

steam and early diesel era



OPERATIONS 101

Dan Lewis, MMR

OPERATION: What is It?

What is loosely called “operation” is the running of a model railroad to simulate the operation of either a past or present railroad either real or imagined.

OPERATION INCLUDES

(but is not limited to)

- Dispatching
- Through freights
- Passenger trains
- Local freights with on-line switching
- Yard operations

REMOVING THE FEAR FACTOR

Many model railroaders do not operate because they fear they will “mess up.”



This primer...

...aims at offering sufficient basic information to make that first operation experience fulfilling and fun—and to take away some of the mystery!





RUNNING A TRAIN



PROTOCOLS for Running a Train

While all model railroaders “run” trains, in Operations there are commonly expected procedures that should be observed, such as:

- *Following schedules (conductors)*
- *Brake test (engineers)*
- *Throttle management (engineers)*
- *Whistle signals (engineers)*
- *On-line switching moves (conductors)*

READING A TIMETABLE

GREAT NORTHERN RAILWAY COMPANY

| WESTWARD | | ELEVENTH SUBDIVISION | | EASTWARD | |
|---------------------------|--------------------|---|--------------------|---------------------------|--|
| SECOND CLASS 367 | FIRST CLASS 239 | Time Table No. 66 Jan. 1, 1953 | FIRST CLASS 240 | SECOND CLASS 368 | |
| L4:00am | L7:50am | MOCCASIN | A11:38am | A6:30am | |
| 4:10am | 8:00am |  | 11:32am | 6:20am | |
| 4:50am | 8:20am | LEWISTOWN | 11:30am | 6:15am | |
| 5:20am <small>368</small> | 8:30am | HANOVER | 11:15am | <small>367</small> 5:30am | |
| 5:45am | 8:32am | TETON COUNTY | 11:10am | 5:15am | |
| 6:00am | 8:40am |  | 11:05am | 5:00am | |
| A6:05am | A8:45am | SHELBY | L11:00am | L4:30am | |

Passenger trains must not exceed maximum speed of 40 miles per hour; other trains 25 miles per hour.

Trains must not exceed maximum speed of 10 miles per hour when crossing Spring Creek Trestle 1 mile north of Hanover.

EASTWARD TRAINS ARE SUPERIOR TO WESTWARD TRAINS OF THE SAME CLASS

At GN Jct, the normal position of the junction switch is for the C. M. St. P. & P.

Trains must come to a stop before crossing over Highway 87 at Lewistown and must not exceed 8 miles per hour through Lewistown.

At Spring Creek Jct, the normal position of the junction switch is for the C. M. St. P. & P.

This timetable confers no authority between GN Jct and Spring Creek Jct. C. M. St. P. & P. timetable and rules govern.

FOLLOWING SCHEDULES

Many model railroaders use a “fast clock” (ratios of 8:1 or 6:1 or 4:1 are common).

- *“Time Freights” are freights on the printed Timetable schedule.*
- *“Extras” are not on the Timetable schedule.*
- *If running on a model railroad that employs “fast time,” be sure to note that you may leave late (up to 12 hours late in TT&TO operation), but YOU MUST NOT LEAVE EARLY!*

THE TRAIN CREW

A typical train crew in the steam era consisted of an engineer, fireman, conductor and front and rear brakeman.

- *The conductor was the “boss” of the train.*
- *For model railroaders, a single person can handle all these jobs, or...*
- *...if there is a two-man crew, the engineer handles the throttle and the conductor handles the paper work.*

CLASS

Trains are usually divided into “classes,” with First Class trains having priority over Second Class trains, etc.

- *If you are running a Second Class train and meet a First Class train, you will take the siding and give the First Class train the mainline.*
- *Extras are usually the lowest class train on the railroad; however, the DS may make exceptions due to special conditions (i.e., perishables, livestock, etc.).*

DIRECTION

On most prototype railroads, Eastbound trains were superior to Westbound trains of the same class.

- *If you are running a Westbound train and meet an Eastbound train of the same class, you should take the siding, leaving the mainline to the Eastbound train.*
- *Keep in mind that “meets” involve not only opposing trains, but also trains that may pass others (i.e., a passenger train overtaking a freight train).*

BRAKE TEST

On a prototype train, the brake test was necessary to make sure the gladhands were all connected and the air in the brake line was up throughout the train.

- *Model railroaders, obviously, do not connect air hoses.*
- *However, the standard practice (going back at least to John Allen) has been for the engineer to pull the slack out of the couplers to make sure all the cars in the consist are properly coupled. This practice serves as a surrogate “brake test.”*

THROTTLE MANAGEMENT

Trains are heavy; therefore, they cannot start or stop quickly!

- *The most common mistakes of the novice (and small children) are jack rabbit starts and screeching halts.*
- *Slow, smooth movements are the order of the day (such movements may be controlled by momentum throttles).*
- *Headlights are “on” during normal operation.*
- *Mars lights are used at the discretion of the engineer for safety reasons.*

WHISTLE SIGNALS

Engineers use whistle signals to indicate various train movements, etc. This was important, since the crew at the rear end must not be taken by surprise. With the advent of DCC, many model railroaders are now able to use whistle signals.

Some of the basic ones are:

-- -- (*= train commencing a forward movement*)

o o o (*= train commencing a backward movement*)

o (*= train stopping*)

--- (*= train approaching a station, junction or RR crossing*)

--- --- o ----- (*= train approaching a grade crossing*)

TERMINATION

When you reach the end of your run, be sure to do the following:

- *Pull your train into the yard track indicated by the Yardmaster.*
- *Inform the DS that you are “tying up.”*
- *If you are using a DCC controller, “zero out” your engine number so it can be acquired by another operator (usually, this means setting the throttle to train number “0000” or “9999”)*



ON-LINE SWITCHING MOVES

FREIGHT CAR FORWARDING

Most layout hosts have a freight car forwarding system to direct the movement of freight cars from one location to another. Common types are:

- *4-bill car cards*
- *Switchlists*
- *Car-for-car (no paperwork at all)*

Before showing up for an Op Session, take the time to get a general idea of how your host's particular system works.

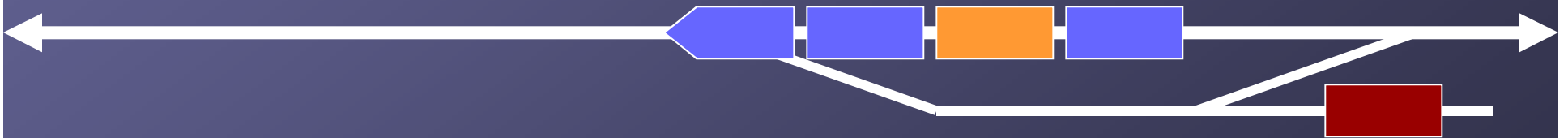
FOUR IMPORTANT WORDS

- **“PULL”** (to remove a car from an industry)
- **“SPOT”** (to place a car in an industry)
- **“SETOUT”** (to take a car out of a train)
- **“PICKUP”** (to add a car to a train)

On-line switching generally consists of making setouts and pickups.

TRAILING POINT SPUR

The simplest switching move for **setouts** and **pickups** is with a trailing point spur.



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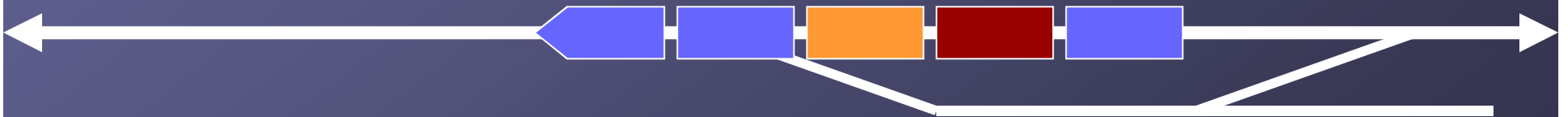
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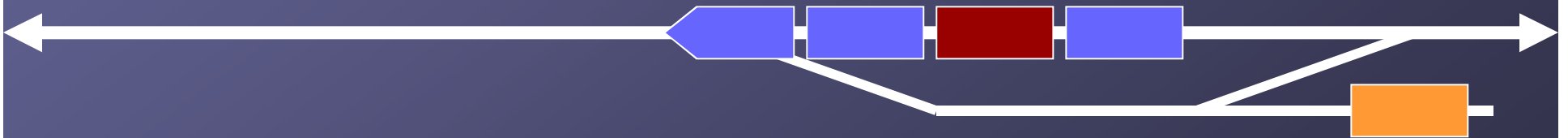
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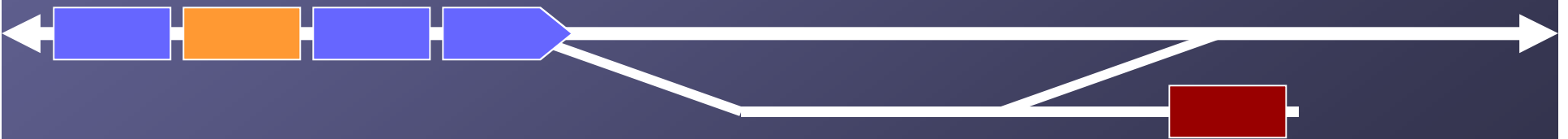
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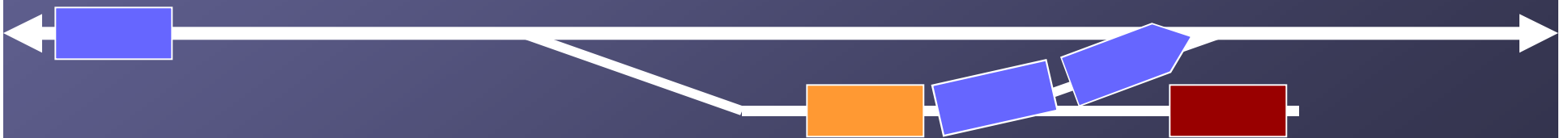
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A facing point spur requires a run-around move for pickups and setouts.



