# Automated Ideal Clusters

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| --- | --- | --- |
| Description |  | Cluster |
| KM + similarity matrix formed using FastText trained on home automation Wikipedia corpora |  | K=19 [['class reminder',  'minimum required amount of time',  'potential health concern',  'team goal'],  ['control comfort',  'control over temperature',  'radio system',  'remote control opener',  'temperature sensor'],  ['background music',  'biorhythm app',  'ir bracelet',  'mobile phone',  'push notification',  'remote location',  'socket adapter',  'text message',  'video camera',  'video feed',  'voice command',  'wireless charger'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['blind', 'window', 'window fan'],  ['appliance', 'electricity', 'lighting', 'thermostat'],  ['home sport experience',  'integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['device', 'sensor', 'window sensor'],  ['automated food bowl',  'automated music system',  'automated sharp furniture sensor',  'automatic fragrance sprinkler',  'automatic garage door opener'],  ['auto sprinkler',  'breakfast food',  'dangerous gas',  'manually vacuum',  'monitor my energy use',  'plant soil',  'registered occupant',  'regular furnace',  'vacuum cleaner'],  ['certain light',  'christmas light',  'garage door',  'room lighting',  'weather alert',  'weather outside'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart thermostat',  'smart phone'],  ['app', 'environment', 'remote', 'robot', 'tablet', 'television'],  ['desired temperature',  'ideal temperature',  'optimal',  'optimal condition',  'optimal temperature'],  ['ac',  'call',  'emergency',  'nfc',  'police',  'recommendation',  'sync',  'text'],  ['alarm',  'buzz',  'door',  'doorbell',  'intruder',  'lock',  'music',  'notification',  'shade',  'shock',  'shower',  'sound',  'tv'],  ['cooler', 'heater', 'oven', 'sink', 'stove', 'stovetop', 'toaster'],  ['air conditioning',  'air purity controller',  'air quality',  'bad odour',  'ceiling fan',  'ductless heat pump',  'energy efficient',  'heat source',  'pet water container',  'space heater']] K=28 [['blind', 'environment', 'optimal', 'recommendation', 'robot', 'tablet'],  ['biorhythm app',  'device',  'mobile phone',  'radio system',  'video camera',  'video feed',  'wireless charger'],  ['appliance', 'cooler', 'oven', 'stove', 'stovetop', 'thermostat', 'toaster'],  ['auto sprinkler',  'bad odour',  'dangerous gas',  'ir bracelet',  'manually vacuum',  'plant soil',  'registered occupant',  'regular furnace',  'socket adapter',  'team goal',  'vacuum cleaner',  'voice command'],  ['ceiling fan', 'heater', 'space heater'],  ['smart appliance', 'smart thermostat'],  ['alarm',  'app',  'call',  'doorbell',  'notification',  'push notification',  'sound',  'text'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['breakfast food'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['certain light',  'christmas light',  'control comfort',  'lighting',  'room lighting'],  ['class reminder', 'home sport experience', 'text message'],  ['window', 'window fan', 'window sensor'],  ['background music', 'music', 'tv'],  ['smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart phone'],  ['ac', 'electricity', 'emergency', 'police', 'sync', 'television'],  ['automated food bowl',  'automated music system',  'automatic fragrance sprinkler'],  ['automated sharp furniture sensor'],  ['air conditioning',  'air purity controller',  'air quality',  'ductless heat pump',  'heat source',  'optimal condition'],  ['buzz', 'intruder', 'lock', 'nfc', 'shade', 'shock', 'shower', 'sink'],  ['weather alert', 'weather outside'],  ['sensor'],  ['energy efficient',  'minimum required amount of time',  'monitor my energy use',  'pet water container',  'potential health concern'],  ['control over temperature',  'desired temperature',  'ideal temperature',  'optimal temperature',  'temperature sensor'],  ['smart carbon monoxide detector'],  ['carbon monoxide', 'carbon monoxide detector'],  ['door', 'garage door', 'remote', 'remote location'],  ['automatic