Santa Claus's Workshop

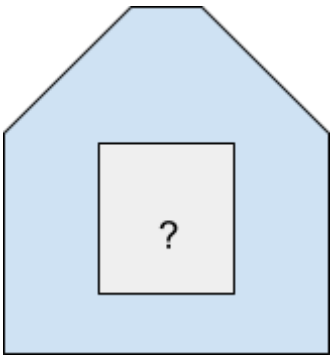
Main Idea of the Game :

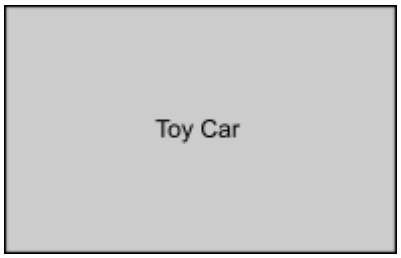
Santa's workshop is the legendary workshop where Santa and his elves are said to make the toys and presents given out at Christmas. It is the 24th of December and Santa is not feeling well. Santa's magic, which is said to do most of the work around in the workshop, is not as effective now and the production of toys and gifts have been affected. The machines are malfunctioning and the elves are totally disoriented. Santa seeks help from the player, who using his/her computational thinking skills, makes sure that the gifts are delivered to the children around the globe on time on Christmas eve.
The scene is set on the North pole inside Santa's Workshop.

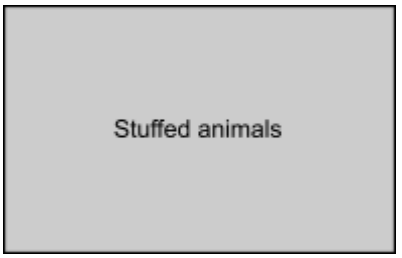
Pattern Recognition :

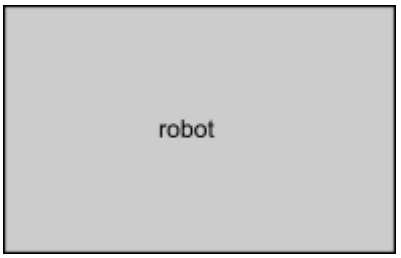
Each subpart will have three levels each of Easy, Medium and Hard category.

- **Group Pattern :**
  The gifts are assorted into groups of different categories : **color of wrapping, type of toys, distribution to continent etc.**
  There are boxes of different categories present in the scene with a moving outlet at the top from which toys drop.



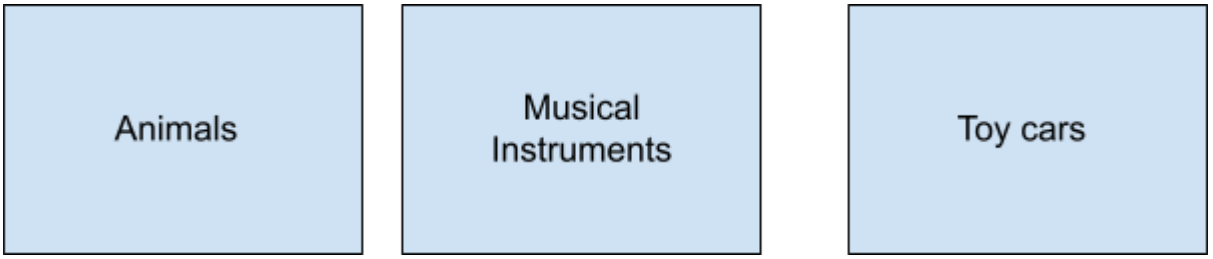






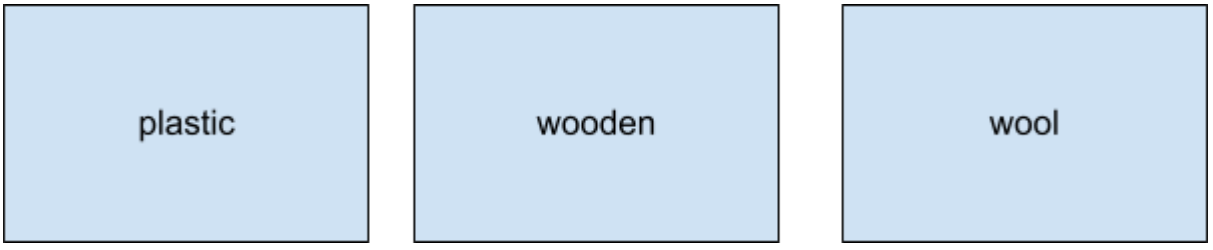
The picture of a toy which the outlet ejects out will be shown briefly in the white empty space in place of the **?** mark. The outlet aligns itself automatically over the box and drops the toy on the pile. However, due to some malfunction in the system, the outlet sometimes misaligns itself and drops the toy on a different pile. The player has to report this by pressing the halt button, i.e whenever the toy does not satisfy the grouping pattern. An elf will come and put the toy in the correct box.
There will be 3 levels where each level will have group pattern categories as follows. The speed of falling toys will increase with each level making it EASY, MEDIUM & HARD.

