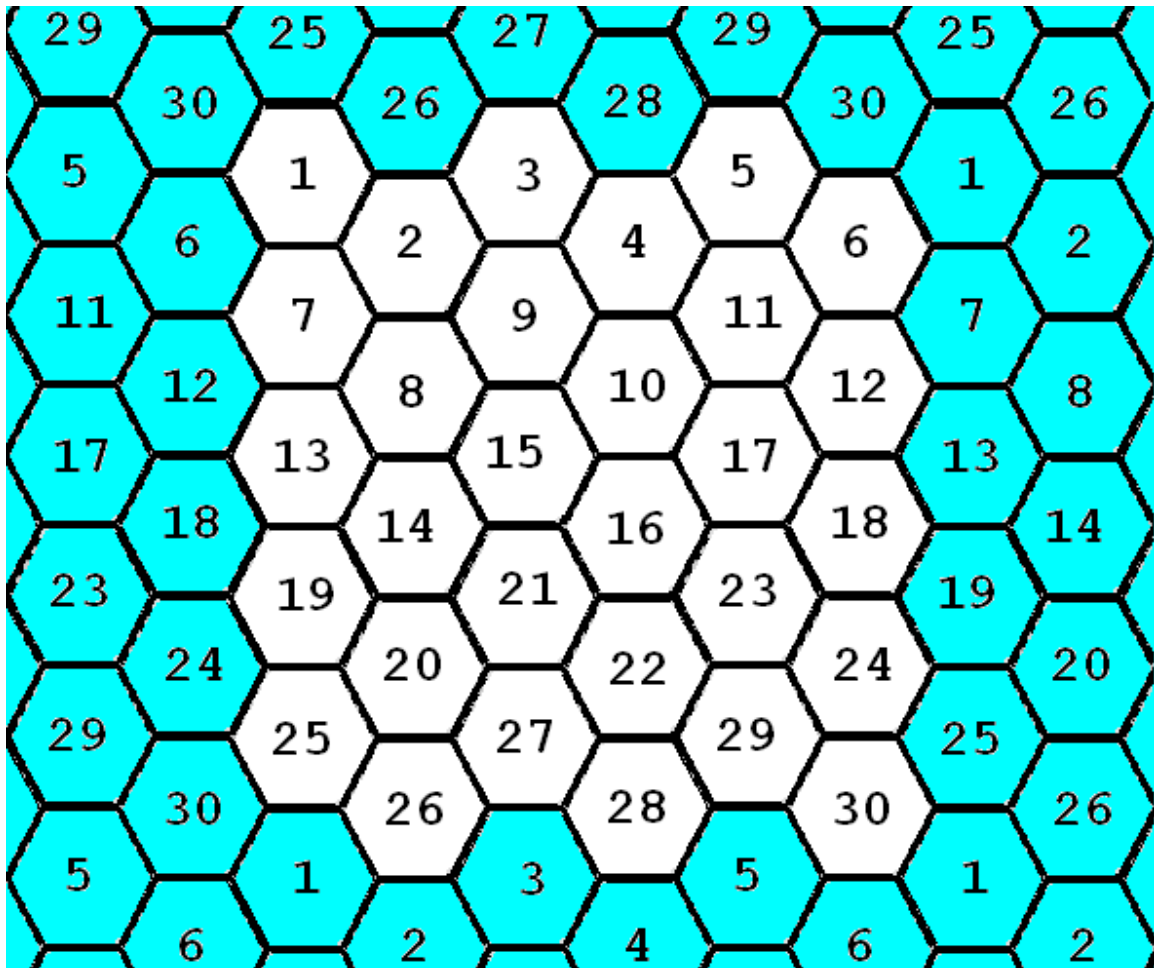


# Hunt The Wumpus!

## Game Specification

The Wumpus lives in a cave of 30 rooms. The rooms are hexagonal. Each room has up to 3 tunnels leading to other rooms. The rooms on the edges can be connected to the rooms on the opposite edge. The Diagram below demonstrates the cave layout and numbering (note that the player could travel from room 6 directly to room 30 or room 1, if room 6 connects to them).



### *The Cave*

You will need to create at least 5 different caves that the user can pick to play in. Each cave will have different sets of tunnels leading between the rooms such that in some caves you will be able to get between two adjacent rooms that you can't move between in other caves. There should be no unreachable rooms in any caves.

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## ***Hazards***

Bottomless Pits - Two rooms have bottomless pits in them. If you go there, you fall into the pit. You can get out of the pit by getting at least 2 out of three trivia questions right. If you get out of the pit, you will be placed back where you started the game.