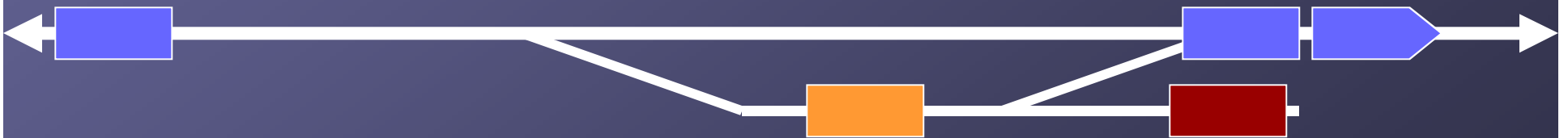
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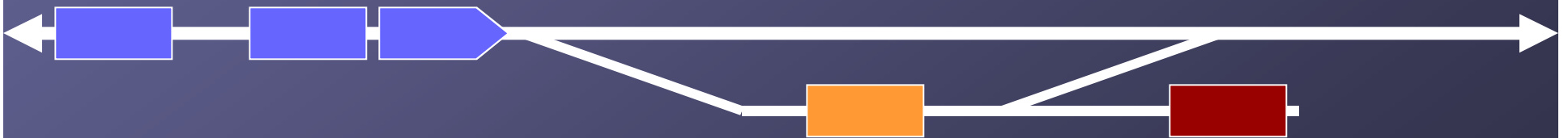
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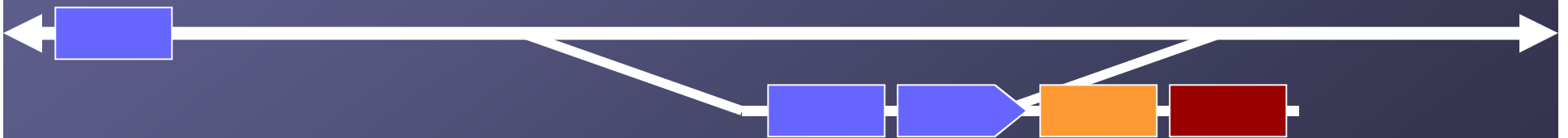
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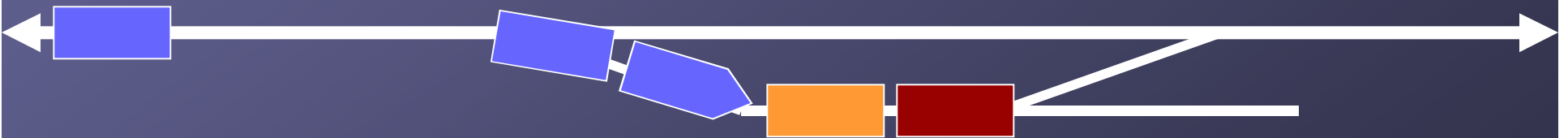
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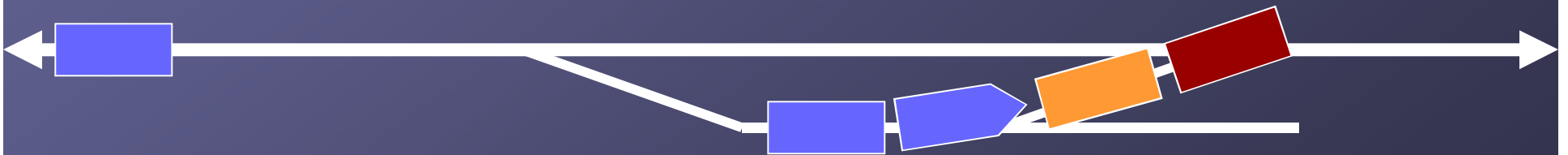
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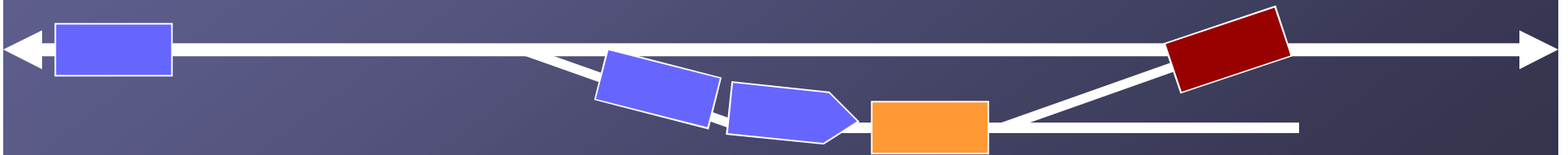
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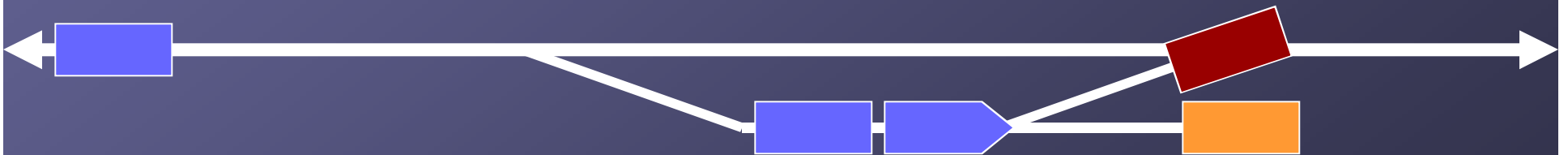
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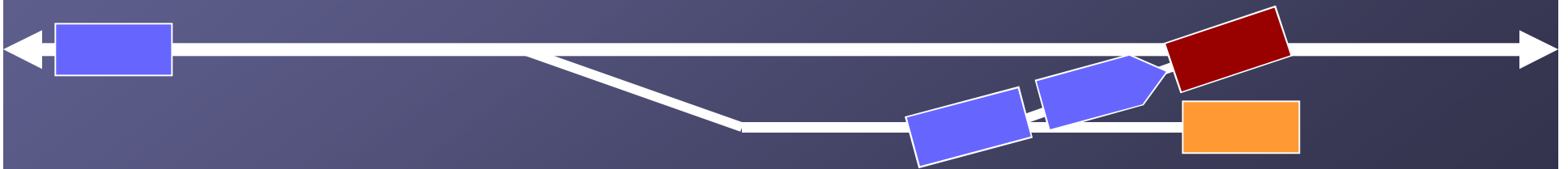
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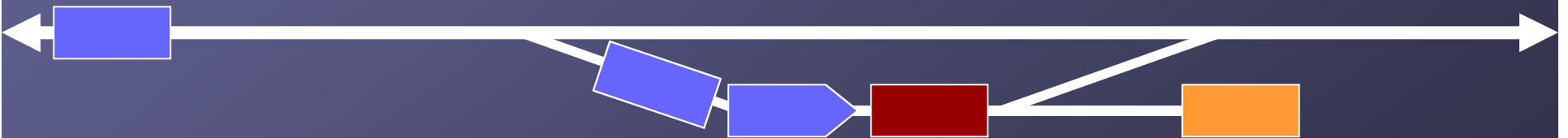
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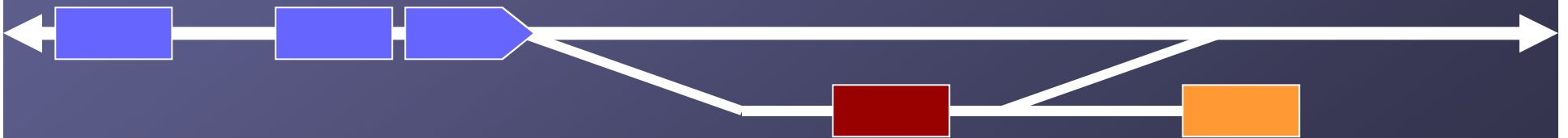
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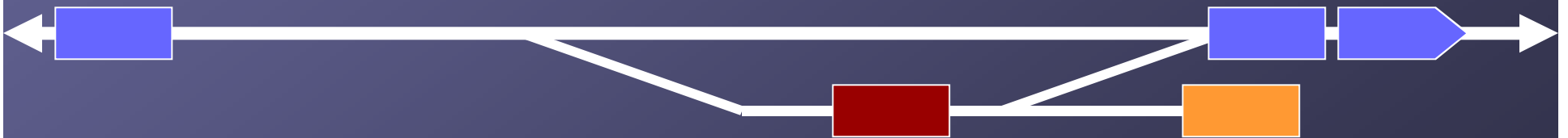
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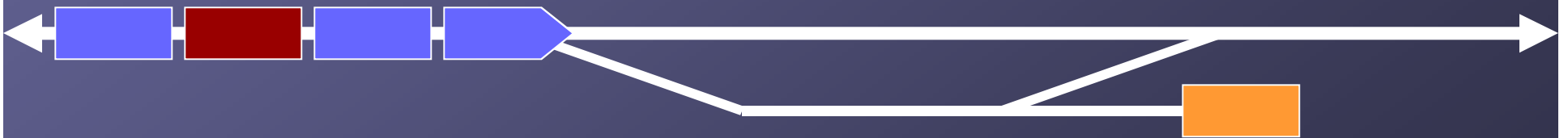
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COMMUNICATIONS

CLEARANCE

Before a train leaves a yard, it must be “cleared” to do so.

- *Depending upon the era and operating system in place, this can be as simple as receiving a verbal indication from the Dispatcher (DS) or it can be as sophisticated as filling out a Clearance Form and marking up on a Train Order board.*
- *Typically, some information is relayed to the DS before clearance, such as:*
 - *Engine Number(s)*
 - *Caboose Number*
 - *Number of cars in the consist*

TYPICAL CONVERSATION

“DS, this is GN Train 367 ready to depart Moccasin Staging. My engines are GN 276 A & B, I have 12 cars in my consist, and my caboose is X242.”

“OK, Train 367, you are cleared to leave Moccasin Staging.”

'OS-ing

The language of reporting a train's location to the DS while on the line is called "OS-ing" (short for "on sheet," i.e., entered on the Dispatcher's Train Sheet).

- *Upon arrival, conductors should OS their locations to the DS at all towns on the schedule.*
- *This enables the DS to know where all trains are at any given time.*

TYPICAL CONVERSATION

“Dispatch’, this is MILW Train 195. We’ve just arrived at Lewistown.”

“OK, Train 195, we have you in Lewistown at 10:35 AM.”

**“GOD MAY KNOW WHERE
YOU ARE, AND YOU MAY
KNOW WHERE YOU ARE,
BUT IF THE DISPATCHER
DOESN'T KNOW WHERE
YOU ARE, THEN GOD
HELP YOU!”**

TALKING TO THE DISPATCHER

Before the days of radio, the DS could only be contacted where there was a telegraph or phone.

