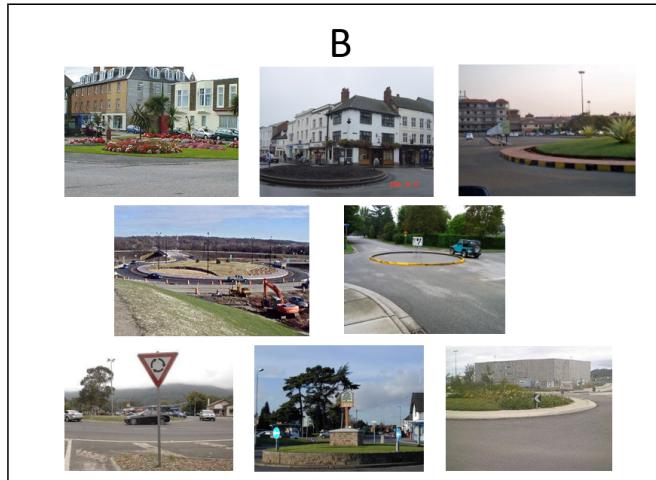
Which of these better represents what the images in group A have that the images in group B do not?

Flora, Trunk, Shrub, Bush, Rock, Earth, Snow



Forms of water, Nature, Phases of matter, Sky, Tree, Universe, Winter phenomena



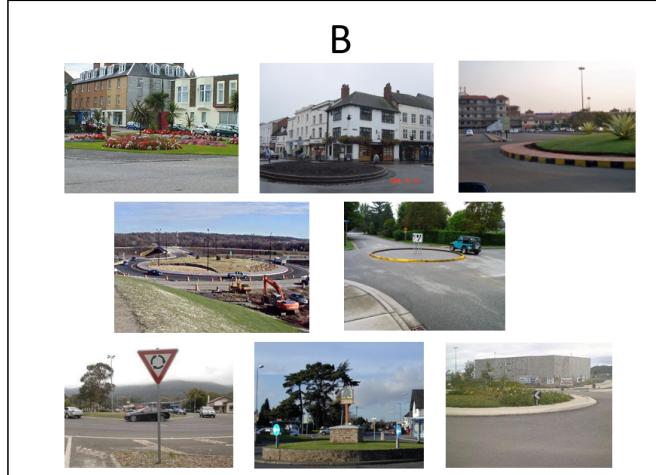


Which of these better represents what the images in group A have that the images in group B do not?

Bay window, Brick, House, Nook, Window, Windowpane, Yard



Building, Construction, Culture, Economic sectors, Economy, Plant, Window



Which of these better represents what the images in group A have that the images in group B do not?

Bay window, Brick, House, Nook, Window,
Windowpane, Yard



Flowerpot, Pane of Glass, Sash, Planter,
Muntin, Stile, Flush Mount Light



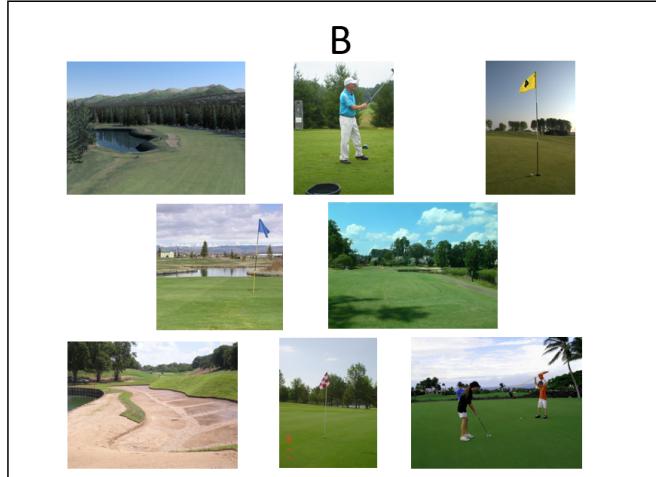
Which of these better represents what the images in group A have that the images in group B do not?

