

# DSA sketch:

## Data Structures and Algorithms Drawing Game

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Visualizations are often used to teach abstract concepts like algorithms and data structures. DSAsketch is a game that can be used to practice a wide range of concepts related to data structures and algorithms. During the game, the players are viewing, constructing and presenting their own visualizations. Thus, they are required to engage with the visualizations in many different ways.

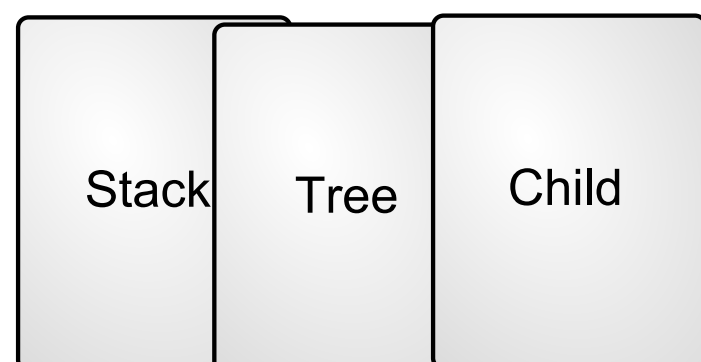
### Rules

#### Materials

Stack of cards with DSA related concepts in three categories.

##### Easy

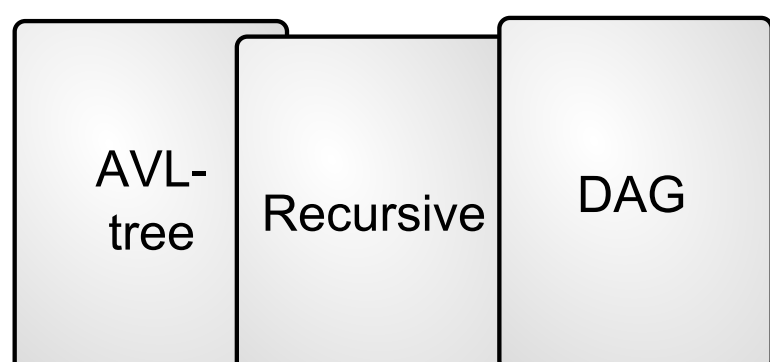
- Worth 1 point
- Drawing time: 1min



Words that have meaning in the course context but also outside the course scope.

##### Medium

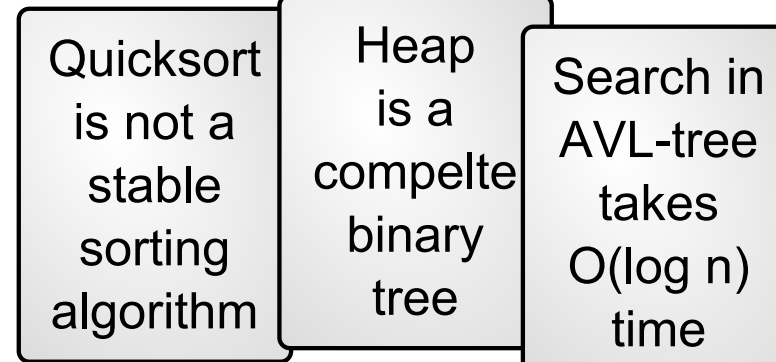
- Worth 3 points
- Drawing time: 2min



Course concepts.