garage door opener', 'remote control opener']] K=41  [['auto sprinkler',  'bad odour',  'breakfast food',  'dangerous gas',  'plant soil',  'regular furnace'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['vacuum cleaner'],  ['sensor', 'window sensor'],  ['air conditioning',  'air purity controller',  'air quality',  'ductless heat pump',  'optimal condition'],  ['cooler', 'oven', 'stove'],  ['call', 'police', 'tablet', 'text'],  ['smart thermostat'],  ['automated food bowl',  'automated music system',  'automated sharp furniture sensor'],  ['lock'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['device', 'mobile phone', 'radio system'],  ['buzz', 'shock', 'shower', 'stovetop', 'toaster'],  ['doorbell', 'intruder'],  ['automatic fragrance sprinkler',  'automatic garage door opener',  'garage door',  'remote control opener'],  ['heat source', 'heater', 'pet water container', 'space heater'],  ['certain light',  'christmas light',  'control comfort',  'lighting',  'room lighting'],  ['manually vacuum'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart phone'],  ['home sport experience', 'weather alert', 'weather outside'],  ['window', 'window fan'],  ['notification', 'push notification'],  ['appliance', 'electricity', 'energy efficient', 'thermostat'],  ['optimal', 'sink'],  ['door', 'remote'],  ['text message', 'voice command'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['ac', 'blind', 'nfc', 'shade', 'sync'],  ['video camera', 'video feed'],  ['app'],  ['background music', 'music', 'tv'],  ['minimum required amount of time',  'monitor my energy use',  'potential health concern'],  ['team goal'],  ['ceiling fan'],  ['ir bracelet',  'registered occupant',  'remote location',  'socket adapter',  'wireless charger'],  ['biorhythm app'],  ['class reminder'],  ['ideal temperature'],  ['control over temperature',  'desired temperature',  'optimal temperature',  'temperature sensor'],  ['alarm', 'emergency', 'recommendation', 'sound', 'television'],  ['environment', 'robot']] |
| EM + similarity matrix formed using FastText trained on home automation Wikipedia corpora |  | K=19 [['bad odour',  'ceiling fan',  'class reminder',  'manually vacuum',  'registered occupant',  'regular furnace',  'vacuum cleaner'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart thermostat',  'smart phone'],  ['certain light',  'christmas light',  'control comfort',  'garage door',  'room lighting',  'weather alert',  'weather outside'],  ['alarm',  'buzz',  'call',  'door',  'doorbell',  'intruder',  'lighting',  'lock',  'music',  'notification',  'police',  'remote',  'robot',  'sound',  'tablet',  'television',  'tv'],  ['automated food bowl',  'automated music system',  'automated sharp furniture sensor',  'breakfast food',  'minimum required amount of time',  'monitor my energy use',  'pet water container',  'potential health concern'],  ['control over temperature',  'desired temperature',  'energy efficient',  'heat source',  'ideal temperature',  'optimal temperature',  'temperature sensor'],  ['ac',  'blind',  'cooler',  'emergency',  'environment',  'nfc',  'optimal',  'recommendation',  'shade',  'shock',  'shower',  'sync'],  ['app', 'background music', 'biorhythm app'],  ['electricity', 'heater', 'sink', 'space heater', 'thermostat'],  ['ir bracelet',  'radio system',  'remote location',  'socket adapter',  'team goal',  'wireless charger'],  ['appliance', 'oven', 'stove', 'stovetop', 'toaster'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['mobile phone', 'video camera', 'video feed', 'window fan', 'window sensor'],  ['device', 'sensor', 'window'],  ['push notification', 'text', 'text message', 'voice command'],  ['auto sprinkler',  'automatic fragrance sprinkler',  'automatic garage door opener',  'home sport experience',  'remote control opener'],  ['air conditioning',  'air purity controller',  'air quality',  'dangerous gas',  'ductless heat pump',  'optimal condition',  'plant soil']] K=38 [['automated sharp furniture sensor'],  ['app', 'call', 'sync', 'tablet'],  ['home sport experience', 'monitor my energy