Building, Construction, Culture, Economic
sectors, Economy, Plant, Window



Flowerpot, Pane of Glass, Sash, Planter,
Muntin, Stile, Flush Mount Light



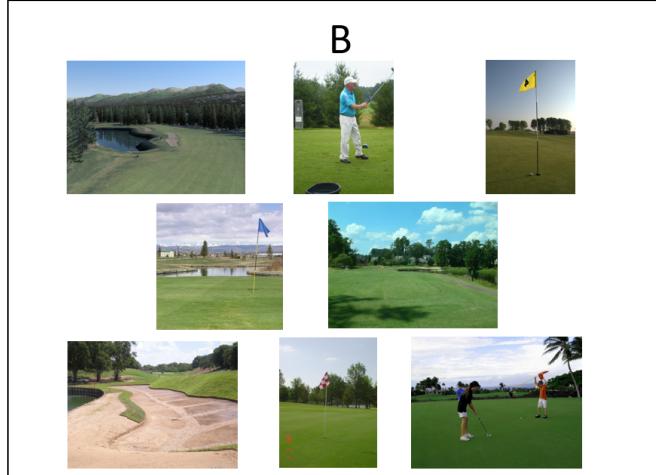


Which of these better represents what the images in group A have that the images in group B do not?

Business, Desk, Floor, Indoor, Paper,
Reception, University



Art materials, Ceiling, Door, Floor, Person,
Wall, Writing

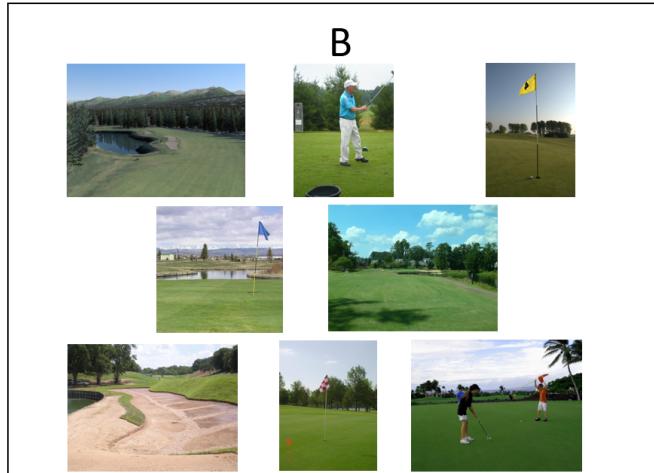
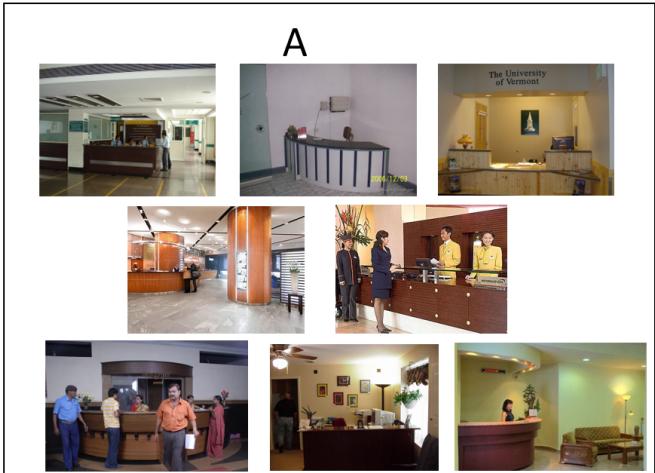


Which of these better represents what the images in group A have that the images in group B do not?