- *This means that you could not simply call from anywhere (which is easily possible for model railroaders who have two-way radio headsets).*
- *Hence, communications between the DS and the conductors of trains should be limited to stations or lineside callboxes.*

SIGNALING

Different railroads used different methods for signaling.

- *A “dark line” had no signals (other than semaphores indicating train orders).*
- *Lighted signals eventually developed, though all railroads did not use the same signaling system.*
- *Hence, if you operate on a railroad with signals, don’t hesitate to ask the layout owner for a short primer on how his signaling system works.*



YARD OPERATIONS

CAR EXCHANGE

One of the most important tasks of the yardmaster is freight car forwarding.

- *This means handling pick-ups and set-outs for the passing trains.*
- *Also, if there are industries adjacent to the yard, it may mean handling pulls and spots.*
- *It can include icing reefers for perishables.*
- *It almost always means classification of cars in the yard and/or building trains.*

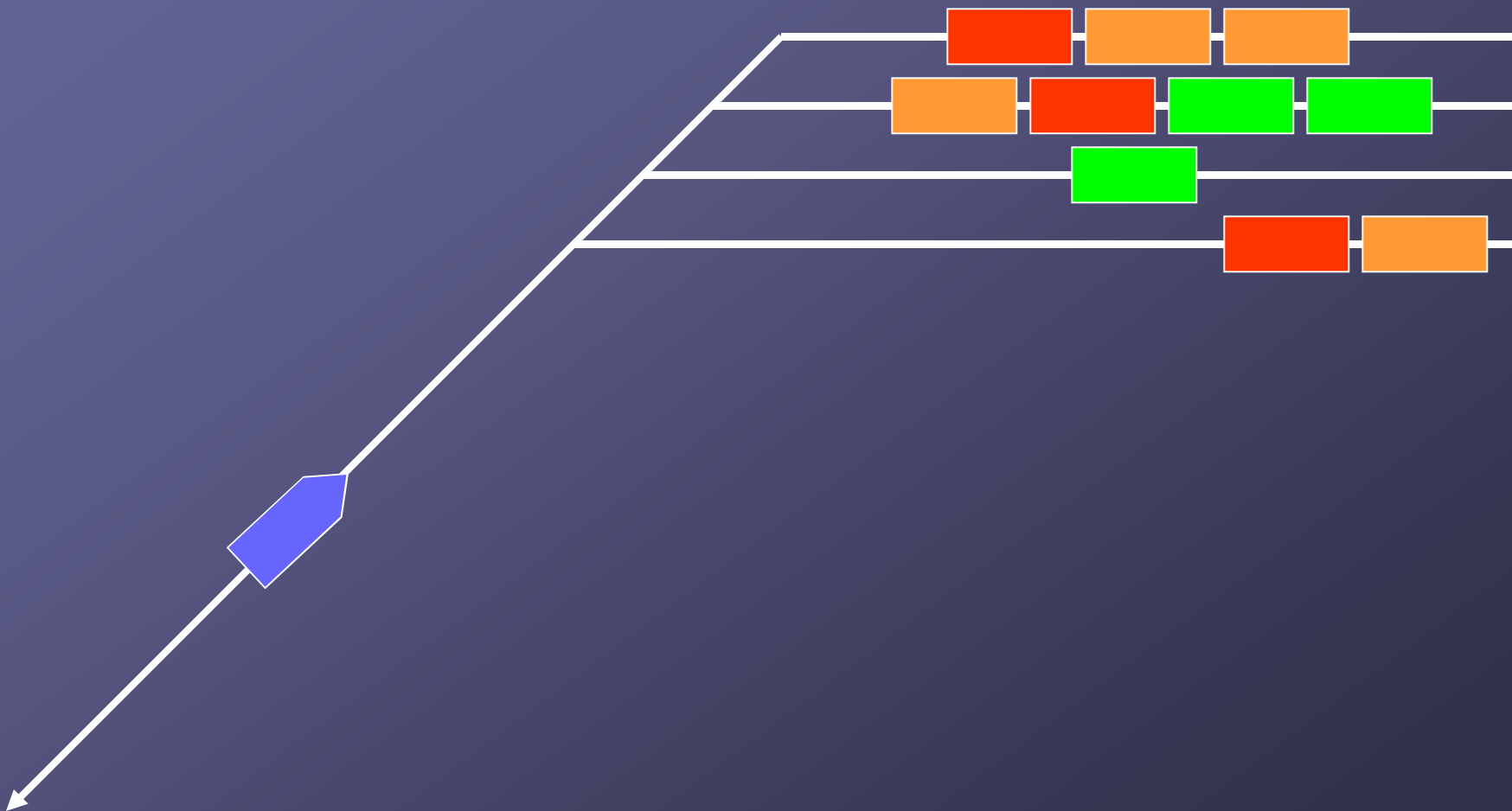
CLASSIFICATION

Classifying cars refers to sorting them in a yard according to specific trains and/or destinations.

- *A through freight will have cars for a single destination.*
- *A local train may stop at various towns en route, and the cars for those towns should be blocked together in the train's consist.*

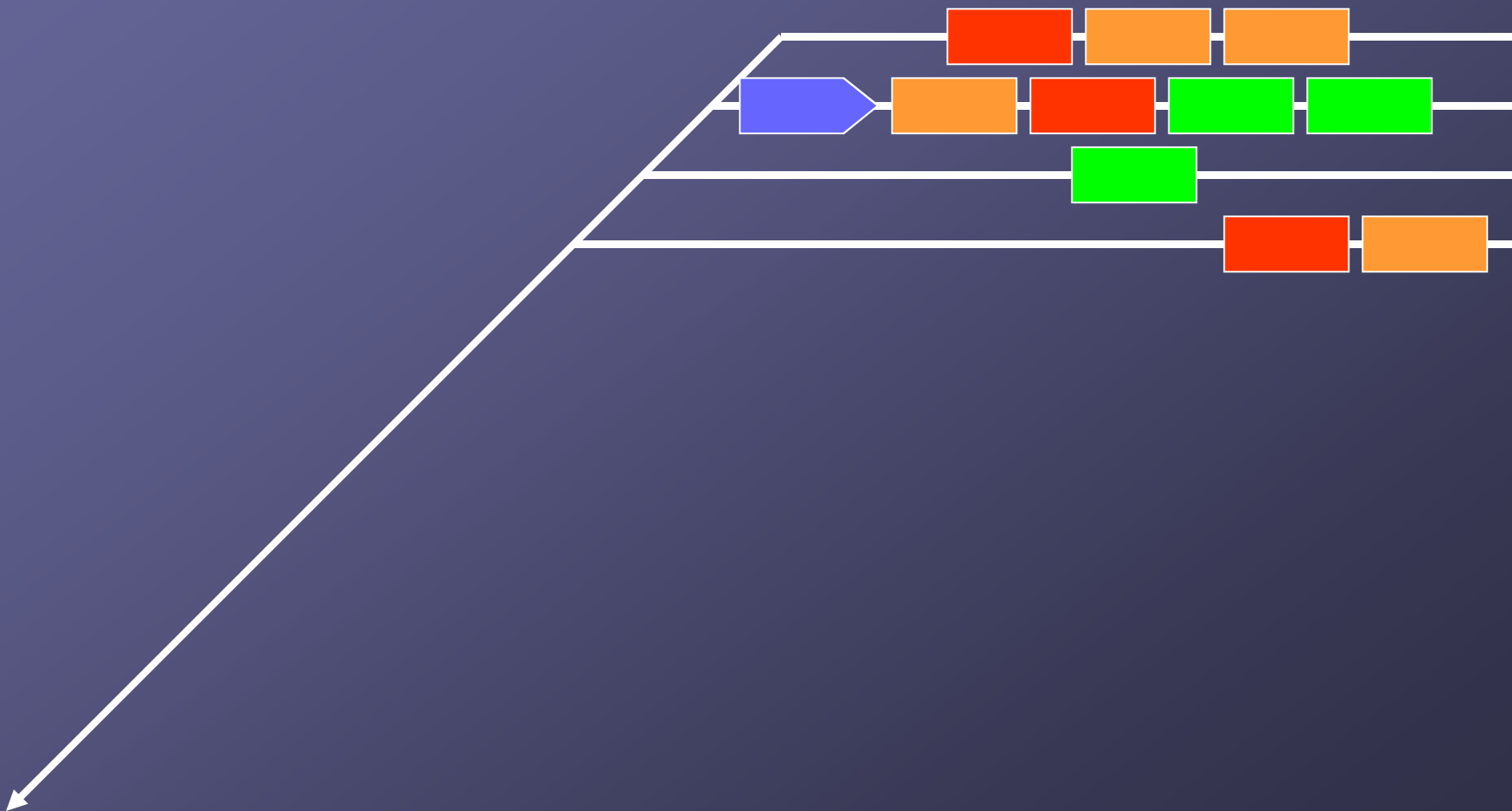
BLOCKING CARS

It is better to classify longer cuts of cars rather than “cherry-pick” one car at a time.