use'],  ['smart lock'],  ['biorhythm app', 'device', 'mobile phone', 'radio system', 'video camera'],  ['buzz', 'intruder', 'shock', 'shower', 'toaster'],  ['ductless heat pump', 'heat source', 'pet water container'],  ['automatic garage door opener', 'control comfort', 'remote control opener'],  ['push notification', 'video feed', 'voice command'],  ['certain light', 'christmas light', 'room lighting'],  ['blind', 'lighting', 'shade'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['ceiling fan', 'manually vacuum', 'vacuum cleaner'],  ['appliance', 'electricity', 'energy efficient', 'thermostat'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart shower',  'smart thermostat',  'smart phone'],  ['alarm', 'notification', 'sound'],  ['optimal', 'optimal condition'],  ['air conditioning', 'air purity controller', 'air quality'],  ['bad odour',  'dangerous gas',  'plant soil',  'registered occupant',  'regular furnace',  'space heater'],  ['sensor', 'window sensor'],  ['door', 'doorbell', 'garage door', 'lock'],  ['breakfast food', 'weather alert', 'weather outside'],  ['environment', 'robot'],  ['automated music system', 'background music', 'music'],  ['control over temperature',  'desired temperature',  'ideal temperature',  'optimal temperature',  'temperature sensor'],  ['television', 'tv'],  ['auto sprinkler', 'automated food bowl', 'automatic fragrance sprinkler'],  ['cooler', 'sink'],  ['smart touch screen tv'],  ['remote', 'remote location'],  ['heater', 'oven', 'stove', 'stovetop'],  ['minimum required amount of time', 'potential health concern'],  ['class reminder',  'ir bracelet',  'socket adapter',  'team goal',  'wireless charger'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart watch application'],  ['ac', 'emergency', 'nfc', 'police', 'recommendation'],  ['window', 'window fan'],  ['text', 'text message']] K=48 [['smart carbon monoxide detector'],  ['energy efficient', 'monitor my energy use'],  ['oven', 'stove', 'stovetop'],  ['alarm', 'door', 'doorbell', 'intruder'],  ['smart thermostat'],  ['automated food bowl', 'automated sharp furniture sensor', 'breakfast food'],  ['text', 'text message', 'voice command'],  ['video camera', 'video feed'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['control comfort', 'radio system'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['bad odour',  'dangerous gas',  'plant soil',  'registered occupant',  'regular furnace'],  ['blind', 'nfc', 'shade', 'sync'],  ['certain light', 'christmas light', 'room lighting'],  ['control over temperature',  'desired temperature',  'ideal temperature',  'optimal temperature',  'temperature sensor'],  ['optimal', 'optimal condition'],  ['sensor'],  ['automated music system', 'background music', 'music'],  ['class reminder', 'team goal'],  ['emergency', 'police'],  ['buzz', 'shock', 'shower', 'toaster'],  ['ir bracelet', 'socket adapter', 'wireless charger'],  ['heater', 'space heater'],  ['weather alert', 'weather outside'],  ['minimum required amount of time'],  ['manually vacuum', 'vacuum cleaner'],  ['notification', 'push notification', 'sound'],  ['ceiling fan', 'window', 'window fan', 'window sensor'],  ['environment', 'robot'],  ['air conditioning', 'air purity controller', 'air quality'],  ['auto sprinkler', 'automatic fragrance sprinkler', 'home sport experience'],  ['device', 'mobile phone'],  ['ac'],  ['cooler', 'sink'],  ['lighting'],  ['potential health concern'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart phone'],  ['ductless heat pump', 'heat source', 'pet water container'],  ['automatic garage door opener', 'garage door'],  ['television', 'tv'],  ['app', 'biorhythm app'],  ['remote', 'remote control opener', 'remote location'],  ['electricity', 'thermostat'],  ['call', 'tablet'],  ['recommendation'],  ['lock'],  ['appliance'],  ['carbon monoxide', 'carbon monoxide detector']] |