Business, Desk, Floor, Indoor, Paper,
Reception, University



Interior Design, Furniture, Home Decor,
Indoor Plants, Lighting Fixtures, Household
Items, Office Equipment



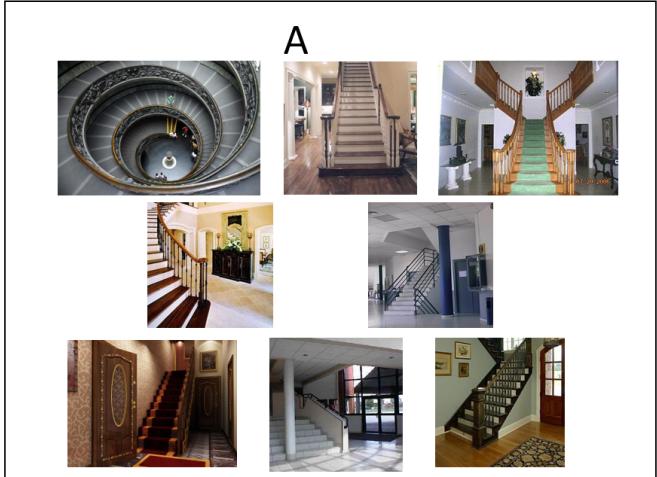
Which of these better represents what the images in group A have that the images in group B do not?

Art materials, Ceiling, Door, Floor, Person,
Wall, Writing



Interior Design, Furniture, Home Decor,
Indoor Plants, Lighting Fixtures, Household
Items, Office Equipment



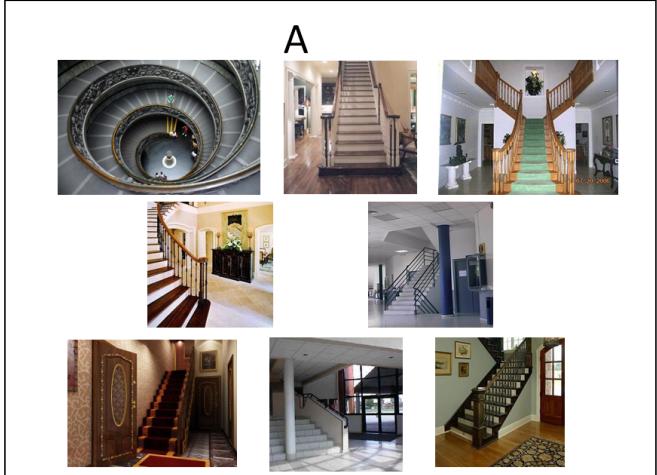


Which of these better represents what the images in group A have that the images in group B do not?

Carpet, Floor, Hallway, Handrail, Indoor, Staircase, Stairs



Ceiling, Chair, Column, Door, Floor, Staircase, Wall

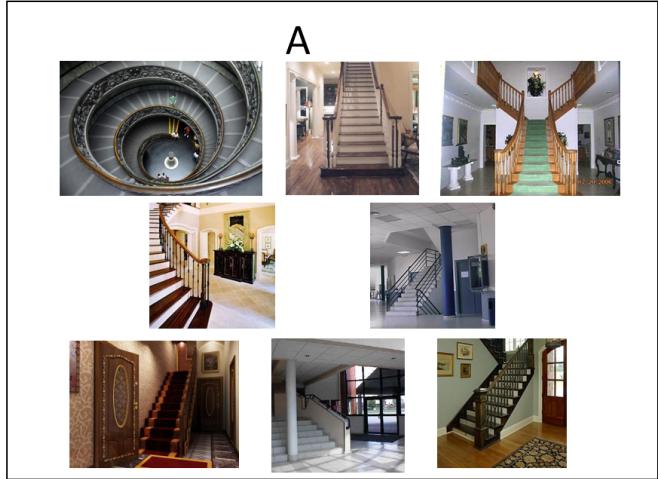


Which of these better represents what the images in group A have that the images in group B do not?