Super Bats - Two other rooms have super bats. If you go there, a bat grabs you and takes you to some other room at random. After the bat take you to a room, it will fly away to another random room.

No room will have more than one hazard. The Wumpus is not considered to be a hazard.

## ***Wumpus***

The Wumpus is not bothered by the hazards (he has sucker feet and is too big for a bat to lift.) Usually he is asleep. Two things wake him up: your entering his room or your shooting an arrow.

If the Wumpus wakes, he sometimes runs to the next room at a random direction. If you happen to be in the same room with him, you have to fight the Wumpus.

## ***The Player***

Each turn you may move, shoot an arrow, purchase more arrows, or purchase a secret.

*Move:* You can move one room at a time.

*Arrow:* You start with 3 arrows. If you ever run out of arrows without killing the Wumpus, you lose. Each arrow can be shot into an adjacent room. You aim by telling the computer which room you want to shoot into. If the arrow hits the Wumpus, you win.

*Purchase Arrows:* You can purchase 2 more arrows by getting at least 2 out of three trivia questions right.

*Purchase a secret:* You can purchase a secret by getting at least 2 out of three trivia questions right. The secrets range from not very useful to very useful. You can be told the room number where a bat lives, where a pit is, if the Wumpus is

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within 2 rooms of you, or the room number where the Wumpus is currently. However, you might also be told what room number you are currently in or the answer to a trivia question you have gotten wrong.

### ***Warnings***

When you are one room away from Wumpus or hazard, the computer says:

Wumpus - I smell a Wumpus!

Bat - Bats Nearby

Pit - I feel a draft

### ***Fighting the Wumpus***

If you wind up in the same room as the Wumpus you must get 3 out of 5 trivia questions correct. This only wounds the Wumpus, though. He doesn't like to get beat in a fight and will run at least 2 rooms away, but can run up to 4 rooms away if he loses a fight. If he wins the fight, you lose the game.

### ***Money and Trivia***

On every turn that you move through a tunnel, you will be given a gold coin and be told a piece of trivia. There are 100 gold coins to collect in total. Every time throughout the game that you have to answer a trivia question it will cost you a coin to attempt to answer the question. Whether you get it right or wrong, it costs you one coin and you will never be asked that question again before the end of the game. If you ever run out of coins, you lose.

Conflicts occur at various times in the game, such as encounters with the wumpus. These conflicts are resolved in this specification by asking the user to answer trivia questions.

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## **Scoring**

The object is to kill the Wumpus in as few moves as possible. If you do, you will get 100 points! If you kill the Wumpus, your score will be computed with the following equation:

$$100 \text{ points} - N + G + (10 * A)$$

N = number of turns  
G = number of gold coins you have left  
A = number of arrows you have left

The top 10 scores should be kept on file and include all of the information that made up the score (N, G, and A) as well as the player's name and which cave was played.

## **User Interface**

At a minimum, the user interface should include a bird's eye (looking from the ceiling of the room on down) view of the room you are in and an accurate depiction of the tunnels and which rooms they lead to. You will need to display at all times the number of coins the player has collected, the number of turns the player has taken, and the number of arrows the player has left.

You will also need to consider designing a user interface which will need to display secrets, hints, trivia information, trivia questions, number of correct trivia questions and number of questions needed for the current goal (at least when answering questions) and allow for user input when necessary.

You will need to record the player's name and let them choose which cave they want to play in before the game starts.

When not playing, the top 10 high scores should be displayed and pressing enter starts the game.

## Object Descriptions

Object purpose summaries:

- **High Score object:** Manages the high scores (including saving high scores and displaying a high score scoreboard).
- **Trivia object:** Manages the trivia questions for the game (including asking questions and loading questions from a file).
- **Map object:** Keeps track of the locations of the player, the Wumpus, and the hazards. Also keeps track of the cave and handles Wumpus movements.
- **Player object:** Keeps track of the player's inventory and score. (This object will be written by the same person doing the Map object).
- **Cave object:** Keeps track of which rooms in the cave are connected to which other rooms. (i.e. the blueprints)
- **Graphics Engine object:** Displays the state of the current game (the current room, connected rooms, inventory, wumpus, etc.).
- **Game Control object:** Handles user input (except for High Score and Trivia), coordinates all the other parts of the game.
- **Sound object:** Plays sounds for the game, from a selection of different themes.
- **User assistance object:** Teaches the user how to play, provides the hints, provides 'game cheats'.