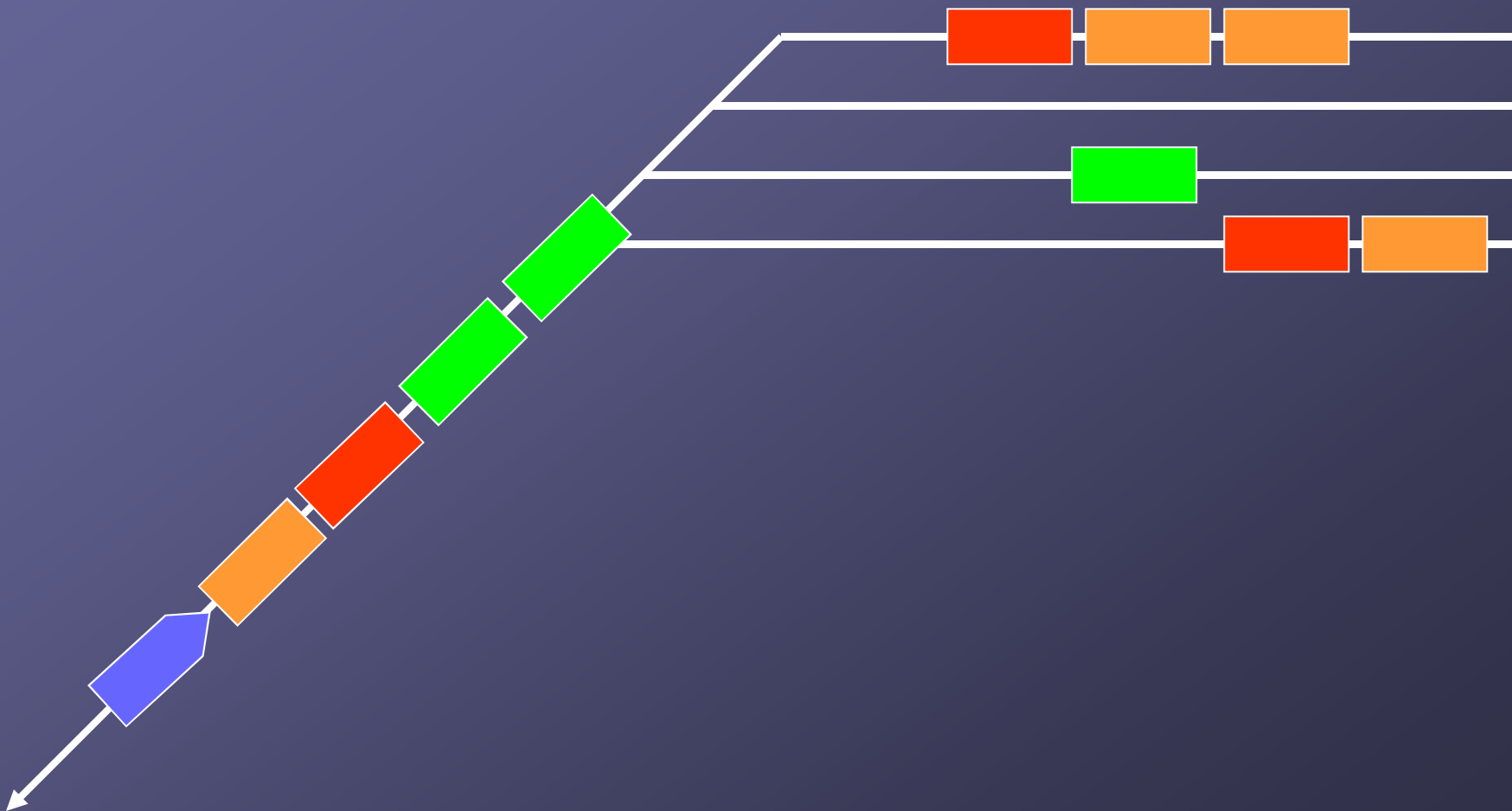
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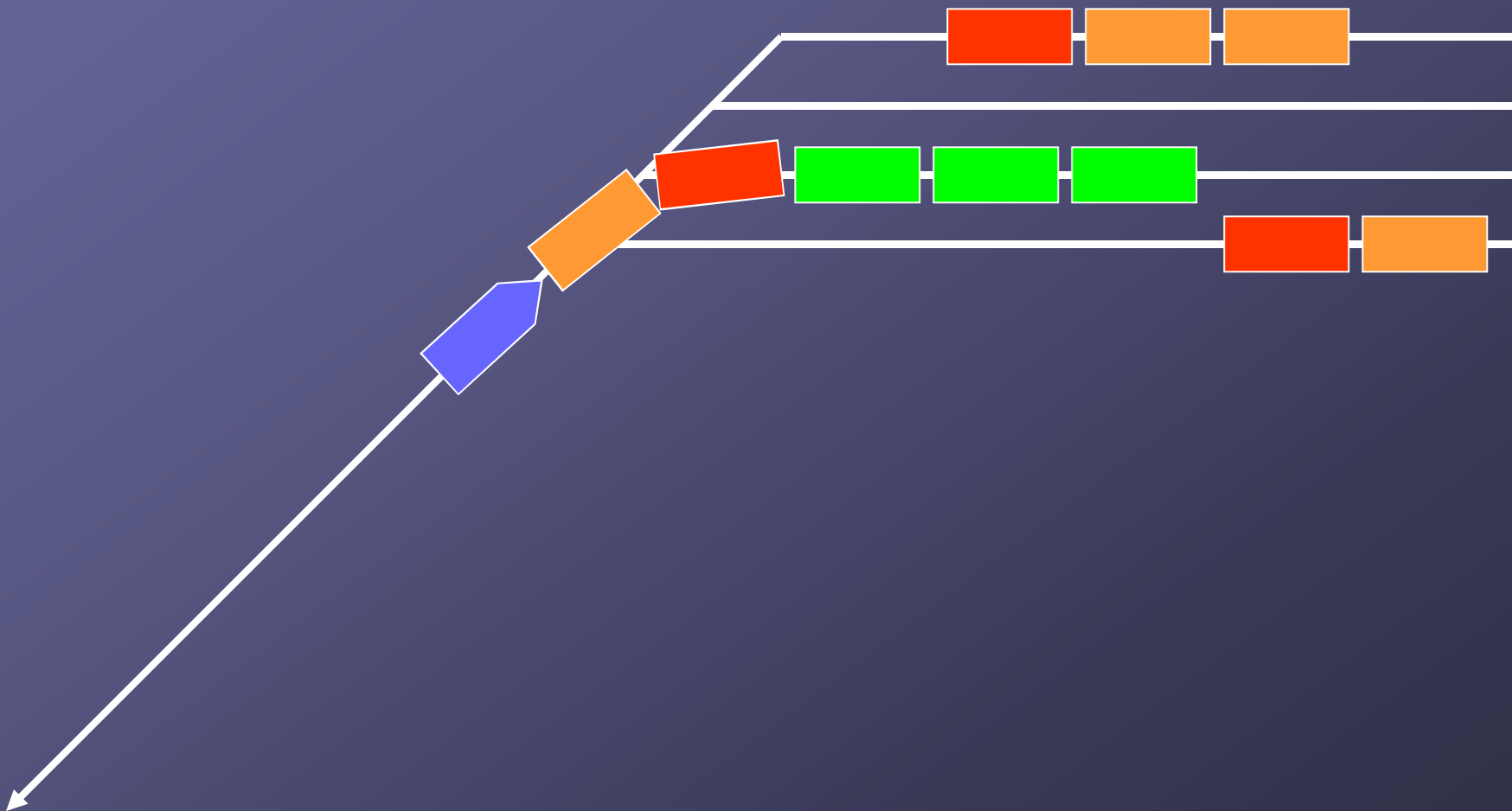
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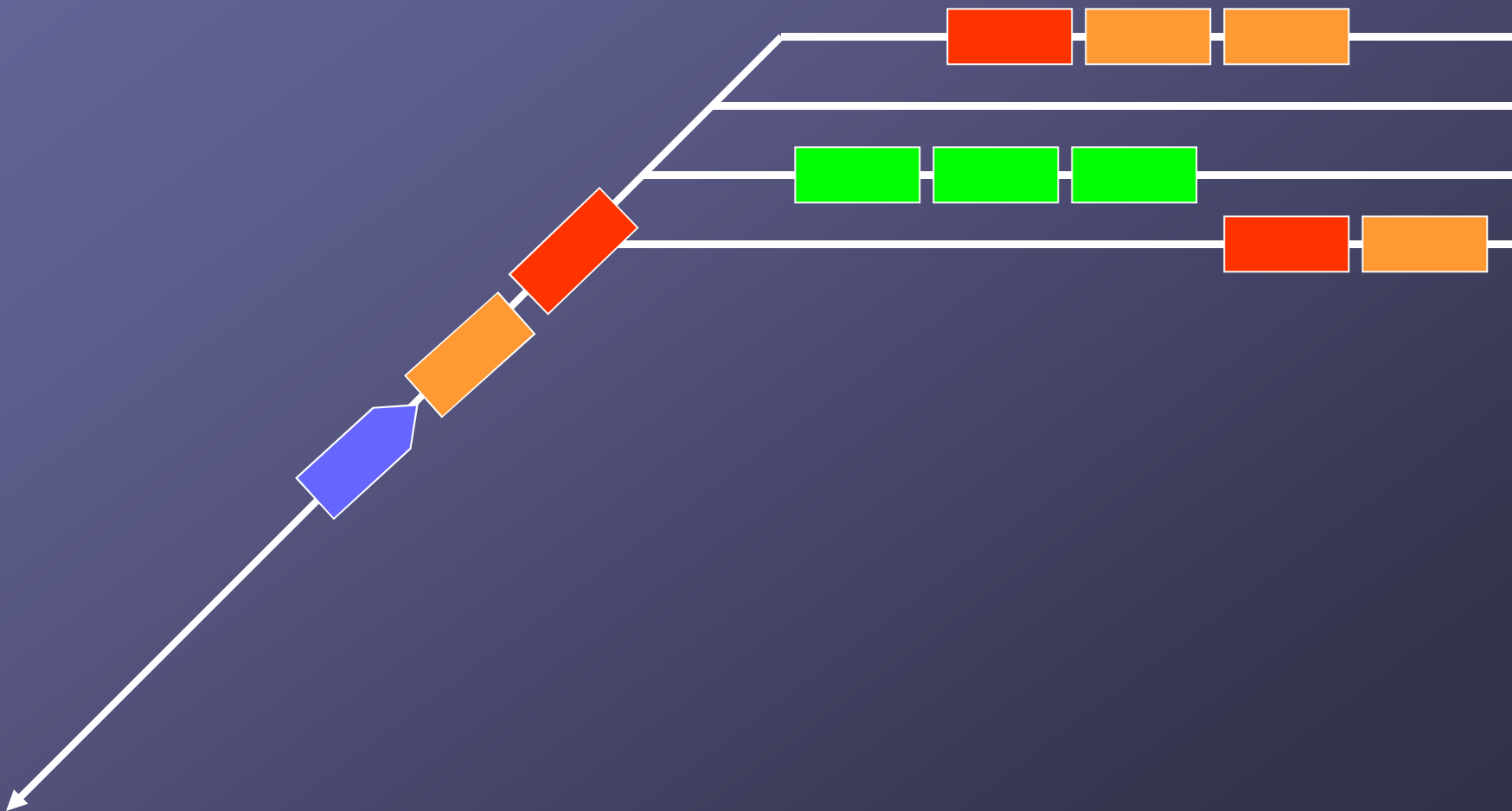
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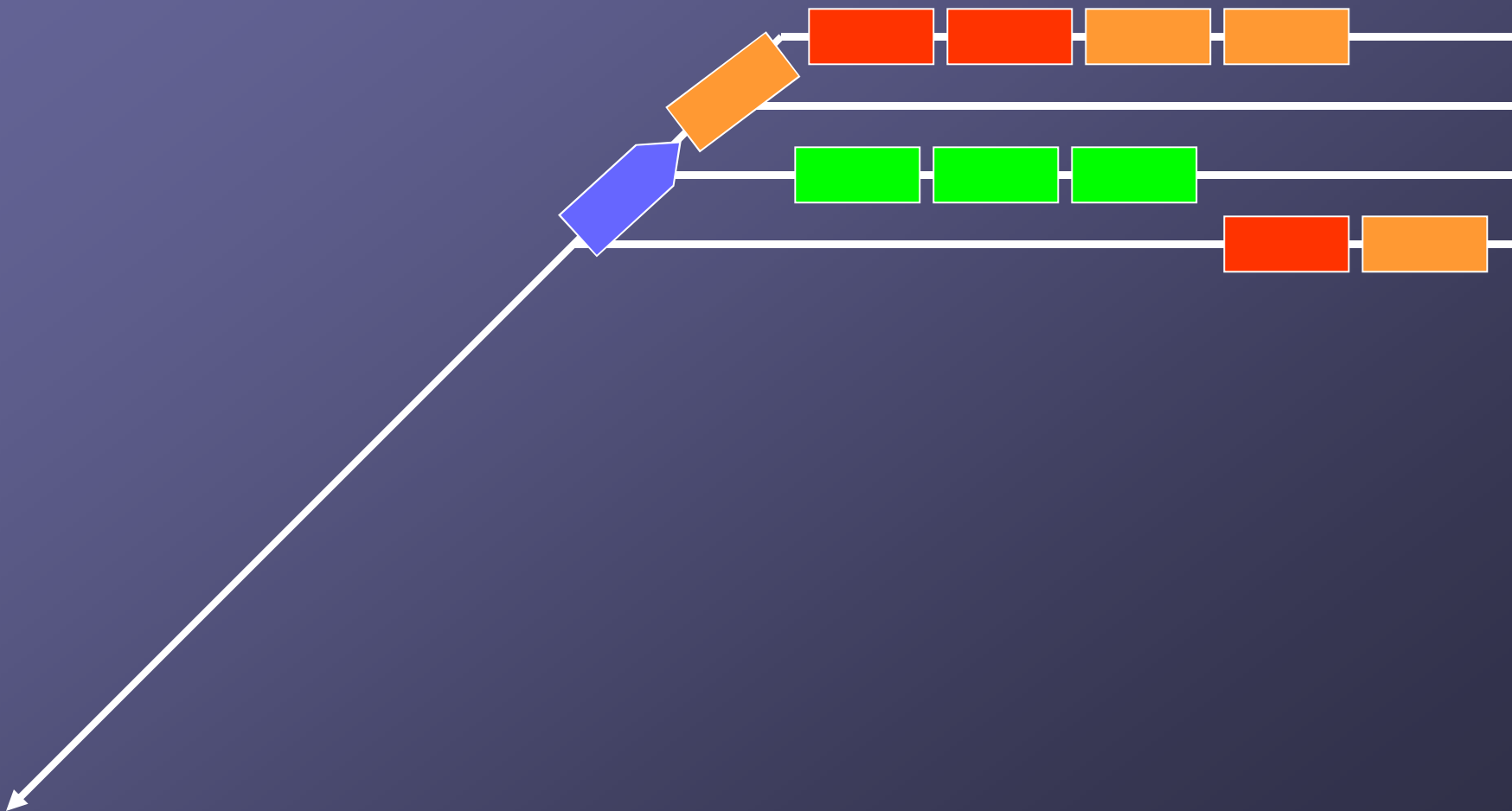