| KM + similarity matrix formed using pertained wikinews FastText |  | K= 18 [['door', 'doorbell', 'lock', 'sink', 'window'],  ['auto sprinkler',  'ceiling fan',  'garage door',  'manually vacuum',  'registered occupant',  'socket adapter',  'window fan',  'wireless charger'],  ['buzz',  'electricity',  'environment',  'lighting',  'music',  'optimal',  'remote',  'shade',  'sound'],  ['ac', 'nfc'],  ['desired temperature',  'ideal temperature',  'optimal temperature',  'space heater',  'temperature sensor',  'window sensor'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['air purity controller',  'control over temperature',  'ductless heat pump',  'home sport experience',  'minimum required amount of time',  'monitor my energy use',  'pet water container',  'potential health concern',  'remote control opener'],  ['background music',  'biorhythm app',  'breakfast food',  'class reminder',  'push notification',  'radio system',  'team goal',  'text message',  'video camera',  'video feed',  'voice command'],  ['smart feature', 'smart lock'],  ['ir bracelet', 'television', 'tv'],  ['alarm',  'blind',  'call',  'emergency',  'intruder',  'notification',  'police',  'recommendation',  'shock',  'shower'],  ['air conditioning',  'air quality',  'control comfort',  'dangerous gas',  'energy efficient',  'heat source',  'optimal condition',  'plant soil',  'regular furnace',  'remote location',  'vacuum cleaner',  'weather alert',  'weather outside'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['bad odour', 'certain light', 'christmas light', 'room lighting'],  ['mobile phone',  'smart appliance',  'smart device',  'smart home',  'smart shower',  'smart thermostat',  'smart phone'],  ['automated food bowl',  'automated music system',  'automated sharp furniture sensor',  'automatic fragrance sprinkler',  'automatic garage door opener',  'hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['appliance',  'cooler',  'heater',  'oven',  'stove',  'stovetop',  'thermostat',  'toaster'],  ['app', 'device', 'robot', 'sensor', 'sync', 'tablet', 'text']] K=35 [['toaster'],  ['ceiling fan', 'socket adapter', 'window fan', 'wireless charger'],  ['bad odour'],  ['music', 'television', 'tv'],  ['electricity', 'emergency', 'environment', 'lighting', 'police', 'remote'],  ['class reminder', 'push notification', 'team goal', 'text message'],  ['app'],  ['cooler', 'heater', 'stove', 'stovetop'],  ['door', 'lock', 'shade', 'window'],  ['air purity controller',  'control over temperature',  'ductless heat pump',  'home sport experience',  'monitor my energy use',  'pet water container',  'potential health concern',  'remote control opener'],  ['oven', 'thermostat'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['automatic garage door opener',  'garage door',  'minimum required amount of time'],  ['shower', 'sink'],  ['ir bracelet', 'tablet', 'text'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['ac'],  ['device', 'robot', 'sensor'],  ['auto sprinkler',  'automated food bowl',  'automated music system',  'automated sharp furniture sensor',  'automatic fragrance sprinkler'],  ['desired temperature',  'ideal temperature',  'optimal temperature',  'temperature sensor'],  ['sync'],  ['doorbell', 'intruder'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart phone'],  ['smart thermostat'],  ['background music',  'biorhythm app',  'mobile phone',  'radio system',  'video camera',  'video feed',  'voice command'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['certain light',  'christmas light',  'remote location',  'room lighting',  'weather alert',  'weather outside',  'window sensor'],  ['alarm', 'blind', 'buzz', 'shock', 'sound'],  ['call', 'notification', 'recommendation'],  ['nfc'],  ['appliance'],  ['air conditioning',  'air quality',  'breakfast food',  'control comfort',  'heat source',  'plant soil',  'regular furnace',  'space heater',  'vacuum cleaner'],  ['manually vacuum', 'registered occupant'],  ['dangerous gas', 'energy efficient', 'optimal condition'],  ['optimal']] K=43 [['smart appliance', 'smart thermostat'],  ['call', 'notification'],  ['app', 'tablet'],  ['environment', 'optimal', 'sound'],  ['device', 'remote', 'sensor'],  ['door', 'doorbell', 'window'],  ['buzz', 'sync'],  ['alarm', 'blind', 'intruder', 'robot'],  ['text