### ***The Game Control Object***

The Game Control Object coordinates all of the other pieces of the game:

- The Game Control Object keeps track of the game state (Currently playing a game, displaying the splash screen, displaying the high scores).
- The Game Control Object accepts and validates user input (that is, player commands and game control commands). The trivia and high score objects will manage their own user input.
- The Game Control Object interacts with the Map Object, the Player Object, the Graphical Interface Object, the Trivia Management System, the Sound object, the User assistance, and the High Score Management System.
- Some aspects of the Game Control Object should be exposed to the user through a "main menu" that allows the user to launch the game, display high scores, or exit.

### ***The Graphical Interface Object***

The Graphical Interface Object is the object which does the actual drawing to the screen during the game. The tasks the Graphical Interface Object performs are as follows:

- Display on the game screen a representation of the room, including the hexagonal form of the room, with each edge illustrated as either a tunnel to an adjacent room or a wall blocking access to an adjacent room. Include an illustration of the player, any present hazards, the wumpus if present, and any additional graphics that add to the realism of the cave.
- Display on the game screen the player's score.
- Display on the game screen the player's inventory.
- Display on the game screen any hints based on the player's room. (For example: I smell a wumpus).
- Display on the game screen all actions the player can take on the current turn.
  - Move
  - Shoot an arrow
  - Purchase arrows
  - Purchase a secret

### ***The Map Object***

The Map Object tracks the locations of all of the objects in the current game. The tasks it performs are as follows:

- Store and interact with the cave used for this game
- Keep track of where the hazards are
- Keep track of where the Wumpus is. This includes controlling Wumpus behavior (that is, asleep, awake, moving).
- Keep track of where the player is

### ***The Cave Object***

The Cave Object understands the layout of the cave and manages the data that describes the "connectivity information" for adjacent rooms. Adjacent rooms may either be connected by way of a tunnel, or not connected at all (separated by a wall). The tasks it performs are as follows:

- Read and parse map data from a file
- Stores connectivity information for each room in the map.
- Keeps an internal data representation of the map sufficient for obtaining and keeping track of all necessary information

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## ***The Player Object***

The Player Object keeps track of the player and all information associated with the player. The tasks it performs are as follows:

- Keep track of player inventory
  - Arrows
  - Gold coins
- Keep track of how many turns the player has taken
- Compute ending score of player

## ***The Trivia Management Object***

This component of Hunt the Wumpus is used to resolve conflicts and purchases during gameplay, and provide secrets or hints that help the user to progress through the game. The user will interact with it, when it is called by other game objects for the following:

- Purchasing additional arrows: 2 out of 3 trivia questions must be answered correctly.
- Purchasing a secret: 2 of 3 correct answers.
- Saving from a bottomless pit: 2 of 3 correct answers.
- Escaping the Wumpus: 3 out of 5 correct answers.

The Trivia Management System will handle asking questions and getting the user response itself.

## ***The High Score Management Object***

This component of Hunt the Wumpus manages scores achieved by players that have won the game. The user will interact with this component in two ways:

- Storing a new high score
- Viewing existing high scores

The default high score data for the game should be the names of all of the participants in this project, with zero scores and arbitrary cave names.

The high score data will be exposed in a couple of ways: the user will be able to bring up the high score table through the game's menu system, and the high score table will automatically be displayed after a player finishes a game.

At no time will there be more than 10 scores tracked by the *High Score Management System*. If a new score is submitted, that is good enough to be included in an already-full high score table, the new score will cause the lowest other score to be removed automatically.

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### ***The Sound Object***

The Sound object is responsible for playing sounds upon requests from the Game Control object. The tasks it performs are as follows:

- Reads list of sound files from its configuration file.
- Sounds files are grouped into sound themes (alternative sets of sounds).
- The Game Control object gets a list of available sound themes from the Sound object and selects (randomly or based on user's input) an active scheme.
- The Game Control object calls the Sound object to play a particular game sound (player moves, player shoots an arrow, wumpus moves, trivia pops up, win, lose, etc.) from the selected theme.
- The Sound object opens and plays the sound file that contains the requested sound.
- There should be at least two sound themes.

### ***User Assistance***

The User Assistance object is responsible for helping the user play the game.

Tasks it performs are:

- Presenting the user with an 'instructions' screen to teach them how to play
- Providing the hints and secrets to the user
- Exposing a 'cheat code' that will, for example, let the game developers know where all of the hazards and wumpus are for during game demos.