Easy :

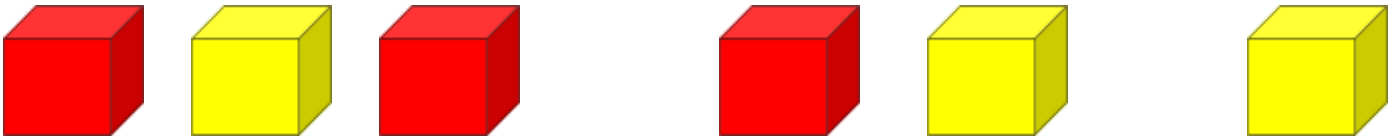


Medium :

Hard :



Missing Pattern :
A machine producing gifts in a particular sequence has produced a set of gifts which are now set on the table. But an elf has misplaced some boxes. Help the elves find the missing gifts to complete the patterns.

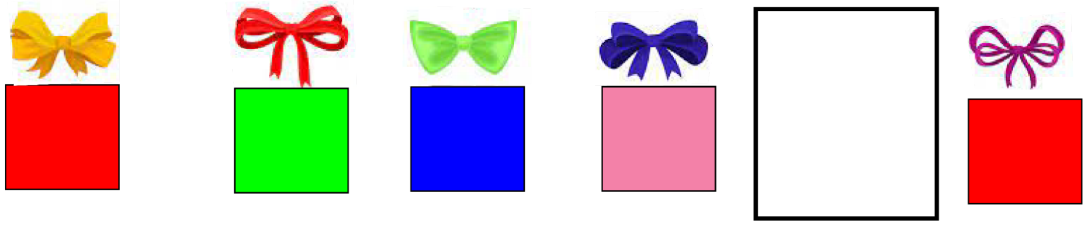


The levels are as follows :

Easy :

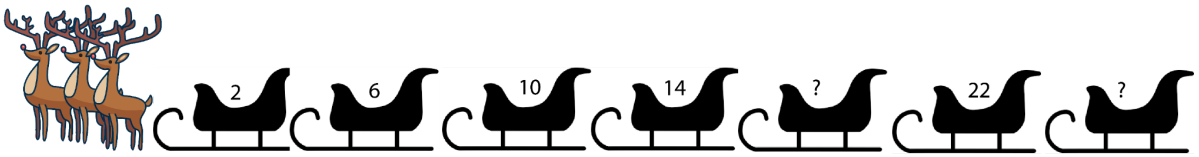
Medium :

Hard :



Sequential Pattern :

Seven sleighs are attached to reindeers where the **number** of gifts form a pattern. The 7 sleighs are designated to the seven continents where the gifts are taken. Once the player has decided on the number of gifts, the sleigh will fill with that number.



Easy :

1 , 11 , 21 , 31 , __ , 51 , __

2 , 3 , 5 , 7 , __ , 13 , 17

__ , 20 , __ , 22 , 23 , 24 , __

6 , 11 , 16 , 21 , __ , 31 , __

Medium :

120 , 115 , 105 , 90 , __ , 45 , __

2 , 3 , 5 , 8 , 13 , __ , __

1 , 2 , 6 , 24 , 120 , 720 , __

Hard :