Carpet, Floor, Hallway, Handrail, Indoor, Staircase, Stairs



Interior Decor, Furniture, Staircase, Home Lighting, Floor and Flooring, Wall Decorations, Indoor Plants



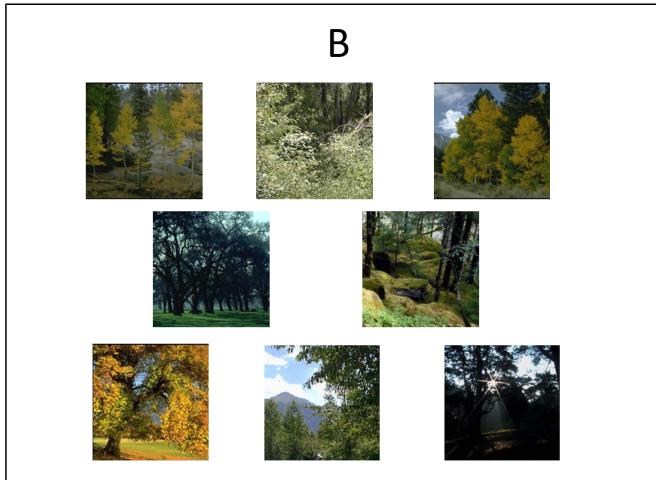
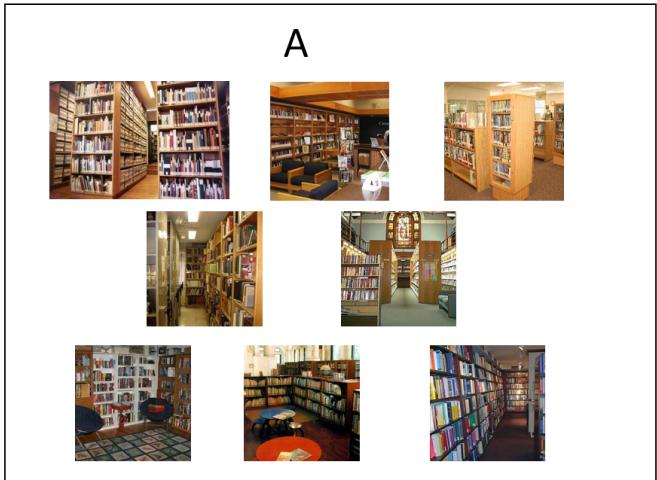
Which of these better represents what the images in group A have that the images in group B do not?

Interior Decor, Furniture, Staircase, Home Lighting, Floor and Flooring, Wall Decorations, Indoor Plants



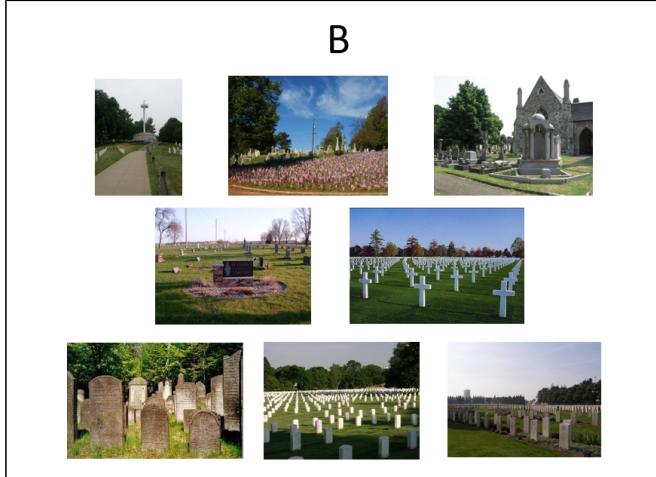
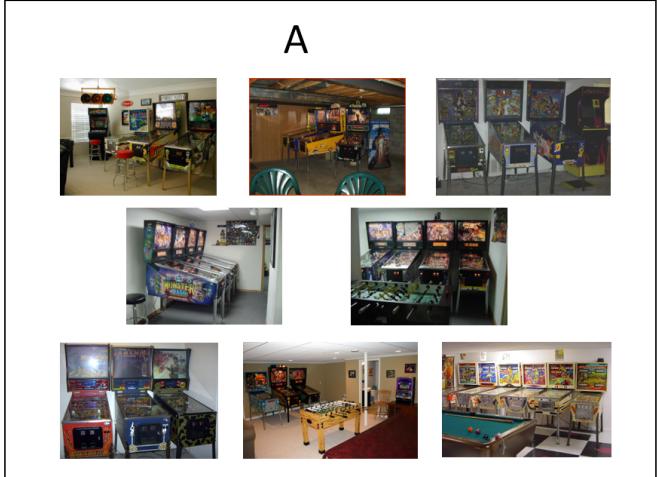
Ceiling, Chair, Column, Door, Floor, Staircase, Wall





Which of these better represents what the images in group A have that the images in group B do not?