message'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['desired temperature',  'ideal temperature',  'optimal condition',  'optimal temperature'],  ['music', 'television', 'tv'],  ['background music'],  ['text'],  ['carbon monoxide'],  ['bad odour',  'dangerous gas',  'manually vacuum',  'regular furnace',  'vacuum cleaner'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['energy efficient'],  ['carbon monoxide detector', 'smart carbon monoxide detector'],  ['ac', 'nfc'],  ['lighting', 'shade', 'shower'],  ['automatic garage door opener'],  ['cooler'],  ['registered occupant', 'socket adapter', 'team goal'],  ['smart device', 'smart feature', 'smart home', 'smart lock', 'smart phone'],  ['plant soil',  'remote location',  'room lighting',  'weather alert',  'weather outside'],  ['electricity', 'emergency', 'police', 'shock'],  ['auto sprinkler',  'biorhythm app',  'mobile phone',  'radio system',  'video camera',  'video feed',  'voice command',  'wireless charger'],  ['air conditioning',  'air quality',  'control comfort',  'control over temperature',  'remote control opener'],  ['class reminder'],  ['ceiling fan', 'garage door', 'window fan', 'window sensor'],  ['heat source', 'space heater', 'temperature sensor'],  ['oven', 'stovetop', 'toaster'],  ['certain light', 'christmas light'],  ['recommendation'],  ['thermostat'],  ['air purity controller',  'automated food bowl',  'automated music system',  'automatic fragrance sprinkler',  'breakfast food',  'ductless heat pump',  'home sport experience',  'pet water container',  'potential health concern'],  ['appliance', 'heater', 'stove'],  ['ir bracelet'],  ['smart shower'],  ['automated sharp furniture sensor',  'minimum required amount of time',  'monitor my energy use'],  ['push notification'],  ['lock', 'sink']] |
| EM + similarity matrix formed using pertained wikinews FastText |  | K=19 [['background music',  'biorhythm app',  'class reminder',  'mobile phone',  'push notification',  'radio system',  'registered occupant',  'socket adapter',  'team goal',  'text message',  'video camera',  'video feed',  'voice command',  'wireless charger'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['ac', 'nfc'],  ['desired temperature',  'ideal temperature',  'optimal condition',  'optimal temperature',  'temperature sensor'],  ['alarm',  'blind',  'call',  'emergency',  'notification',  'police',  'recommendation',  'shock',  'shower',  'sink',  'sound'],  ['electricity', 'environment', 'lighting', 'optimal', 'shade'],  ['door', 'doorbell', 'intruder', 'lock', 'remote', 'window'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart thermostat',  'smart phone'],  ['appliance', 'device', 'robot', 'sensor', 'tablet', 'television'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart touch screen tv',  'smart watch application'],  ['auto sprinkler', 'ceiling fan', 'garage door', 'window fan'],  ['automated sharp furniture sensor',  'automatic fragrance sprinkler',  'automatic garage door opener',  'minimum required amount of time'],  ['air purity controller',  'breakfast food',  'manually vacuum',  'plant soil',  'vacuum cleaner'],  ['regular furnace', 'space heater', 'window sensor'],  ['bad odour',  'certain light',  'christmas light',  'dangerous gas',  'energy efficient',  'heat source',  'remote location',  'room lighting',  'weather alert',  'weather outside'],  ['air conditioning', 'air quality', 'control comfort'],  ['app', 'buzz', 'ir bracelet', 'music', 'sync', 'text', 'tv'],  ['automated food bowl',  'automated music system',  'control over temperature',  'ductless heat pump',  'hallway motion detector',  'home sport experience',  'monitor my energy use',  'outdoor motion detector',  'outdoor motion sensor',  'pet water container',  'potential health concern',  'remote control opener'],  ['cooler', 'heater', 'oven', 'stove', 'stovetop', 'thermostat', 'toaster']] K=37 [['app', 'device'],  ['electricity',  'emergency',  'environment',  'music',  'optimal',  'remote',  'sound'],  ['heater'],  ['sync', 'tablet', 'text'],  ['class reminder',  'push notification',  'text message',  