8 , 27 , 64 , 125 , __ , 343 , __ {x^3}

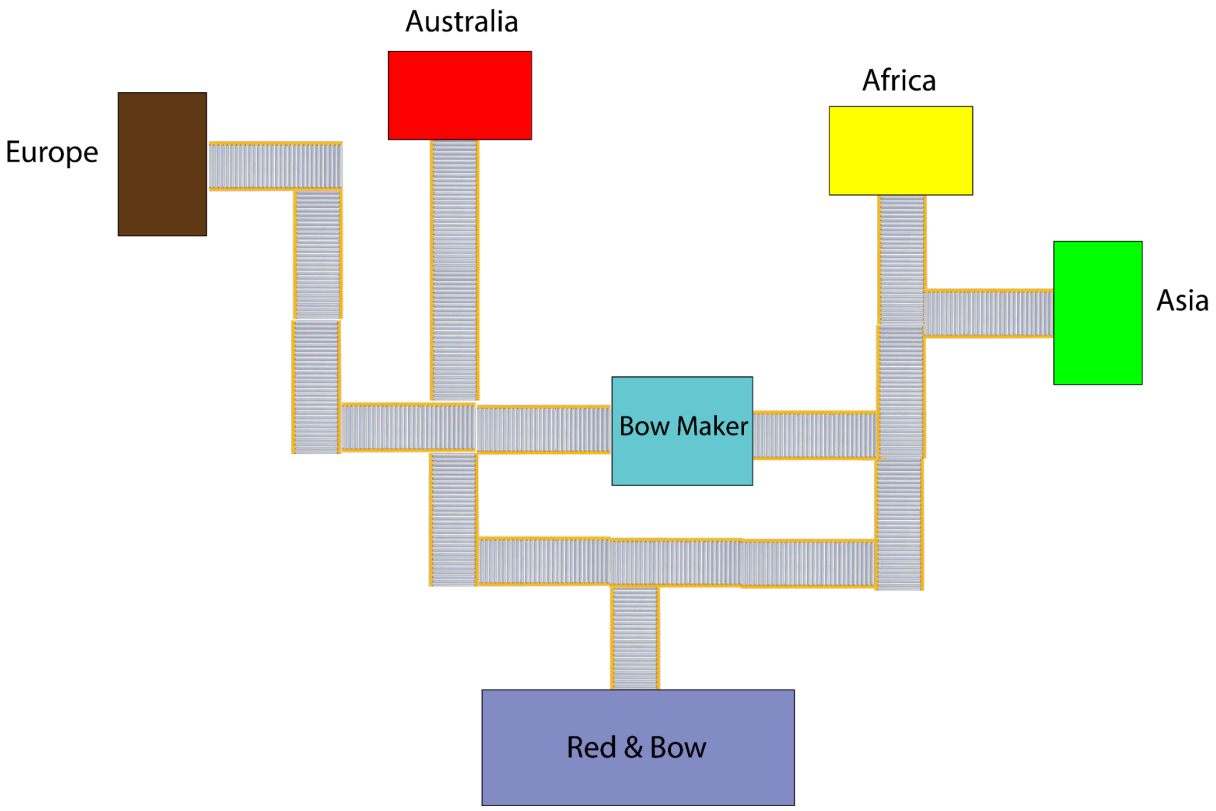
2 , 5 , 10 , 17 , 26 , __ , __ {x^2+1}

1 , 10 , 11 , 100 , 101 , __ , 111 {binary}

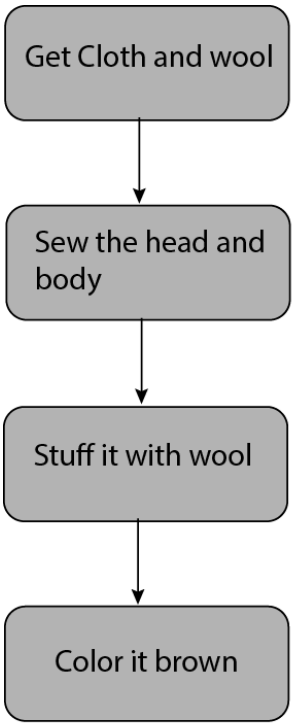
Algorithmic Thinking :

There are two categories to this game :

- The gifts (with different wrapping color) will emerge from the machine on a moving conveyor belt. This is something similar to the game in : (https://youtu.be/SRsVQoe_zT0 at timestamp 5:00).
  Here there will be larger cartons where the gifts are to be stored based on the continent of transport. The goal is to feed instructions in the form of ← and → arrow keys to the machine beforehand, which the belt follows to take the gift to the correct carton.
  It is also possible that a gift has a bow attached to it or it is not. Based on this, the gift needs to be guided to the bow making section of the ramp as under :



- The second category involves the player to fill in empty spaces in a flowchart to command the machine to generate gifts automatically. The player has to pick out instructions from a list to fill the algorithm.
  There will be levels each exploiting the if/else condition and loop mechanisms. For example if a given gift needs to be generated say 5 times, then the player will attach the loop to the chart to repeat the steps.