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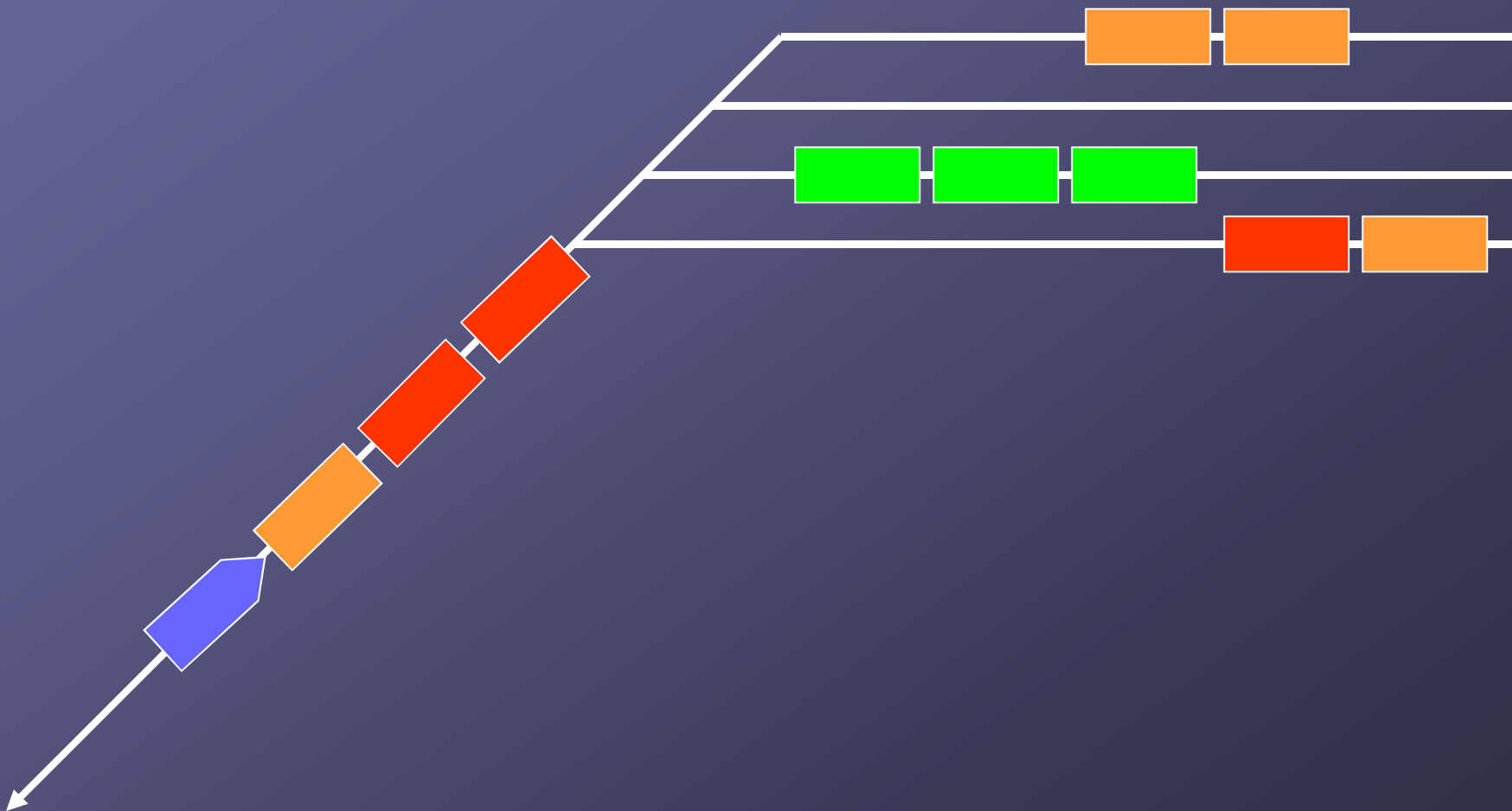
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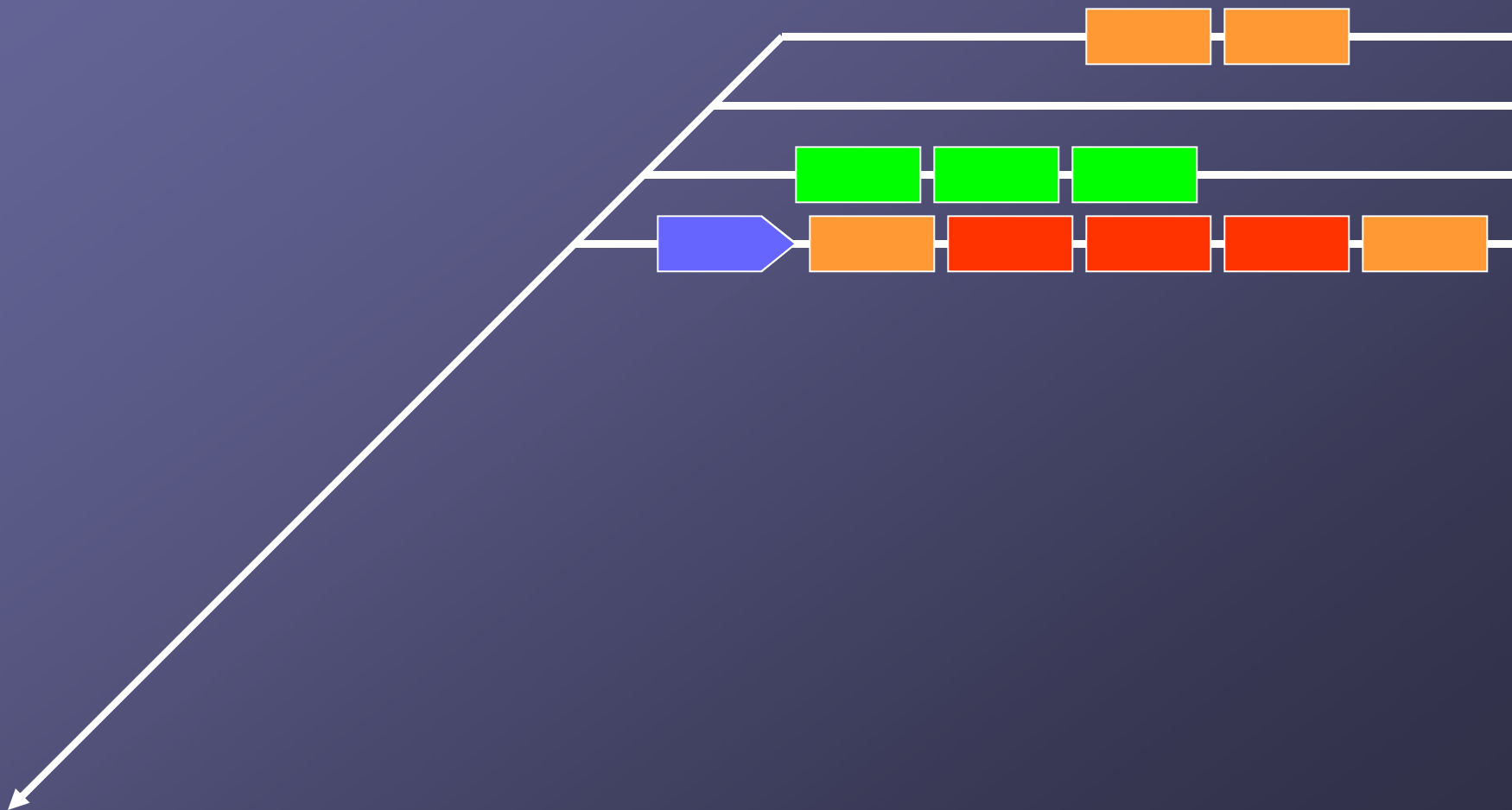
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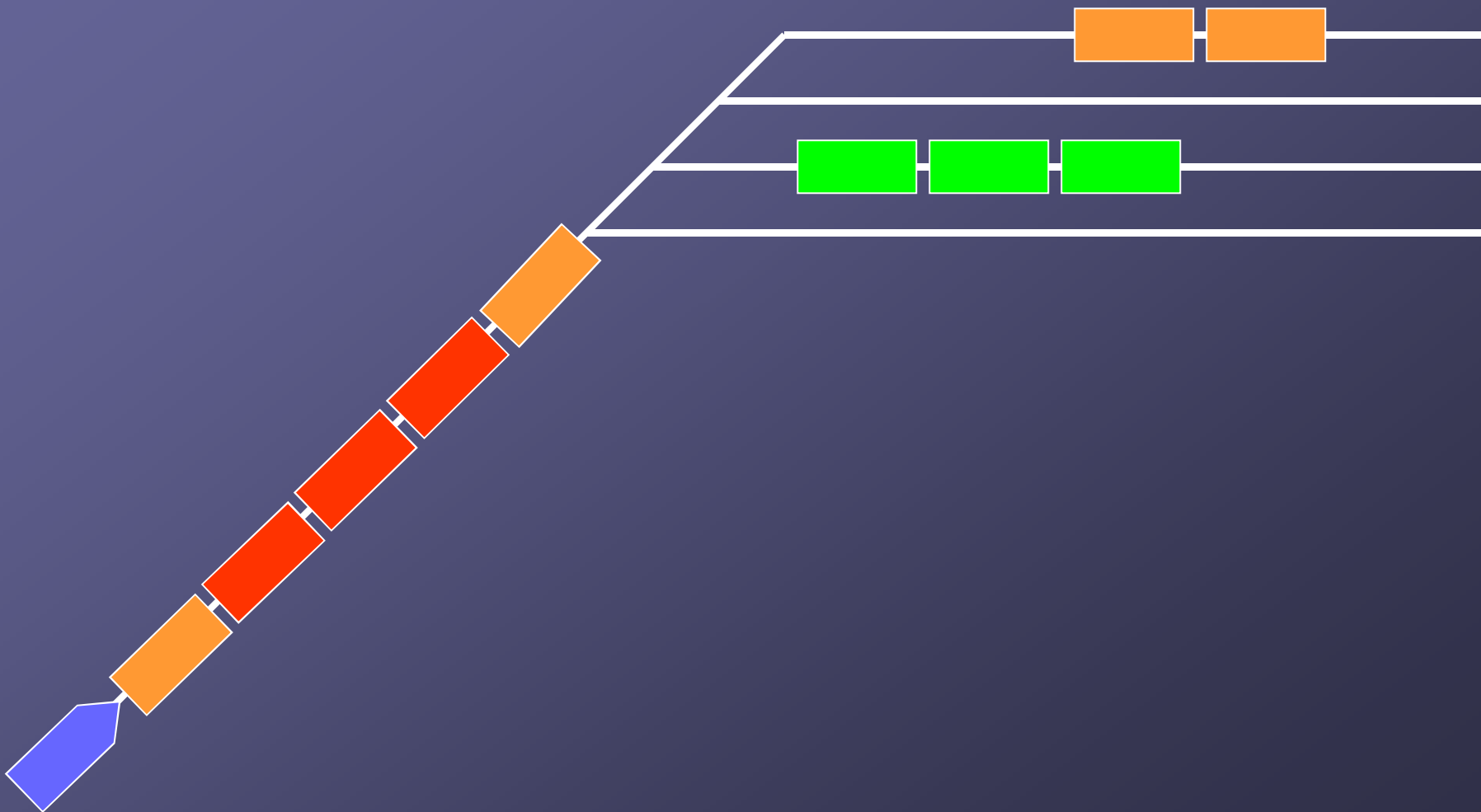