'voice command',  'weather alert'],  ['automated sharp furniture sensor'],  ['door', 'lock', 'window'],  ['control over temperature', 'remote control opener'],  ['cooler', 'lighting', 'shade'],  ['garage door', 'window fan', 'window sensor'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['minimum required amount of time'],  ['ir bracelet'],  ['smart breakfast appliance', 'smart coffee machine'],  ['stove', 'stovetop'],  ['robot', 'sensor'],  ['appliance', 'toaster'],  ['call', 'notification', 'recommendation'],  ['thermostat'],  ['ac', 'nfc'],  ['hallway motion detector',  'outdoor motion detector',  'outdoor motion sensor'],  ['integrated smart electronics',  'smart touch screen tv',  'smart watch application'],  ['home sport experience',  'monitor my energy use',  'potential health concern'],  ['background music',  'bad odour',  'breakfast food',  'certain light',  'christmas light',  'control comfort',  'dangerous gas',  'energy efficient',  'heat source',  'regular furnace',  'remote location',  'room lighting',  'weather outside'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart thermostat',  'smart phone'],  ['oven'],  ['doorbell'],  ['alarm', 'blind', 'buzz', 'shock', 'shower', 'sink'],  ['manually vacuum', 'registered occupant', 'team goal'],  ['space heater', 'temperature sensor'],  ['television', 'tv'],  ['auto sprinkler',  'biorhythm app',  'mobile phone',  'radio system',  'socket adapter',  'video camera',  'video feed',  'wireless charger'],  ['intruder', 'police'],  ['ceiling fan'],  ['desired temperature',  'ideal temperature',  'optimal condition',  'optimal temperature'],  ['air conditioning',  'air purity controller',  'air quality',  'plant soil',  'vacuum cleaner'],  ['automated food bowl',  'automated music system',  'automatic fragrance sprinkler',  'automatic garage door opener',  'ductless heat pump',  'pet water container']] K=54 [['environment', 'remote'],  ['alarm', 'blind', 'buzz', 'shock'],  ['electricity', 'lighting'],  ['automated sharp furniture sensor', 'monitor my energy use'],  ['integrated smart electronics',  'smart breakfast appliance',  'smart coffee machine',  'smart watch application'],  ['desired temperature', 'ideal temperature', 'optimal temperature'],  ['music', 'television'],  ['oven', 'stove', 'stovetop', 'toaster'],  ['biorhythm app'],  ['automated music system'],  ['sound'],  ['air conditioning', 'air quality', 'control comfort', 'dangerous gas'],  ['weather alert'],  ['cooler', 'shade'],  ['smart appliance',  'smart device',  'smart feature',  'smart home',  'smart lock',  'smart shower',  'smart thermostat',  'smart phone'],  ['heater', 'thermostat'],  ['push notification'],  ['remote location', 'weather outside'],  ['smart touch screen tv'],  ['background music', 'radio system', 'video camera', 'video feed'],  ['minimum required amount of time'],  ['doorbell', 'intruder'],  ['emergency', 'police'],  ['ductless heat pump',  'home sport experience',  'pet water container',  'potential health concern'],  ['tv'],  ['mobile phone'],  ['appliance'],  ['bad odour', 'energy efficient', 'optimal condition'],  ['optimal'],  ['carbon monoxide',  'carbon monoxide detector',  'smart carbon monoxide detector'],  ['app', 'sync', 'tablet', 'text'],  ['nfc'],  ['shower', 'sink'],  ['class reminder', 'text message', 'voice command'],  ['socket adapter'],  ['ceiling fan', 'garage door', 'window fan', 'window sensor'],  ['manually vacuum', 'plant soil', 'vacuum cleaner'],  ['robot', 'sensor'],  ['ir bracelet'],  ['outdoor motion sensor'],  ['call', 'notification', 'recommendation'],  ['air purity controller',  'control over temperature',  'remote control opener'],  ['device'],  ['certain light', 'christmas light'],  ['auto sprinkler', 'wireless charger'],  ['registered occupant', 'team goal'],  ['ac'],  ['hallway motion detector', 'outdoor motion detector'],  ['automatic garage door opener'],  ['door', 'window'],  ['heat source', 'temperature sensor'],  ['lock'],  ['automated food bowl', 'automatic fragrance sprinkler', 'breakfast food'],  ['regular furnace', 'room lighting', 'space heater']] |