Add wheels to it

cut the wood in square shape

cut a plastic cube for the body

Color it Red

Abstraction :

1) Santa is unwell and he has not reviewed his “Naughty and Nice“ list yet. The player has to go through the list to read the profiles of different children and judge them as naughty or nice based on the information provided about them.
They have to pick out the most relevant detail which attributes the child as “Naughty or Nice” out of a given list of other irrelevant and unnecessary details. For example :

****

Name : Philbert
Age : 9

- Favorite song - “You got a friend in me”.
- Likes to play chess
- Eats his vegetables
- Visits the zoo every Sunday

****

Name : Alex
Age : 8

- Keeps his room dirty
- Rides his bike to school
- Likes to play football with his friends
- Has a pet dog named Tommy

****

Name : Sarah
Age : 10

- Favorite fruit is Mango
- Shares her doll with her little sister
- Likes to read the classics
- Visits the water park quite often.

****

Name : Jim
Age : 12

- Knows how to speak Spanish
- Is a good singer
- Forgets to complete his homework
- Favorite movie - “The Lion King”.

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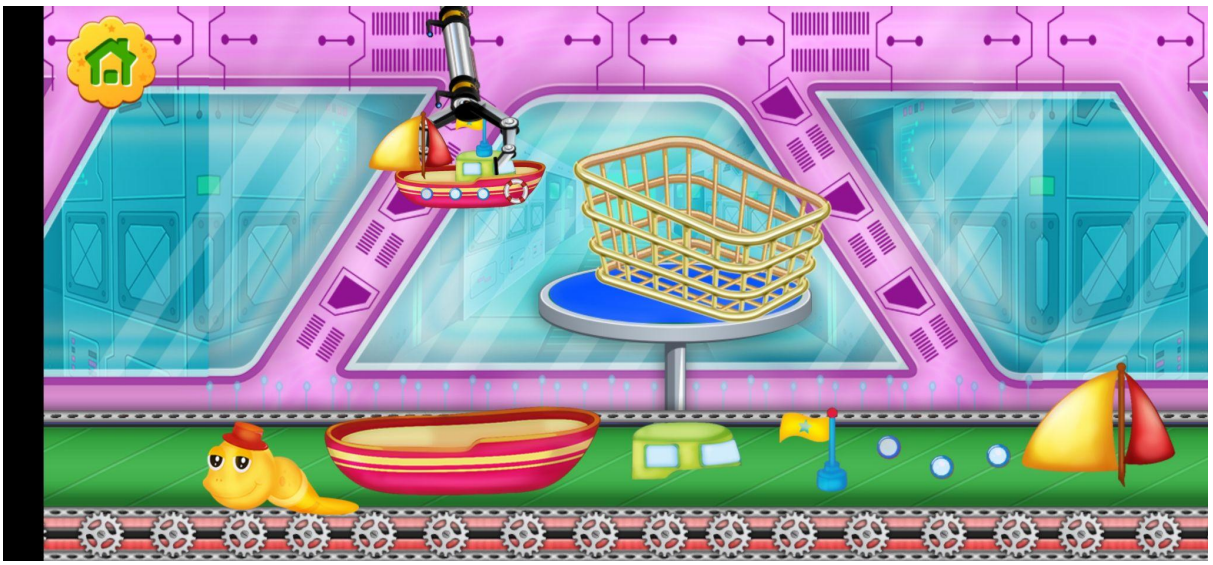
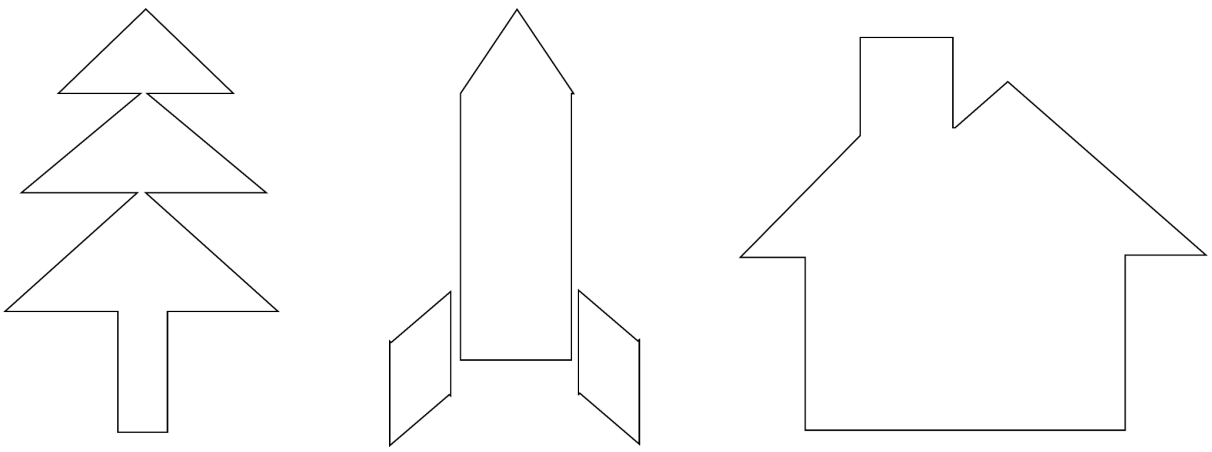
2) A set of toy parts will move on a conveyor belt on the screen. The player has to pick only those parts which are required in the making of the toy shown at the top.