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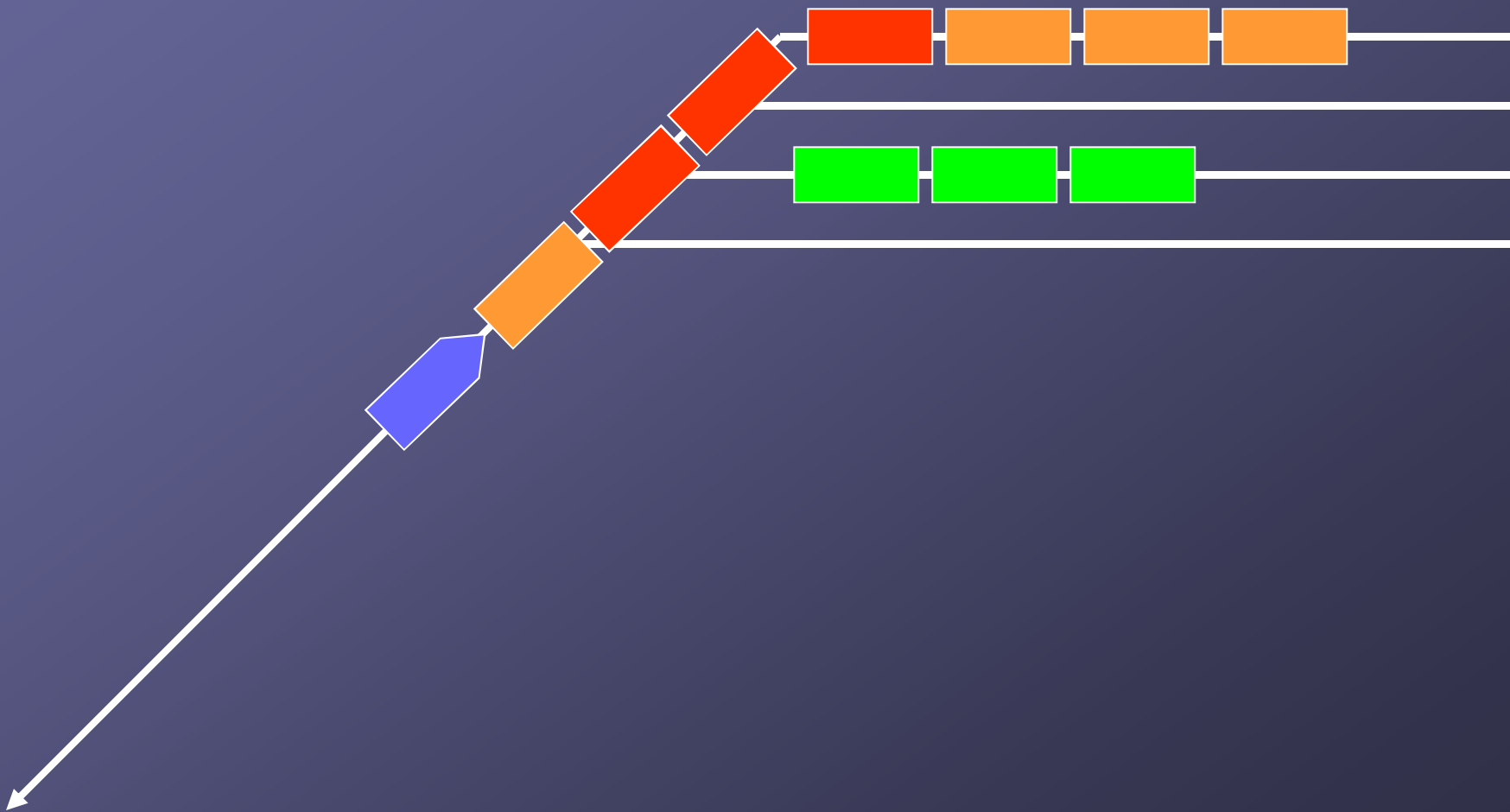
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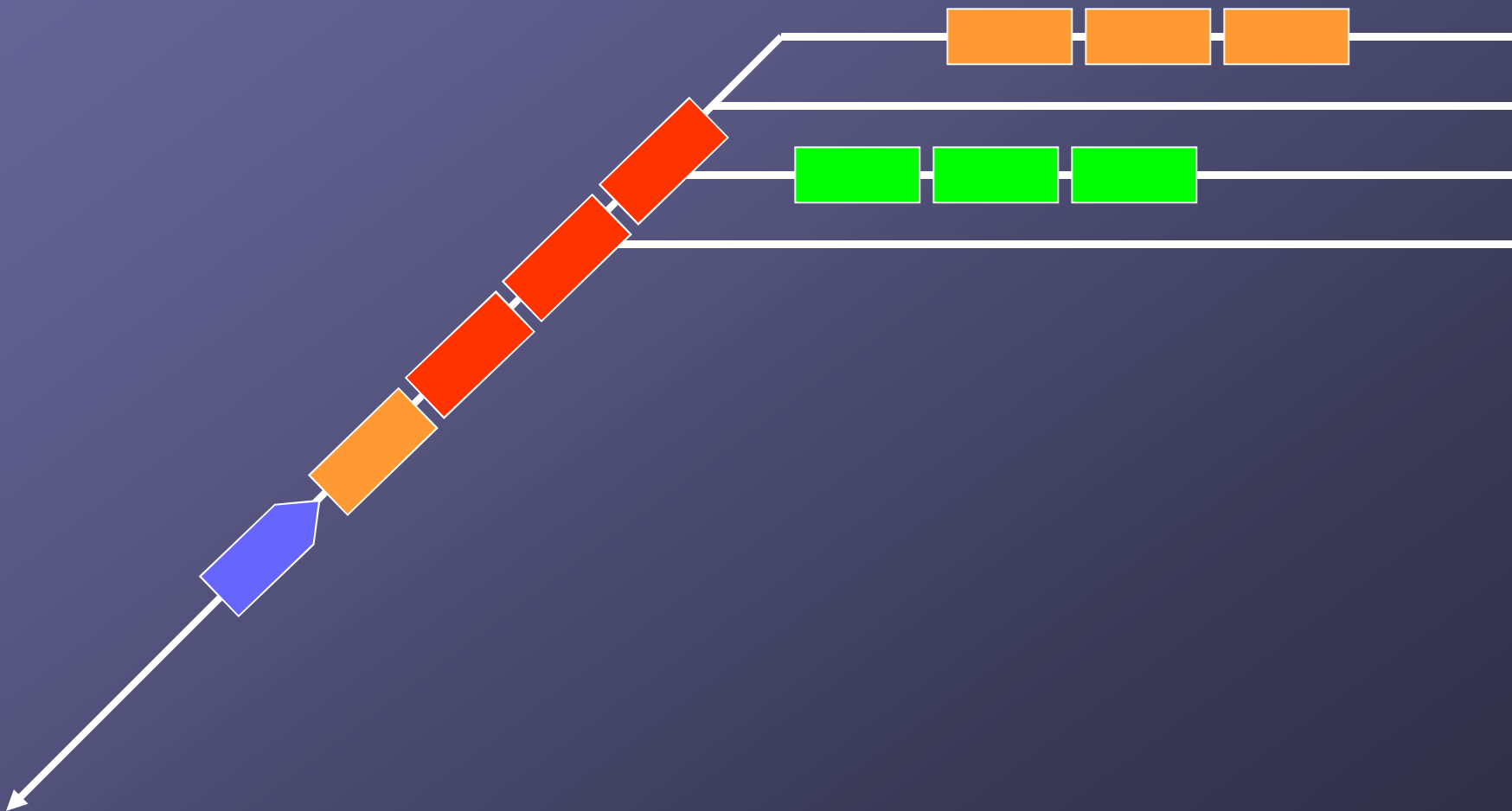
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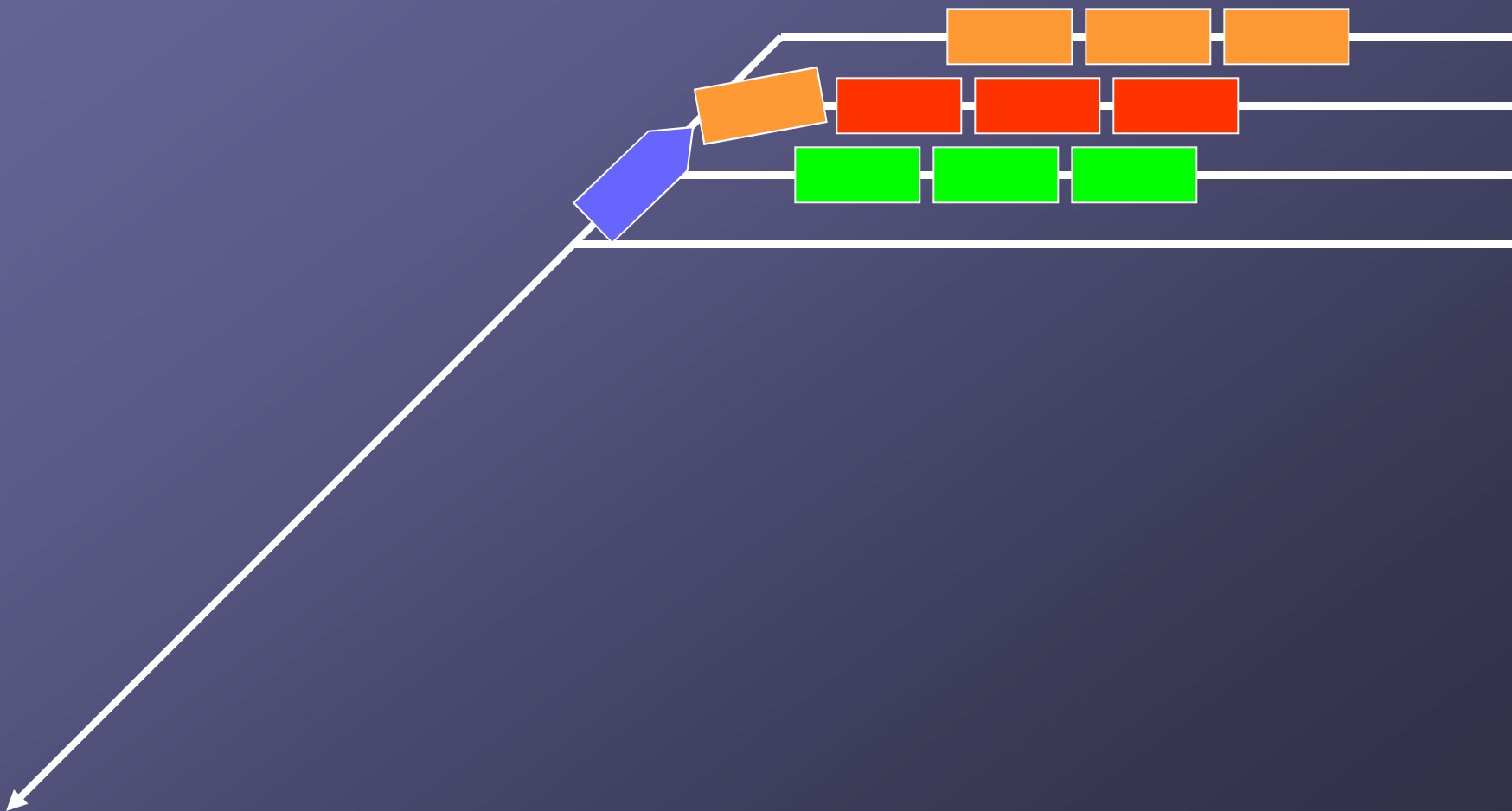