##### Hard

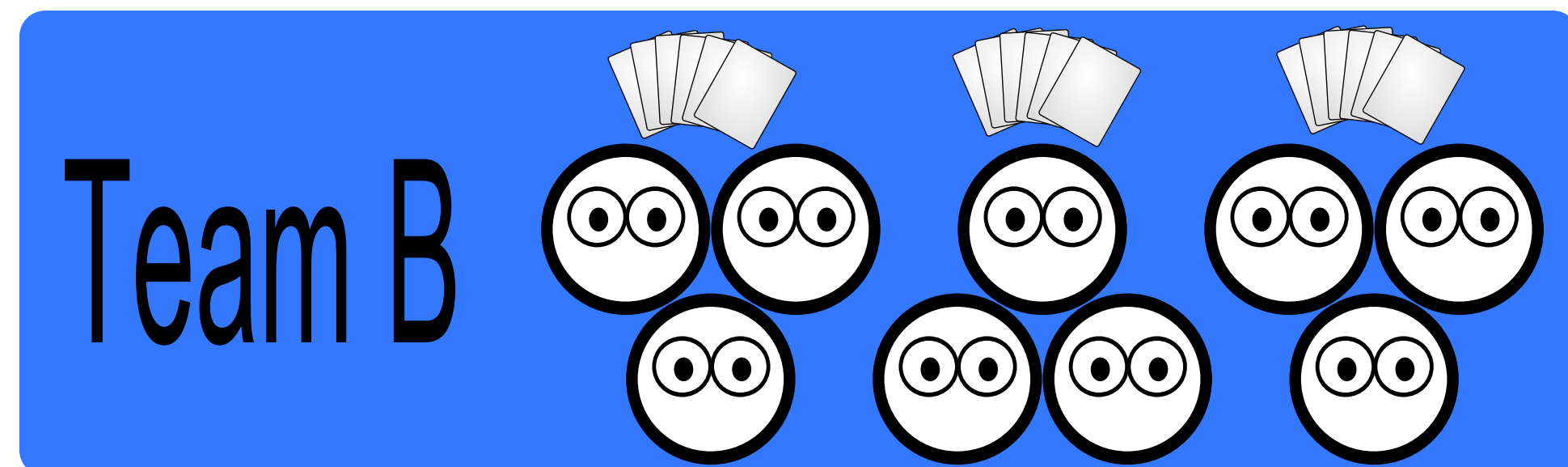
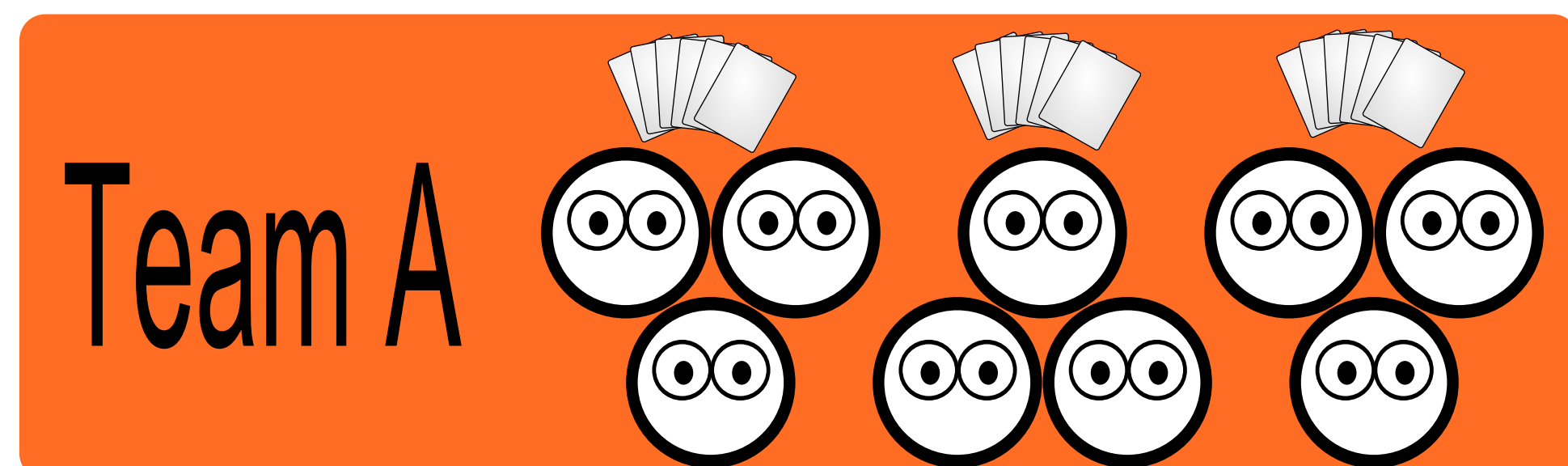
- Worth 5 points
- Drawing time: 3min



Sentences/clauses related to course topics.

#### Preparations

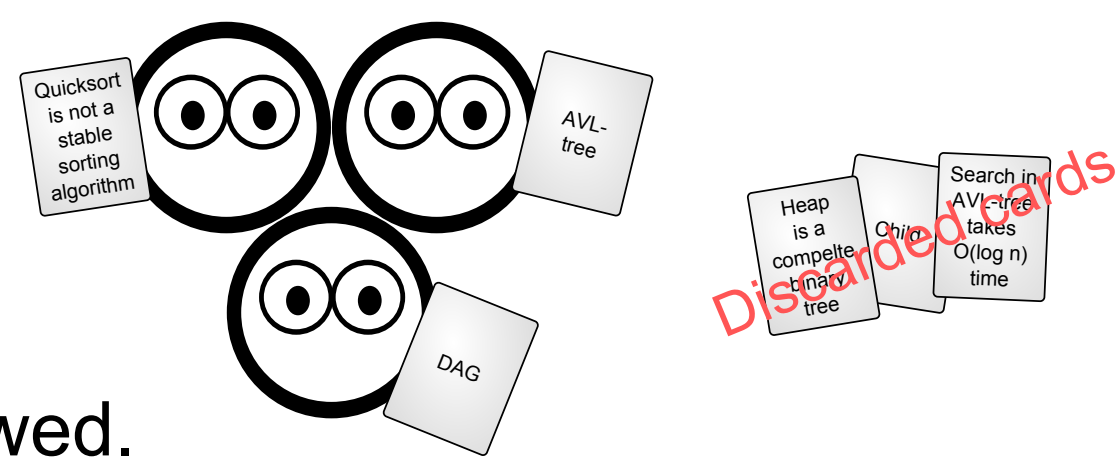
- Two teams
- Each team is divided into groups of 3
- Each group receives six cards (1 easy, 2 medium, 3 hard)