Book, Bookcase, Floor, Indoor, Library, Shelf, Bird, Engine, Honey, Midnight, Piano, Pizza, Table

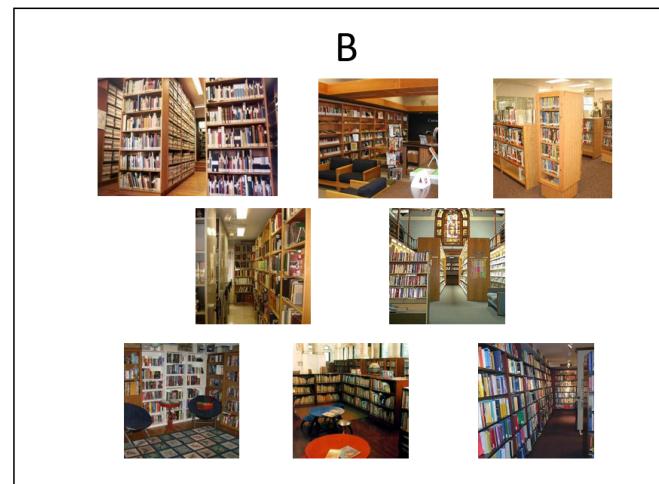
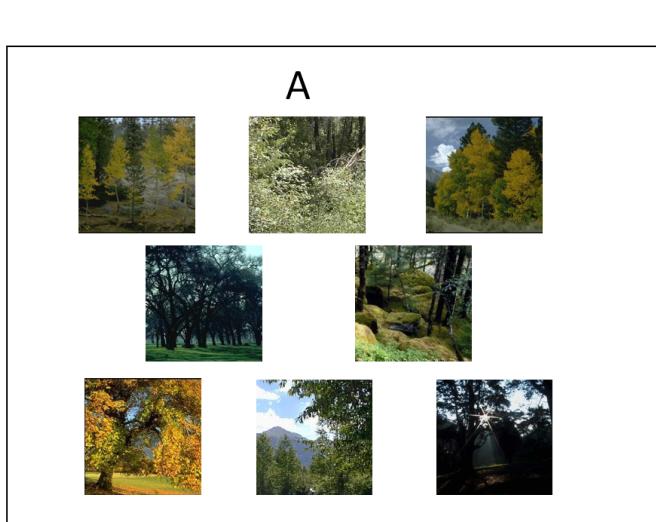


Which of these better represents what the images in group A have that the images in group B do not?