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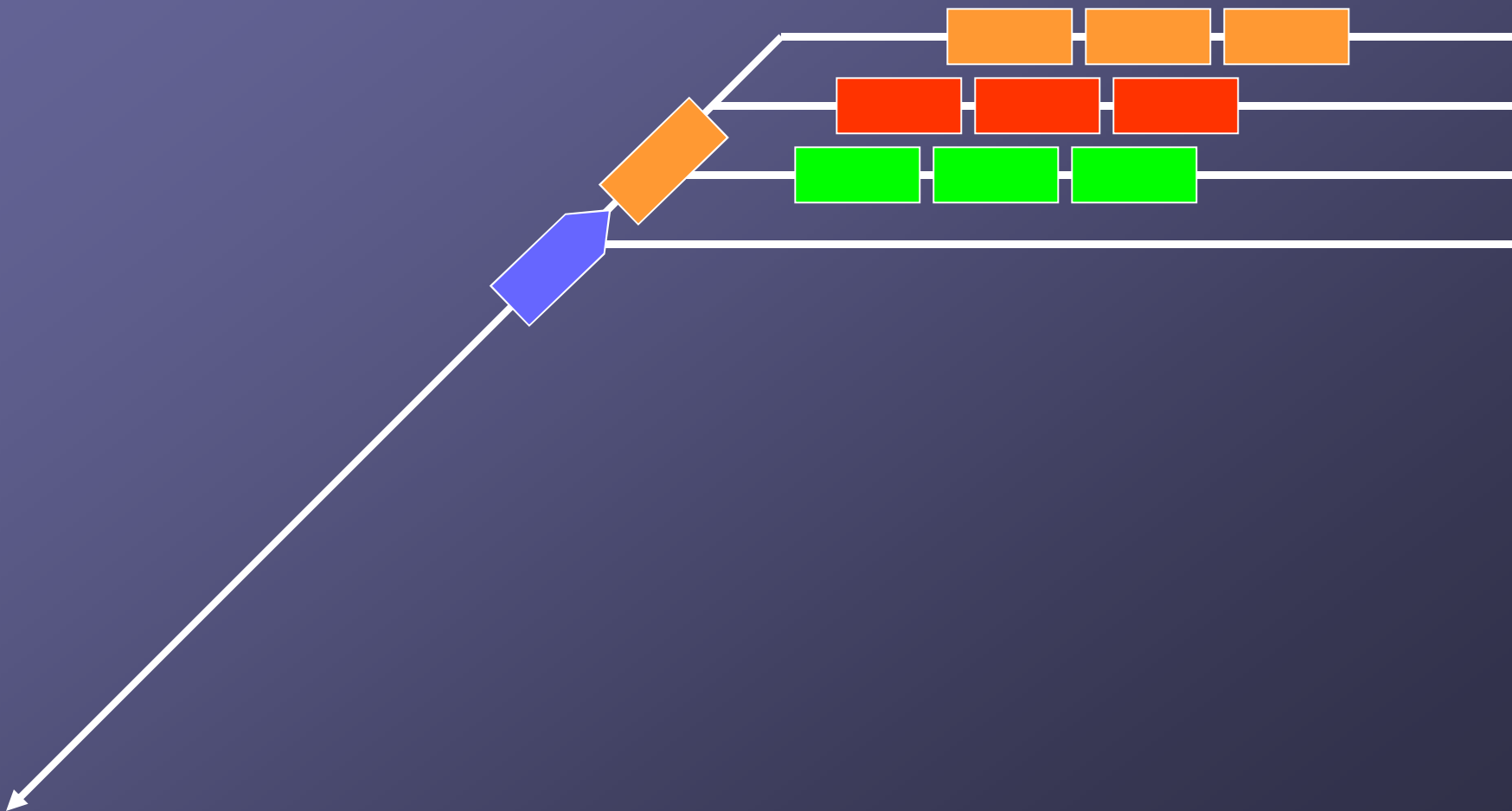
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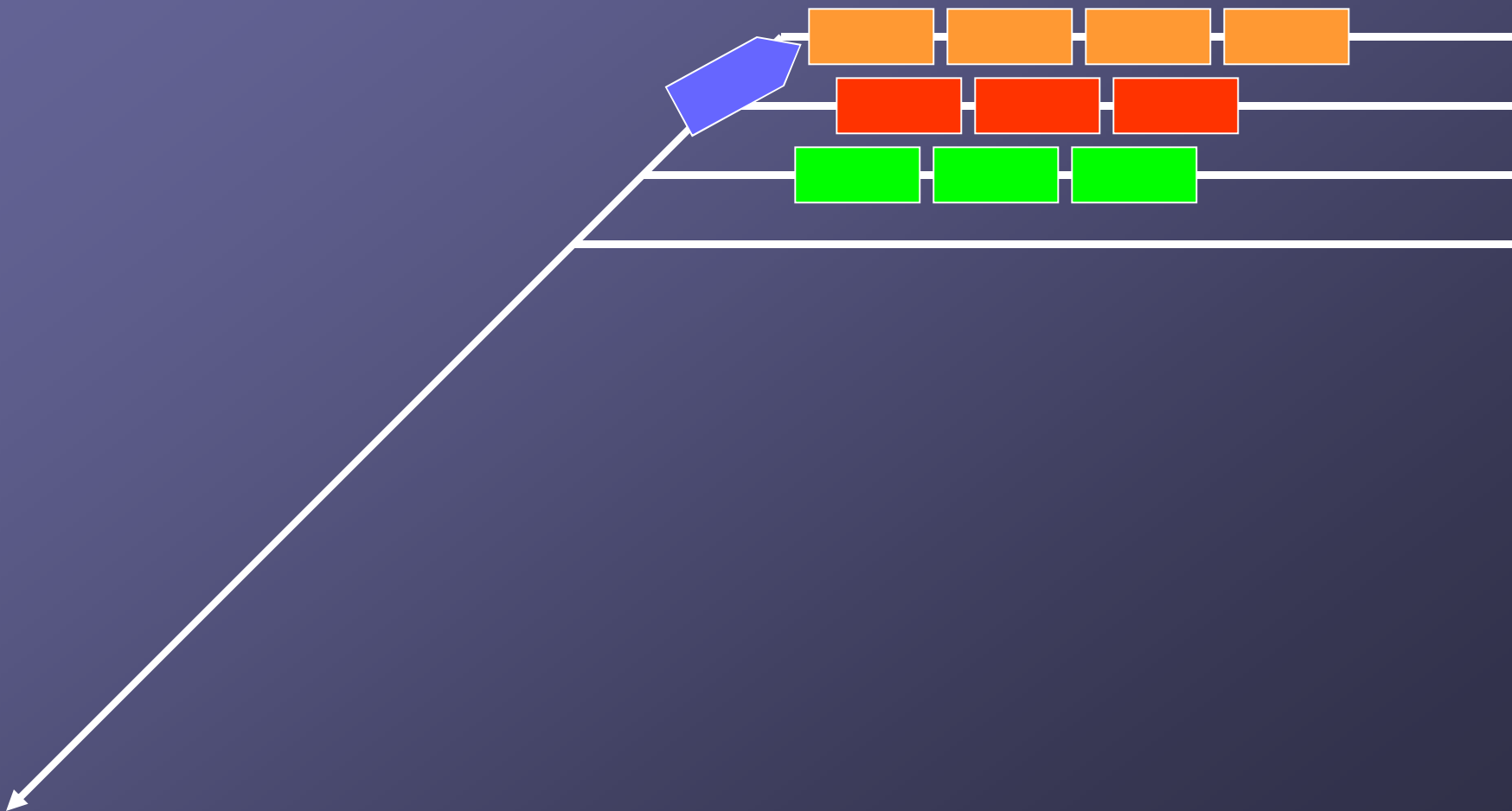
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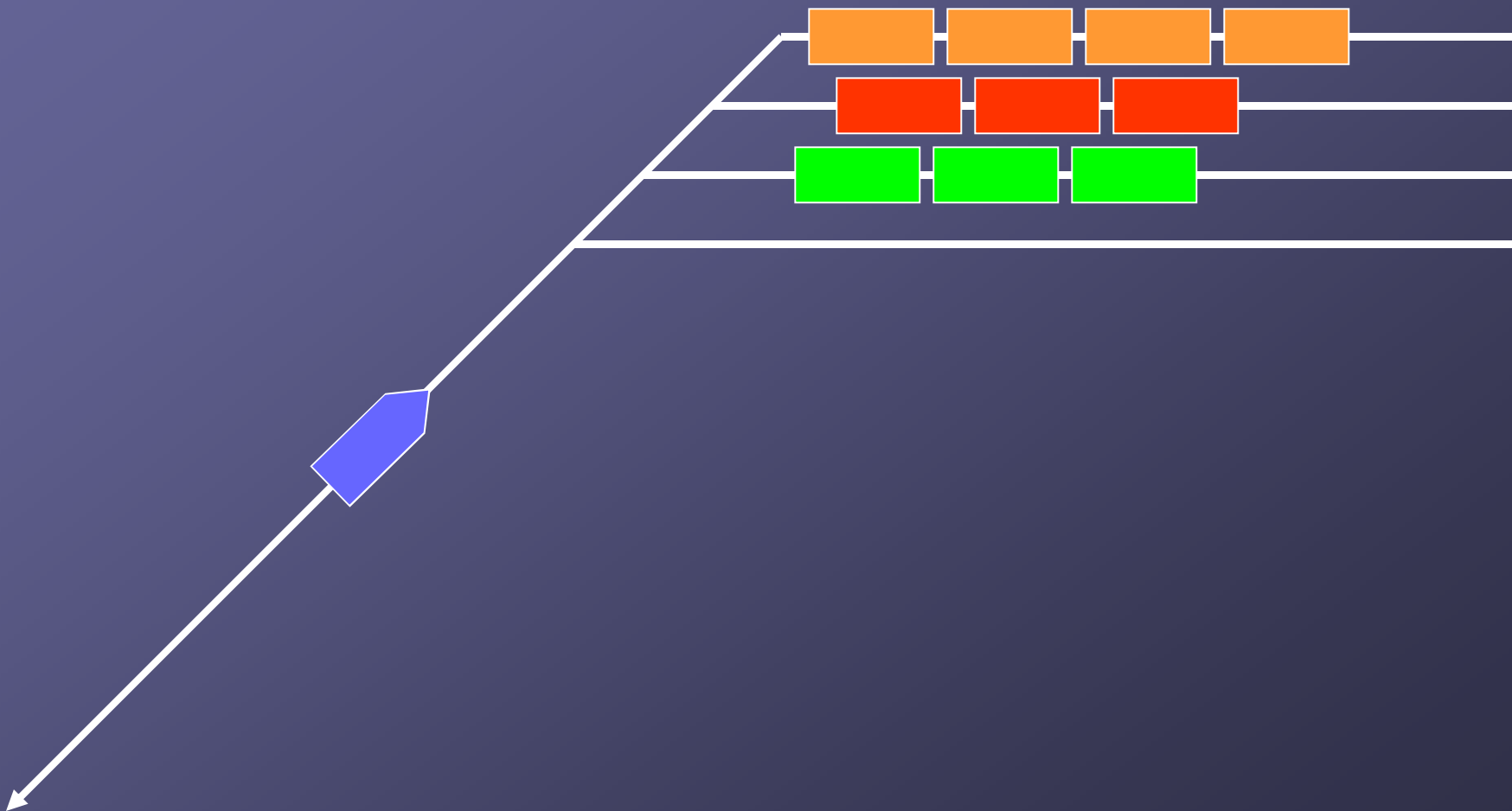
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PASSENGER TRAINS