#### Gameplay

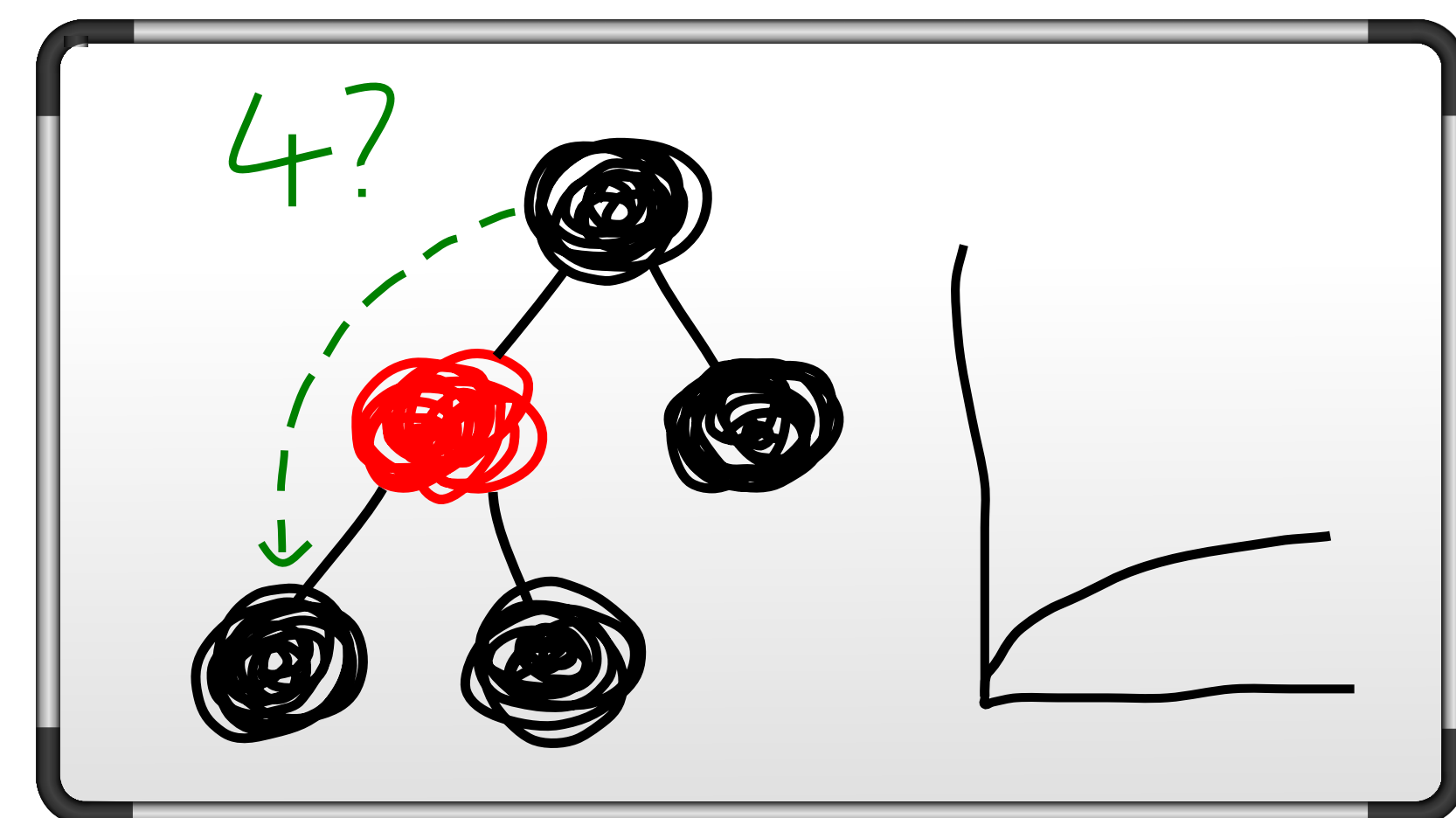
##### Planning phase

- Planning time: 15 minutes.
- Each player must choose 1 card.
- Collaboration within the group allowed.



##### Drawing phase

- One at a time, each player draws his/her concept to the whiteboard.
- Letters and writing is forbidden. Numbers and symbols are allowed.
- Own team members try to guess the concept within the time limit of the card.
- If the own team guesses the answer correctly in time, points are awarded based on the value of the card (1p, 3p, or 5p).
- If nobody guessed it, there will be 1 min extension when both teams are allowed to guess.
- Correct answer during the time extension is worth 1 point.



Example drawing

##### End of game

- The team with the most points, after everyone has drawn, is the winner.

### Design rationale

#### Motivation

Our aim was to design a game that would support collaborative learning and have a high level of engagement with the visualization, using several forms of engagement described in the engagement taxonomy [1].

#### Planning phase

- Collaborative learning situation.
- Players construct visualizations.
- Game strategy in form of choosing easy/medium/hard cards.

**Forms of engagement:**  
constructing, presenting

#### Drawing phase

The drawer is actively presenting and constructing the drawing as others are trying to guess the answer.

**Forms of engagement:**  
Drawer: constructing, presenting  
Others: viewing, responding