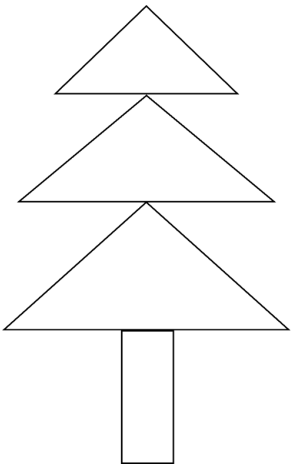
Decomposition :

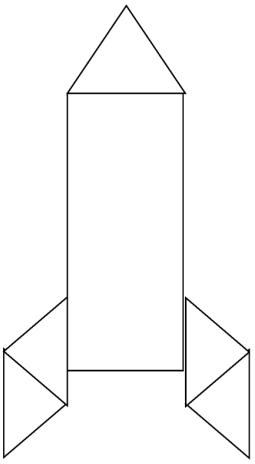
The dwarves are almost ready with their gifts and they have successfully saved christmas. With no more work left, it's time to celebrate. But they cannot do so on an empty stomach. The player has to help the baker to bake Christmas cookies for everyone. However, there is not enough flour and the baker must make sure he mixes just enough batter to make the cookies without wasting any.
The player will be presented with the shape of the cookie. From this shape, he or she has to determine the exact amount of flour required, which is directly proportional to the area of the shape. The player needs to break down the complex shape into simplified parts whose area can easily be calculated. Summation of the individual areas will give the total area, and hence, the amount of flour required to make the cookie.

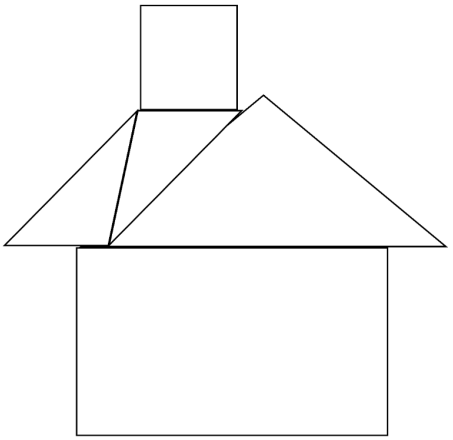
The shapes of cookies are given below in increasing order of difficulty :



The shapes should be divided in the following manner and the area of individual parts is calculated :







Calculation :

1) The area can be calculated in standard manner by providing the dimensions of various edges in the shape. The player can then divide the shape into standard shapes like rectangle, square and triangle and use the dimensions to find out the area.
2) A set of basic geometric shapes will be shown at the bottom of the screen. These geometric shapes will carry certain values, which is the measure of their area already calculated. There will be a '+' and '-' sign which increases and decreases the size of the selected geometric shape. The player has to adjust the size of the shape till it perfectly fits the vacant space in the cookie structure. The player then adds all the values on the shapes (the area) which gives the total area of the structure.