PASSENGER SERVICE

While to some modelers passenger service seems uninteresting in comparison with freight trains, passenger trains offer unique features for operation.

- *Chair cars*
- *Head end cars*
- *Sleepers*
- *Mixed trains*

CHAIR CARS

Daytime routes generally call for trains with chair cars.

- *However, just because a passenger train is made up of chair cars does not mean that it cannot have some variety.*
- *A day train might pick up a milk car en route.*
- *Special passenger runs were sometimes arranged for sports or holiday activities.*

HEAD-END CARS

Head-end cars (so-called because they usually are ahead of passenger cars) add variety to passenger trains. Head-end cars usually fall into two types:

● *Express*

- *Larger terminals often included express buildings, where express cars were to be pulled or spotted.*
- *Express cars often were interchanged between connecting lines.*

● *Mail*

- *Mail bags were picked up or dropped at stations.*
- *In RPO Cars, postal workers sorted mail en route.*

SLEEPERS

Longer routes that required passengers to ride at night might include sleeper cars.

- *Sleeper cars might be in the consist for the entire run, or they might be picked up at some intermediate station along the way.*
- *Setting out or picking up a sleeper car can add variety and interest to passenger operations.*

MIXED TRAINS

Mixed trains carry both freight cars and passengers.

- *Some Timetables will specify that a freight train will carry passengers.*
- *Mixed trains typically are found on smaller branch lines.*
- *Usually, coaches in mixed trains are positioned at the rear of the consist.*



GUEST ETIQUETTE

TIPS TO REMEMBER

- *Arrive on time, but not unduly early.*
- *Turn off your cell phone.*
- *It is not your railroad, but you should treat it with the same care as if it were!*
- *Don't fix things; however, you may call the owner's attention to things that need fixed.*
- *Look with your eyes, not your fingers!*

FINAL TIPS

- *If something malfunctions, notify the host.*
- *If you don't know how something works, ASK, don't experiment.*
- *Don't take photos without permission.*
- *Keep food and drinks OFF the layout.*
- *Thank your host before departing.*

above all

HAVE FUN!

*That's all,
folks!*