Gate, Heart, Politics, Salad, Throat,
University, Writer



Arcade, Entertainment, Floor, Game, Indoor,
Pinball, Wall



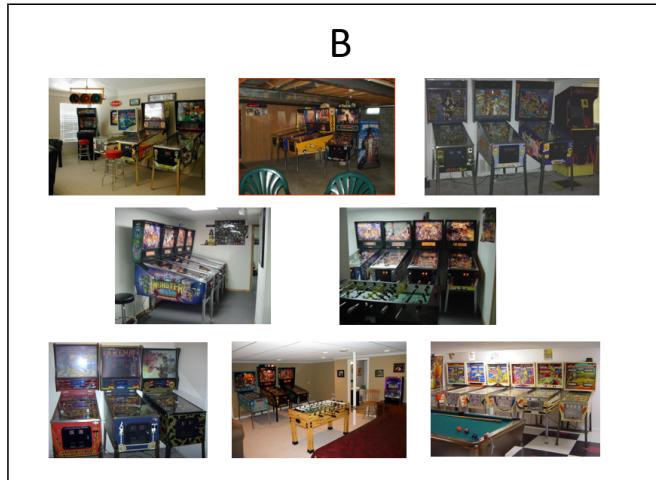
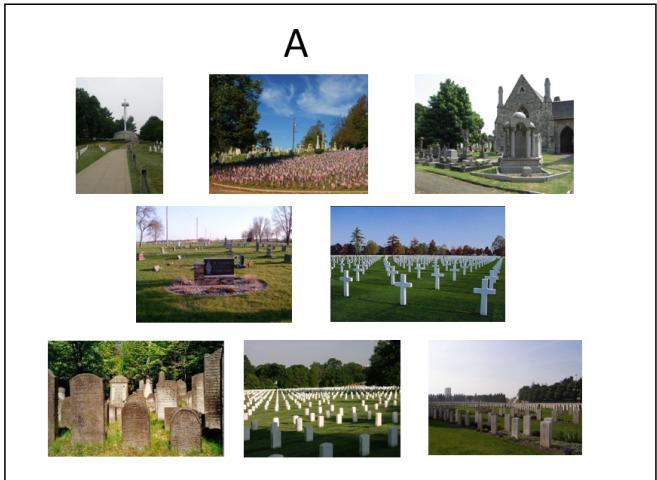
Which of these better represents what the images in group A have that the images in group B do not?

Forest, Grass, Leaf, Plant, Sky, Tree,
Vegetation



Bath, Cookie, Guitar, News, Pizza,
Transportation, Woman



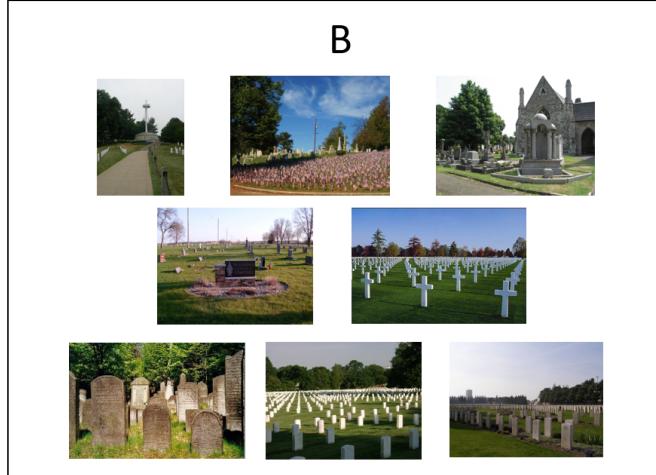


Which of these better represents what the images in group A have that the images in group B do not?

Baseball, Customer, Education, Fish, Hall,
Pollution, Vehicle



Cemetery, Cross, Field, Grass, Grave,
Sidewalk, Sky



Which of these better represents what the images in group A have that the images in group B do not?

Cabinet, Chair, Floor, Light fixture, Table, Wall, Window Actor, Depression, Drawing, Elevator, Farmer, Hospital, Uncle



Survey

Please answer the following questions about your overall experience on this task.
Please provide answers that reflect your experience on average across all the trials.

How easy to understand were the instructions for this task?

Very easy - 1 2 3 4 5 - Very difficult



How well do you think you understand what you were supposed to do in this task?

Not at all - 1 2 3 4 5 - Very well



How hard was it to tell if one explanation was better than the other for a trial?

Very easy - 1 2 3 4 5 - Very difficult



How much time did it take you to decide which explanation was better on a trial?

Very little time - 1 2 3 4 5 - A long time

How enjoyable was this task?



If you had to come up with explanations of your own for what made group A different from group B, how difficult do you think this would have been? Assume you needed to list 5-7 concepts in your explanation.



On a continuum from 'individualized' to 'holistic,' how would you characterize your strategy for deciding which list of concepts was better?



Please describe the strategy you used in more detail.

Were any of the trials particularly difficult or particularly easy? If so, which ones?

Did you start to get tired of this task the more trials you completed?

About how many more trials do you think you could do before you started to lose attention and could not accurately continue? Assume appropriate pay to the length of the work.

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